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Consists of 361 Pages

SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

Form 19b-4

Proposed Rules

By

Public Company Accounting Oversight Board

In accordance with Rule 19b-4 under the
Securities Exchange Act of 1934

1. Text of the Proposed Rules

(a) Pursuant to the provisions of Section 107(b) of the Sarbanes-Oxley Act of 2002 (the "Act"), the Public Company Accounting Oversight Board (the "Board" or the "PCAOB") is filing with the Securities and Exchange Commission ("SEC" or "Commission") amendments to three PCAOB auditing standards that it adopted as described in the release entitled *Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (the "proposed rules"). The proposed rules are attached as Exhibit A to this rule filing. In addition, the Board is also requesting the SEC's approval, pursuant to Section 103(a)(3)(c) of the Act, of the application of the proposed rules to audits of emerging growth companies ("EGCs"), as that term is defined in Section 3(a)(80) of the Securities Exchange Act of 1934. Section 104 of the Jumpstart Our Business Startups Act provides that any additional rules adopted by the Board subsequent to April 5, 2012, do not apply to the audits of EGCs unless the SEC "determines that the application of such additional requirements is necessary or appropriate in the public interest, after considering the protection of investors, and whether the action will promote efficiency, competition, and capital formation." See Exhibit 3.

(b) Not applicable; the proposed rules would not rescind or supersede any Board standards.

(c) Not applicable.

2. Procedures of the Board

(a) The Board approved the proposed rules, and authorized them for filing with the SEC, at its open meeting on June 12, 2024. No other action by the Board is necessary for the filing of the proposed rules.

(b) Questions regarding this rule filing may be directed to Barbara Vanich, Chief Auditor (202/207-9363, vanichb@pcaobus.org); Dima Andriyenko, Deputy Chief Auditor (202/207-9130, andriyenkod@pcaobus.org); Dominika Taraszkievicz, Senior Associate Chief Auditor, Office of the Chief Auditor (202/591-4143, taraszkieviczd@pcaobus.org); Hunter Jones, Chief Counsel (202/591-4412, jonesh@pcaobus.org); or Connor Raso, Deputy General Counsel (202/591-4478, rasoc@pcaobus.org).

3. Board's Statement of the Purpose of, and the Statutory Basis for, the Proposed Rules Change

(a) Purpose

The Board adopted amendments to AS 1105, *Audit Evidence*, and to AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and conforming amendments to AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements* (collectively, the "amendments" or "final amendments"). The amendments are designed to improve audit quality and enhance investor protection by addressing the growing use of certain technology in audits.

In particular, the amendments update PCAOB auditing standards to more specifically address certain aspects of designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools (i.e., technology-assisted analysis). The amendments are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report.

Information from the PCAOB's research project on *Data and Technology* indicates that some auditors are expanding their use of technology-assisted analysis (often referred to in practice as "data analysis" or "data analytics") in the audit. Auditors use technology-assisted

analysis in many different ways, including when responding to significant risks of material misstatement to the financial statements. For example, some auditors use technology-assisted analysis to examine the correlation between different types of transactions, compare company information to auditor-developed expectations or third-party information, or recalculate company information.

Existing PCAOB standards discuss certain fundamental auditor responsibilities, including addressing the risks of material misstatement to the financial statements by obtaining sufficient appropriate audit evidence. However, the standards do not specifically address certain aspects of using technology-assisted analysis in the audit. If not designed and executed appropriately, audit procedures that involve technology-assisted analysis may not provide sufficient appropriate audit evidence as required by the standards.

Having considered the expanded use of technology-assisted analysis by auditors, the Board proposed amendments in June 2023 to address certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Commenters generally supported the objective of improving audit quality and enhancing investor protection by clarifying and strengthening requirements in AS 1105 and AS 2301 related to certain aspects of designing and performing audit procedures that involve technology-assisted analysis. In adopting these final amendments, the Board took into account the comments received.

The amendments further specify and clarify certain auditor responsibilities that are described in AS 1105 and AS 2301. The amendments are focused on addressing certain aspects of technology-assisted analysis, not specific matters relating to other technology applications used in audits (e.g., blockchain or artificial intelligence) or the evaluation of the appropriateness of tools under the firm's system of quality control. The amendments are principles-based and

therefore intended to be adaptable to the evolving nature of technology. In particular, the amendments:

- Specify considerations for the auditor's investigation of items identified when performing tests of details;
- Specify that if the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure;
- Specify auditor responsibilities for evaluating the reliability of external information provided by the company in electronic form and used as audit evidence;
- Emphasize the importance of controls over information technology;
- Clarify the description of a "test of details";
- Emphasize the importance of appropriate disaggregation or detail of information to the relevance of audit evidence; and
- Update certain terminology in AS 1105 to reflect the greater availability of information in electronic form and improve the consistency of the use of such terminology throughout the standard.

The amendments will apply to all audits conducted under PCAOB standards. Subject to approval by the U.S. Securities and Exchange Commission ("SEC"), the amendments will take effect for audits of financial statements for fiscal years beginning on or after December 15, 2025.

See Exhibit 1 and Exhibit 3 for additional discussion of the purpose of this project.

(b) Statutory Basis

The statutory basis for the proposed rules is Title I of the Act.

4. Board's Statement on Burden on Competition

Not applicable. The Board's consideration of the economic impacts of the standard and amendments is discussed in Exhibit 1 and in Exhibit 3.

5. Board's Statement on Comments on the Proposed Rules Change Received from Members, Participants or Others

The Board initially released the proposed rules for public comment on June 26, 2023. *See* Exhibit 2(a)(A). The Board received 21 written comment letters relating to its initial proposed rules. *See* Exhibits 2(a)(B) and 2(a)(C).

6. Extension of Time Period for Commission Action

The Board does not consent to an extension of the time period specified in Section 19(b)(2) of the Securities Exchange Act of 1934.

7. Basis for Summary Effectiveness Pursuant to Section 19(b)(3) or for Accelerated Effectiveness Pursuant to Section 19(b)(2)

Not applicable.

8. Proposed Rules Based on Rules of Another Board or of the Commission

Not applicable.

9. Exhibits

Exhibit A – Text of the Proposed Rules.

Exhibit 1 – Form of Notice of Proposed Rules for Publication in the *Federal Register*.

Exhibit 2(a)(A) – PCAOB Release No. 2023-004 (Proposing Release).

Exhibit 2(a)(B) – Alphabetical List of Comments on the Rules Proposed in PCAOB Release No. 2023-004.


Exhibit 2(a)(C) – Written Comments on the Rules Proposed in PCAOB Release No. 2023-004.

Exhibit 3 – PCAOB Release No. 2024-007 (Adopting Release).

10. Signatures

Pursuant to the requirements of the Act and the Securities Exchange Act of 1934, as amended, the Board has duly caused this filing to be signed on its behalf by the undersigned thereunto duly authorized.

Public Company Accounting Oversight Board

By: 
Phoebe W. Brown
Secretary

June 20, 2024

EXHIBIT A – TEXT OF THE PROPOSED RULES

The Board adopted amendments to AS 1105, *Audit Evidence*, and to AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and conforming amendments to AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements* (collectively, the "amendments" or "final amendments"). The text of the amendments is set forth below.

Amendments to AS 1105, *Audit Evidence*

I. AS 1105 is amended by revising paragraph .07 to read as follows:

.07 *Relevance*. The relevance of audit evidence refers to its relationship to the assertion or to the objective of the control being tested. The relevance of audit evidence depends on:

- a. The design of the audit procedure used to test the assertion or control, in particular whether it is designed to (1) test the assertion or control directly and (2) test for understatement or overstatement;
- b. The timing of the audit procedure used to test the assertion or control; and
- c. The level of disaggregation or detail of information necessary to achieve the objective of the audit procedure.

II. AS 1105 is amended by revising paragraph .08 to read as follows:

.08 *Reliability*. The reliability of evidence depends on the nature and source of the evidence and the circumstances under which it is obtained. In general:

- Evidence obtained from a knowledgeable source that is independent of the company is more reliable than evidence obtained only from internal company sources.

Note: *See* Appendix A of this standard for requirements related to the evaluation of evidence from a company's specialist.

- Information produced by the company and information that the company received from one or more external sources in electronic form are more reliable when the company's controls over that information including, where applicable, its information technology general controls and automated application controls, are effective.
- Evidence obtained directly by the auditor is more reliable than evidence obtained indirectly.
- Evidence provided by original documents is more reliable than evidence provided by photocopies or facsimiles, or documents that have been filmed, digitized, or otherwise converted into electronic form, the reliability of which depends on the controls over the conversion and maintenance of those documents.

Note: If a third party provides evidence to an auditor subject to restrictions, limitations, or disclaimers, the auditor should evaluate the effect of the restrictions, limitations, or disclaimers on the reliability of that evidence.

III. AS 1105 is amended by revising paragraph .10 and adding footnote 3A to paragraph .10, to read as follows:

.10 When using information produced by the company as audit evidence, the auditor should evaluate whether the information is sufficient and appropriate for purposes of the audit by performing procedures to:³

- Test the accuracy and completeness of the information, or test the controls over the accuracy and completeness of that information, including, where applicable, information technology general controls and automated application controls;^{3A} and
- Evaluate whether the information is sufficiently precise and detailed for purposes of the audit.

³ When using the work of a company's specialist, *see* Appendix A of this standard.

When using information produced by a service organization or a service auditor's report as audit evidence, *see* AS 2601, *Consideration of an Entity's Use of a Service Organization*, and for integrated audits, *see* AS 2201, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*.

^{3A} For situations involving information in electronic form, *see* paragraph .17 of AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*.

IV. AS 1105 is amended by adding, after paragraph .10, a new subheading, and new paragraph .10A and footnote 3B:

Evaluating the Reliability of External Information Provided by the Company in Electronic Form

.10A The company may provide to the auditor information in electronic form that the company received from one or more external sources.^{3B} When using such information as audit evidence, the auditor should evaluate whether the information is reliable for purposes of the audit by:

a. Obtaining an understanding of (i) the source from which the company received the information; and (ii) the company's process by which such information was received,

maintained, and, where applicable, processed, which includes understanding the nature of any modifications made to the information before it was provided to the auditor; and

b. Testing the information to determine whether it has been modified by the company and evaluating the effect of those modifications; or testing controls over receiving, maintaining, and processing the information (including, where applicable, information technology general controls and automated application controls).

^{3B} Such information includes, for example, cash receipts, shipping documents, and purchase orders.

V. AS 1105 is amended by revising footnote 7 to paragraph .13 to read as follows:

⁷ AS 2301.

VI. AS 1105 is amended by revising paragraph .14 and adding footnote 7A to paragraph .14 to read as follows:

.14 Paragraphs .15-.21 of this standard describe specific audit procedures. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure. If the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure.^{7A}

^{7A} AS 2110 establishes requirements regarding the process of identifying and assessing risks of material misstatements of the financial statements. AS 2301 establishes requirements regarding designing and implementing appropriate responses to the risks of material misstatement, including tests of controls and substantive procedures.

VII. AS 1105 is amended by revising paragraph .15 and adding footnote 7B to paragraph .15, to read as follows:

.15 Inspection involves examining information, whether internal or external, in paper form, electronic form, or other media, or physically examining an asset. Inspection of information provides audit evidence of varying degrees of reliability, depending on the nature and source of the information and the circumstances under which the information is obtained.^{7B} An example of inspection used as a test of controls is inspection of records for evidence of authorization.

^{7B} See paragraph .08 of this standard.

VIII. AS 1105 is amended by revising paragraph .19 to read as follows:

.19 Recalculation consists of checking the mathematical accuracy of information.

IX. AS 1105 is amended by revising footnote 5 to paragraph .A8 to read as follows:

⁵ See paragraphs .07, .08, and .10A of this standard.

Amendments to AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*

X. AS 2301 is amended by revising paragraph .10 to read as follows:

.10 The audit procedures performed in response to the assessed risks of material misstatement can be classified into two categories: (1) tests of controls and (2) substantive procedures.⁹ Paragraphs .16-.35 of this standard discuss tests of controls, and paragraphs .36-.46 and .48-.50 discuss substantive procedures.

Note: Paragraphs .16-.17 of this standard discuss when tests of controls are necessary in a financial statement audit. Ordinarily, tests of controls are performed for relevant assertions for which the auditor chooses to rely on controls to modify his or her substantive procedures.

⁹ Substantive procedures consist of (a) tests of details of accounts and disclosures and (b) substantive analytical procedures.

XI. AS 2301 is amended by adding, after paragraph .47, a new subheading, and new paragraphs .48-.50 to read as follows:

Test of Details

.48 A test of details involves performing audit procedures with respect to items included in an account or disclosure (e.g., the date, amount, or contractual terms of a transaction). When performing a test of details, the auditor should apply audit procedures that are appropriate to the particular audit objectives to each item selected for testing.²¹

²¹ AS 1105 describes the alternative means of selecting items for testing: selecting all items, selecting specific items, and audit sampling. *See* AS 1105.22-.28.

.49 When performing a test of details, the auditor may identify items that require further investigation.²² Audit procedures that the auditor performs to investigate the identified items are part of the auditor's response to risks of material misstatement. The auditor determines the nature, timing, and extent of such procedures in accordance with PCAOB standards.²³ The auditor's investigation of the identified items should include determining whether these items individually or in the aggregate indicate (i) misstatements that should be evaluated in accordance with AS 2810, *Evaluating Audit Results*, or (ii) deficiencies in the company's internal control over financial reporting.²⁴

²² For example, an auditor may identify balances or transactions that contain a certain characteristic or that are valued outside of a range.

²³ *See, e.g.*, AS 2315, which describes the auditor's responsibilities for evaluating sampling results when tests of details involve audit sampling, and paragraph .50 of this standard when tests of details involve specific items selected for testing.

²⁴ In an integrated audit of financial statements and internal control over financial reporting, the auditor should perform the evaluation in accordance with AS 2201. In an audit of financial statements only, the auditor should follow the direction of AS 2201.62-.70, as stated in AS 1305.03.

.50 When the auditor selects specific items²⁵ within an account or disclosure for testing, the auditor should determine whether there is a reasonable possibility that remaining items within the account or disclosure include a misstatement that, individually or when aggregated with others, would have a material effect on the financial statements.²⁶ If the auditor determines that there is a reasonable possibility of such a risk of material misstatement in the items not selected for testing, the auditor should perform substantive procedures that address the assessed risk.²⁷

²⁵ *See* AS 1105.25-.27.

²⁶ *See* AS 2110.

²⁷ *See* paragraphs .08 and .36 of this standard.

Conforming Amendments to AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements*

XII. AS 2501 is amended by revising paragraph .12 to read as follows:

.12 AS 1105 requires the auditor, when using information produced by the company as audit evidence, to evaluate whether the information is sufficient and appropriate for purposes of the audit by performing procedures to (1) test the accuracy and completeness of the information or test the controls over the accuracy and completeness of that information including, where applicable, information technology general controls and automated application controls, and (2) evaluate whether the information is sufficiently precise and detailed for purposes of the audit.¹³

¹³ See AS 1105.10.

XIII. AS 2501 is amended by revising footnote 14 to paragraph .13 to read as follows:

¹⁴ See AS 1105.07, .08, and .10A. Appendix B of AS 1105 describes the auditor's responsibilities for obtaining sufficient appropriate audit evidence in situations in which the valuation of an investment is based on the investee's financial results.

EXHIBIT 1

SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-XXXXX; File No. PCAOB-2024-03)

[Date]

Public Company Accounting Oversight Board; Notice of Filing of Proposed Rules on Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Pursuant to Section 107(b) of the Sarbanes-Oxley Act of 2002 ("Sarbanes-Oxley," or the "Act"), notice is hereby given that on [Date of Form 19b-4 Submission], the Public Company Accounting Oversight Board (the "Board" or the "PCAOB") filed with the Securities and Exchange Commission (the "Commission" or the "SEC") the proposed rules described in items I and II below, which items have been prepared by the Board. The Commission is publishing this notice to solicit comments on the proposed rules from interested persons.

I. Board's Statement of the Terms of Substance of the Proposed Rules

On June 12, 2024, the Board adopted *Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* ("proposed rules"). The text of the proposed rules appears in Exhibit A to the SEC Filing Form 19b-4 and is available on the Board's website at <https://pcaobus.org/about/rules-rulemaking/rulemaking-dockets/docket-052> and at the Commission's Public Reference Room.

II. Board's Statement of the Purpose of, and Statutory Basis for, the Proposed Rules

In its filing with the Commission, the Board included statements concerning the purpose of, and basis for, the proposed rules and discussed any comments it received on the proposed

rules. The text of these statements may be examined at the places specified in Item IV below.

The Board prepared summaries, set forth in sections A, B, and C below, of the most significant aspects of such statements. In addition, the Board is requesting that the Commission approve the proposed rules, pursuant to Section 103(a)(3)(C) of the Act, for application to audits of emerging growth companies ("EGCs"), as that term is defined in Section 3(a)(80) of the Securities Exchange Act of 1934 ("Exchange Act"). The Board's request is set forth in section D.

A. Board's Statement of the Purpose of, and Statutory Basis for, the Proposed Rules

(a) Purpose

The Board adopted amendments to AS 1105, *Audit Evidence*, and to AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and conforming amendments to another PCAOB auditing standard (collectively, the "amendments" or "final amendments"). The amendments are designed to improve audit quality and enhance investor protection by addressing the growing use of certain technology in audits.

In particular, the amendments update PCAOB auditing standards to more specifically address certain aspects of designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools (i.e., technology-assisted analysis). The amendments are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report.

Information from the PCAOB's research project on *Data and Technology* indicates that some auditors are expanding their use of technology-assisted analysis (often referred to in practice as "data analysis" or "data analytics") in the audit. Auditors use technology-assisted analysis in many different ways, including when responding to significant risks of material

misstatement to the financial statements. For example, some auditors use technology-assisted analysis to examine the correlation between different types of transactions, compare company information to auditor-developed expectations or third-party information, or recalculate company information.

Existing PCAOB standards discuss certain fundamental auditor responsibilities, including addressing the risks of material misstatement to the financial statements by obtaining sufficient appropriate audit evidence. However, the standards do not specifically address certain aspects of using technology-assisted analysis in the audit. If not designed and executed appropriately, audit procedures that involve technology-assisted analysis may not provide sufficient appropriate audit evidence as required by the standards.

Having considered the expanded use of technology-assisted analysis by auditors, the Board proposed amendments in June 2023 to address certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Commenters generally supported the objective of improving audit quality and enhancing investor protection by clarifying and strengthening requirements in AS 1105 and AS 2301 related to certain aspects of designing and performing audit procedures that involve technology-assisted analysis. In adopting the final amendments, the Board took into account the comments received.

The amendments further specify and clarify certain auditor responsibilities that are described in AS 1105 and AS 2301. The amendments are focused on addressing certain aspects of technology-assisted analysis, not specific matters relating to other technology applications used in audits (e.g., blockchain or artificial intelligence) or the evaluation of the appropriateness of tools under the firm's system of quality control. The amendments are principles-based and

therefore intended to be adaptable to the evolving nature of technology. In particular, the amendments:

- Specify considerations for the auditor's investigation of items identified when performing tests of details;
- Specify that if the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure;
- Specify auditor responsibilities for evaluating the reliability of external information provided by the company in electronic form and used as audit evidence;
- Emphasize the importance of controls over information technology;
- Clarify the description of a "test of details";
- Emphasize the importance of appropriate disaggregation or detail of information to the relevance of audit evidence; and
- Update certain terminology in AS 1105 to reflect the greater availability of information in electronic form and improve the consistency of the use of such terminology throughout the standard.

The amendments will apply to all audits conducted under PCAOB standards. Subject to approval by the SEC, the amendments will take effect for audits of financial statements for fiscal years beginning on or after December 15, 2025.

See Exhibit 3 for additional discussion of the purpose of this project.

(b) Statutory Basis

The statutory basis for the proposed rules is Title I of the Act.

B. Board's Statement on Burden on Competition

Not applicable. The Board's consideration of the economic impacts of the proposed rules is discussed in section D below.

C. Board's Statement on Comments on the Proposed Rules Received from Members, Participants or Others

The Board initially released the proposed rules for public comment in PCAOB Release No. 2023-004 (June 26, 2023). The Board received 21 written comment letters relating to its initial proposed rules. *See* Exhibits 2(a)(B) and 2(a)(C). The Board has carefully considered all comments received. The Board's response to the comments it received, and the changes it made to the rules in response to the comments received, are discussed below.

BACKGROUND

In 2010, the Board adopted auditing standards related to the auditor's assessment of and response to risk (the "risk assessment standards"), including AS 1105 and AS 2301. Although the risk assessment standards were designed to apply to audits when auditors use information technology, the use of information in electronic form¹ and the use of technology-based tools² by companies and their auditors to analyze such information has expanded significantly since these standards were adopted.

¹ In this document, the term "information in electronic form" encompasses items in electronic form that are described in PCAOB standards using terms such as "information," "data," "documents," "records," "accounting records," and "company's financial records."

² In this release, the term "tool" refers to specialized software that is used on audit engagements to examine, sort, filter, and analyze transactions and information used as audit evidence or which otherwise generates information that aids auditor judgment in the performance of audit procedures. Spreadsheet software itself without specific programming is not inherently a tool, but a spreadsheet may be built to perform the functions of a tool (examining, sorting, filtering, etc.), in which case it is included within the scope of this term. The PCAOB staff's analysis was limited to tools classified or described by the firms as data analytic tools. Tools may be either purchased by a firm or developed by a firm.

In light of the increased use of technology by companies and auditors, in 2017 the Board began a research project to assess the need for guidance, changes to PCAOB standards, or other regulatory actions.³ Through this research the Board found that auditors have expanded their use of certain technology-based tools, including tools used to perform technology-assisted analysis (as described above, also referred to in practice as "data analytics" or "data analysis"⁴), to plan and perform audits. While the Board's research indicated that auditors are using technology-assisted analysis to obtain audit evidence, it also indicated that existing PCAOB standards could address more specifically certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Consequently, under existing standards, there is a greater risk that when using technology-assisted analysis in designing and performing audit procedures, auditors may fail to obtain sufficient appropriate evidence in the audit.

The amendments in this release are intended to improve audit quality through principles-based requirements that apply to all audits conducted under PCAOB standards. They are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report. The remainder of this section of the release provides an overview of the rulemaking history, existing requirements, and current practice. In addition, it discusses reasons to improve the existing standards.

Rulemaking History

³ See PCAOB's *Data and Technology* research project, available at <https://pcaobus.org/oversight/standards/standard-setting-research-projects/data-technology>.

⁴ In this release, the terms "data analysis" or "data analytics" are used synonymously.

In June 2023, the Board proposed to amend AS 1105 and AS 2301 to address aspects of designing and performing audit procedures that involve technology-assisted analysis and that the Board's research indicated are not specified in existing PCAOB standards.⁵ The proposed amendments were informed by the staff's research regarding auditors' use of technology, as described above.

The proposed amendments: (i) specified considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive audit procedures; (ii) specified that if an auditor uses audit evidence from an audit procedure for more than one purpose the procedure needs to be designed and performed to achieve each of the relevant objectives; (iii) provided additional details regarding auditor responsibilities for evaluating the reliability of external information maintained by the company in electronic form and used as audit evidence; (iv) clarified the differences between "tests of details" and "analytical procedures," and emphasized the importance of appropriate disaggregation or detail of information to the relevance of audit evidence; and (v) updated certain terminology in AS 1105 to reflect the greater availability of information in electronic form and improve the consistency of the use of such terminology throughout the standard.

The Board received 21 comment letters on the proposal. Commenters included an investor-related group, registered public accounting firms ("firms"), firm-related groups, academics, and others. The Board considered all comments in developing the final amendments, and specific comments are discussed in the analysis that follows. Commenters generally supported the Board's efforts to modernize the auditing standards to specifically address certain

⁵ *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*, PCAOB Rel. No. 2023-004 (June 26, 2023) ("proposal" or "proposing release").

aspects of designing and performing audit procedures that involve technology-assisted analysis, and some commenters offered suggestions to improve and clarify the proposed amendments.

Existing Requirements

The final amendments modify certain requirements of PCAOB standards relating to audit evidence and responses to risk (AS 1105 and AS 2301). AS 1105 explains what constitutes audit evidence and establishes requirements regarding designing and performing audit procedures to obtain sufficient appropriate audit evidence. AS 2301 establishes requirements regarding designing and implementing appropriate responses to identified and assessed risks of material misstatement.

The following discussion provides a high-level overview of the areas of the PCAOB standards that the amendments address. The discussion further below provides additional details regarding the specific requirements that the Board amended.

Classification of Audit Procedures (See Figure 1 below) – Under PCAOB standards, audit procedures can be classified into either risk assessment procedures or further audit procedures, which consist of tests of controls and substantive procedures. Substantive procedures include tests of details and substantive analytical procedures.⁶ Existing standards provide examples of specific audit procedures⁷ and describe what constitutes a substantive analytical procedure,⁸ but do not describe what constitutes a test of details. PCAOB standards do not preclude the auditor from designing and performing audit procedures to accomplish more than

⁶ See AS 1105.13.

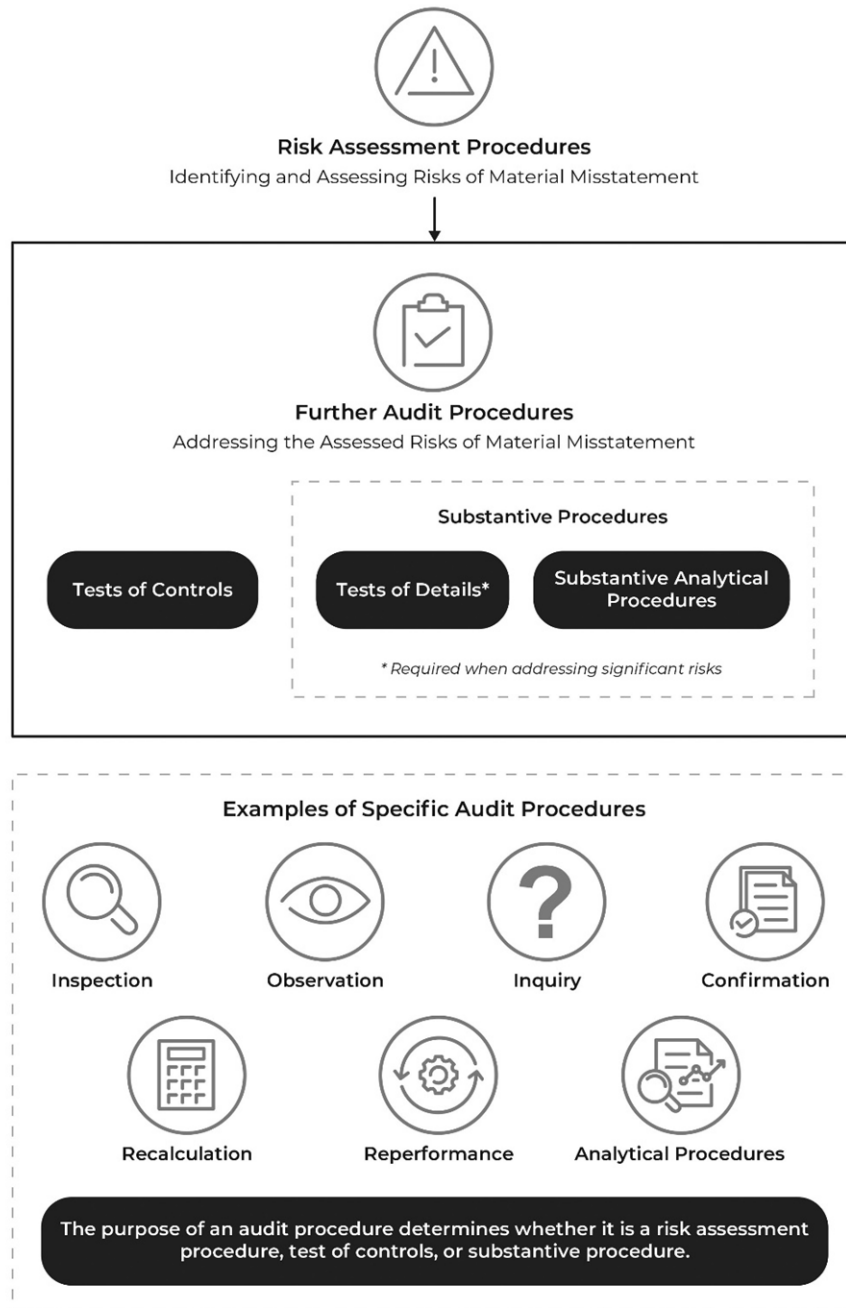
⁷ See AS 1105.15-.21.

⁸ See AS 2305, *Substantive Analytical Procedures*.

one purpose. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.⁹

Figure 1. Classification of Audit Procedures

⁹ See AS 1105.14.



Items Identified for Investigation in a Test of Details – Designing substantive tests of details and tests of controls includes determining the means of selecting items for testing. Under existing standards, the alternative means of selecting items for testing include selecting specific items, selecting a sample that is expected to be representative of the population (i.e., audit

sampling), or selecting all items. The auditor may decide to select for testing specific items within a population because they are important to accomplishing the objective of the audit procedure or because they exhibit some other characteristic.¹⁰ Existing PCAOB standards specify the auditor's responsibilities for planning, performing, and evaluating an audit sample,¹¹ but do not specify the auditor's responsibilities for addressing items identified when performing a test of details on specific items, or all items, within a population.

Relevance and Reliability of Audit Evidence – Under PCAOB standards, audit evidence is all the information, whether obtained from audit procedures or other sources, that is used by the auditor in arriving at the conclusions on which the auditor's opinion is based.¹² PCAOB standards require the auditor to plan and perform audit procedures to obtain sufficient appropriate audit evidence to provide a reasonable basis for their audit opinion. Sufficiency is the measure of the quantity of audit evidence, and appropriateness is the measure of its quality. To be appropriate, audit evidence must be both relevant and reliable in providing support for the auditor's conclusions.¹³

The relevance of audit evidence depends on the design and timing of the audit procedure. The reliability of audit evidence depends on the nature and source of the evidence and the circumstances under which it is obtained, such as whether the information is provided to the auditor by the company being audited and whether the company's controls over that information are effective.¹⁴ In addition, when using information produced by the company as audit evidence,

¹⁰ See AS 1105.22-.27.

¹¹ See AS 2315, *Audit Sampling*.

¹² See AS 1105.02.

¹³ See AS 1105.04-.06.

¹⁴ See AS 1105.07-.08.

the auditor is responsible for evaluating whether the information is sufficient and appropriate for purposes of the audit.¹⁵ Existing PCAOB standards do not specify auditor responsibilities regarding information the company received from one or more external sources and provided in electronic form to the auditor to use as audit evidence.

Current Practice

The Board's research indicated that audit procedures involving technology-assisted analysis are an important component of many audits. The use of technology-assisted analysis has expanded over the last decade as more accounting firms, including smaller firms, incorporate such analysis as part of their audit procedures. However, the investment in and use of technology-assisted analysis vary across registered firms and across individual audit engagements within a firm.¹⁶

The greater availability of both information in electronic form and technology-based tools to analyze such information has contributed significantly to the increase in the use of technology-assisted analysis by auditors. More companies use enterprise resource planning ("ERP") and other information systems that maintain large volumes of information in electronic form, including information generated internally by the company and information that the company receives from external sources. Significant volumes of this information are available to auditors for use in performing audit procedures.

Powerful technology-based tools that process and analyze large volumes of information have become more readily available to auditors. As a result, auditors sometimes apply technology-assisted analysis to the entire population of transactions within one or more financial

¹⁵ See AS 1105.10.

¹⁶ See also further discussion below.

statement accounts or disclosures. The Board's research indicated that auditors primarily use technology-assisted analysis to identify and assess risks of material misstatement. Technology-assisted analysis enables the auditor to identify new risks or to refine the assessment of known risks. For example, by analyzing a full population of revenue transactions, an auditor may identify certain components of the revenue account as subject to higher risks or may identify new risks of material misstatement associated with sales to a particular customer or in a particular location.

Increasingly, some auditors also have been using technology-assisted analysis in audit procedures that respond to assessed risks of material misstatement, including in substantive procedures. For example, such analysis has been used to test the details of all items in a population, assist the auditor in selecting specific items for testing based on auditor-developed criteria, or identify items for further investigation when performing a test of details. The staff has observed that auditors' use of technology-assisted analysis occurs mostly in the testing of revenue and related receivable accounts, inventory, journal entries, expected credit losses, and investments.¹⁷ As discussed below, some auditors use audit evidence obtained from such analysis to achieve more than one purpose.

Audit methodologies of several firms affiliated with global networks address the use of technology-assisted analysis by the firms' audit engagement teams. For example, the methodologies specify audit engagement teams' responsibilities for: (i) designing and performing audit procedures that involve technology-assisted analysis (e.g., determining whether an audit procedure is a substantive procedure); (ii) evaluating analysis results (e.g., whether identified

¹⁷ See PCAOB, *Spotlight: Staff Update and Preview of 2021 Inspection Observations* (Dec. 2022), at 15, available at https://pcaob-assets.azureedge.net/pcaob-dev/docs/default-source/documents/staff-preview-2021-inspection-observations-spotlight.pdf?sfvrsn=d2590627_2/.

items indicate misstatements or whether performing additional procedures is necessary to obtain sufficient appropriate audit evidence); and (iii) evaluating the relevance and reliability of information used in the analysis.

Commenters on the proposal generally agreed with the description of the current audit practice and the auditor's use of technology-assisted analysis. One of these commenters noted that, in addition , auditors can also use technology-assisted analysis to help understand a company's flow of transactions, especially given increases in the number and complexities of a company's information systems.

Reasons to Improve the Auditing Standards

The amendments in this release are intended to improve audit quality through principles-based requirements that apply to all audits.

1. Areas of Improvement

The amendments are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report. Observations from the PCAOB's *Data and Technology* research project indicate that some auditors are using technology-assisted analysis in audit procedures whereas others may be reluctant to do so due to perceived regulatory uncertainty. The research further suggests that clarifications to PCAOB standards could more specifically address certain aspects of designing and performing audit procedures that involve technology-assisted analysis. The Board's Investor Advisory Group has also noted that auditors' use of technology-assisted analysis

is an area of concern due to auditors' potential overreliance on company-produced information, and that addressing the use of such analysis in the standards could be beneficial.¹⁸

Using technology-assisted analysis may enhance the effectiveness of audit procedures. For example, analyzing larger volumes of information and in more depth may better inform the auditor's risk assessment by providing different perspectives, providing more information when assessing risks, and exposing previously unidentified relationships that may reveal new risks. At the same time, inappropriate application of PCAOB standards when designing and performing audit procedures that involve technology-assisted analysis has the potential to compromise the quality of audits where the procedures are used. For example, PCAOB oversight activities have found instances of noncompliance with PCAOB standards related to evaluating the relevance and reliability of company-provided information and evaluating certain items identified in audit procedures involving technology-assisted analysis.¹⁹

The amendments to existing PCAOB standards in this release address aspects of designing and performing audit procedures that involve technology-assisted analysis where the Board identified the need for additional specificity or clarity in the existing standards.²⁰ These aspects include areas where PCAOB oversight activities have identified instances of noncompliance with PCAOB standards and areas where auditors have raised questions during the Board's research regarding the applicability of PCAOB standards to the use of technology-

¹⁸ See Proposing Release at 12 for additional discussion of investors' concerns.

¹⁹ See, e.g., PCAOB, *Spotlight: Staff Update and Preview of 2020 Inspection Observations* (Oct. 2021), at 9, PCAOB, *Spotlight: Staff Update and Preview of 2021 Inspection Observations* (Dec. 2022), at 15, and PCAOB, *Spotlight: Staff Update and Preview of 2022 Inspection Observations* (July 2023), at 12, available at <https://pcaobus.org/resources/staff-publications>.

²⁰ Other PCAOB standard-setting projects may address other aspects of firms' and auditors' use of technology in performing audits. For example, see paragraphs .44h, .47h, and .51 of QC 1000, *A Firm's System of Quality Control*, PCAOB Rel. No. 2024-005 (May 13, 2024), which discusses a firm's responsibilities related to technological resources.

assisted analysis. The discussion below describes the amendments in more detail. The discussion further below describes alternatives that the Board considered.

2. Comments on the Reasons to Improve

Commenters generally supported the Board's efforts to modernize its auditing standards to specifically address aspects of designing and performing audit procedures that involve technology-assisted analysis. Several commenters highlighted that auditors' use of technologies, including technology-assisted analysis, continues to grow, and one of these commenters noted that the proposal is an important step forward to address this rapidly changing environment. An investor-related group stated that PCAOB standards should directly address auditors' use of technology and data, and that the proposed amendments to AS 1105 and AS 2301 were responsive to their concern about auditor overreliance on technology-assisted analysis.

Commenters also generally supported the principles-based nature of the proposed amendments and the Board's decision not to require the use of technology-assisted analysis. One commenter, for example, noted that audit procedures performed using technology-based tools may not always provide sufficient appropriate audit evidence. An investor-related group, however, recommended that the Board consider requiring auditors to use certain (but unspecified) types of technology-based tools that financial research and investment management firms have used to analyze financial statements. As discussed further below, requiring the use of technology would have been outside the scope of the project. The Board retained the principles-based nature of the proposed amendments within the final amendments, so that the standards are flexible and can adapt to the continued evolution of technology.

Several commenters stated that the Board should consider the effect of auditors' and companies' use of technology more broadly on the audit. One commenter stated that technology

will need to be an ongoing focus for the Board in its standard setting given the evolving nature of technology, and that broader change may be needed. This commenter also recommended a more holistic standard-setting approach that is interconnected with other PCAOB projects. Other commenters stated that as technology continues to evolve, the Board should continue to research and evaluate the need for standard setting related to other types of technology used in the audit, such as artificial intelligence. Academics emphasized the need for the PCAOB to be forward-thinking to regulate in this area.

As the Board stated in the proposal, these amendments address only one area of auditors' use of technology – certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Other areas continue to be analyzed as part of the Board's ongoing research activities. In addition, the Board's Technology Innovation Alliance Working Group continues to advise the Board on the use of emerging technologies by auditors and preparers relevant to audits and their potential impact on audit quality.²¹ These ongoing activities may inform future standard-setting projects.

Commenters also expressed a need for more guidance and illustrative examples. One of these commenters stated that additional explanatory materials or separate guidance could help maintain competition among firms. Another stated that insights from the PCAOB's research and oversight activities would benefit small and mid-sized accounting firms in identifying and selecting appropriate tools.

Throughout this release, where appropriate, the Board has incorporated examples and considerations for applying the final amendments. The examples and considerations highlight the

²¹ See *PCAOB Technology Innovation Alliance Working Group*, available at <https://pcaobus.org/about/working-groups-task-forces/technology-innovation-alliance-working-group>.

principles-based nature of the amendments and emphasize that the nature, timing, and extent of the auditor's procedures will depend on the facts and circumstances of the audit engagement. In addition, the staff's ongoing research activities will continue to evaluate the need for staff guidance.

DISCUSSION OF THE FINAL AMENDMENTS

Specifying Auditor Responsibilities When Performing Tests of Details

See paragraphs .10 and .48 through .50 of AS 2301 of the amendments.

1. Clarifying "Test of Details"

The Board proposed to amend AS 1105.13 and .21 to address the differences between the terms "test of details" and "analytical procedures," by clarifying the meaning of the term "test of details." The proposed amendments stated that a test of details involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures generally do not involve evaluating individual items, unless those items are part of the auditor's investigation of significant differences from expected amounts. The Board adopted the proposed description of a "test of details" with certain modifications as discussed further below, including relocating the description from AS 1105 to new paragraph .48 in AS 2301.

Under PCAOB standards, the auditor's responses to risks of material misstatement involve performing substantive procedures for each relevant assertion of each significant account and disclosure, regardless of the assessed level of control risk.²² Substantive procedures under PCAOB standards include tests of details and substantive analytical procedures.²³ Appropriately

²² See AS 2301.36.

²³ See AS 1105.13.b(2).

designing and performing an audit procedure to achieve a particular objective is key to appropriately addressing the risks assessed by the auditor. For significant risks of material misstatement, including fraud risks, the auditor is required to perform substantive procedures, including tests of details that are specifically responsive to the assessed risk.²⁴ PCAOB standards also state that it is unlikely that audit evidence obtained from substantive analytical procedures alone would be sufficient.²⁵

As discussed in the proposal, the use of "data analytics" or "data analysis" in practice and the use of the term "analytical procedures" in PCAOB standards have led to questions about whether an audit procedure involving technology-assisted analysis can be a test of details (i.e., not an analytical procedure as described under PCAOB standards). The distinction is important because of the requirement in PCAOB standards that the auditor perform tests of details when responding to an assessed significant risk of material misstatement. Relying on analytical procedures alone to address an assessed significant risk is not sufficient.

Commenters on this topic supported clarifying the meaning of tests of details and that tests of details involve performing audit procedures at an individual item level. However, several commenters stated that with technology-assisted analysis, aspects of a substantive analytical procedure may also be performed at an individual item level. Some commenters provided examples where the auditor uses a technology-assisted analysis to develop an expectation of recorded amounts for individual items in an account and aggregates the individual amounts to compare to the aggregated amount recorded by the company.

²⁴ See AS 2301.11 and .13 (specifying the auditor's responsibilities for responses to significant risks, which include fraud risks).

²⁵ See AS 2305.09.

One commenter suggested clarifying the term "individual items" given the varying forms and level of disaggregation of data obtained for analysis by the auditor. This commenter suggested further clarifying that consideration be given to the objective of the audit procedure, the nature of the procedure to be applied, and the evidence necessary to meet the objective of the audit procedure. Another commenter sought additional information related to circumstances where a procedure would not be considered a test of details because it was not applied to individual items in an account.

Some commenters, mostly firms, expressed a preference that the standards not compare tests of details to analytical procedures. For example:

- A firm-related group stated that the proposed clarification was unnecessarily nuanced.
- Another commenter stated that the proposed description of analytical procedures as compared to tests of details was not accurate and could cause confusion.
- Other commenters stated that analytical procedures are clearly defined in PCAOB standards and are well understood by auditors, and that comparing tests of details to analytical procedures is unnecessary.
- Some commenters suggested evaluating the proposed amendments together with the Board's standard-setting project to address substantive analytical procedures.

Other commenters stated that technology-assisted analysis continues to make classification of procedures between tests of details and analytical procedures more challenging because some procedures may exhibit characteristics of both types of procedures. These commenters suggested that the auditing standards focus on the sufficiency and appropriateness of evidence obtained from an audit procedure instead of clarifying the terminology of tests of

details and analytical procedures. Some commenters also stated that the development of an expectation differentiates an analytical procedure from a test of details.

Having considered the comments received, the Board made several changes to the proposed description of a "test of details." The final amendments state that a test of details involves performing audit procedures with respect to items included in an account or disclosure (e.g., the date, amount, or contractual terms of a transaction). When performing a test of details, the auditor should apply audit procedures that are appropriate to the particular audit objectives to each item selected for testing.

First, the Board relocated the description of a "test of details" and related requirements to a new section of AS 2301, in new paragraph .48. The Board believes that describing a test of details within AS 2301 is appropriate because tests of details are performed as substantive procedures to address assessed risks of material misstatement. The description uses the term "items included in an account or disclosure" instead of "individual items." The change in terminology was made to more closely align with the description of items selected for testing in existing AS 1105.22-.23.

Second, the Board revised the amendment to clarify that when performing a test of details, the auditor should apply the audit procedures that are appropriate to the particular audit objectives to each item selected for testing. This provision focuses the auditor on the objectives of the audit procedures being performed and is consistent with existing requirements for audit sampling.²⁶ The Board believes that an emphasis on the objectives of the audit procedures, regardless of the means of selecting items for testing in the test of details, continues to be

²⁶ See AS 2315.25.

important and is aligned with the final amendments to AS 1105.14 (using an audit procedure for more than one purpose), which are discussed below in this release.²⁷

Lastly, the final amendments do not compare tests of details to analytical procedures, and the Board did not amend the existing description of analytical procedures in AS 1105.21. Because of the overlap between the description of analytical procedures and substantive analytical procedures, further potential amendments to the description of analytical procedures are being considered as part of the Board's standard-setting project to address substantive analytical procedures.²⁸ In addition, comments the Board received related to the auditor's use of substantive analytical procedures were taken into consideration in that project.

The final amendments are not intended to define "items included in an account or disclosure" because such a definition is impractical given the variety of accounts and disclosures subject to tests of details. The auditor would determine the level of disaggregation or detail of the items within the account or disclosure based on the facts and circumstances of the audit engagement, including the assessed risk and the relevant assertion intended to be addressed, and the objective of the procedure.

In addition, the Board considered the comments suggesting that the amendments focus on the sufficiency and appropriateness of evidence obtained from performing audit procedures instead of describing categories of procedures. Considering current practice and the nature of

²⁷ See discussion below.

²⁸ The Board has a separate standard-setting project on its short-term standard-setting agenda (<https://pcaobus.org/oversight/standards/standard-setting-research-projects>) related to substantive analytical procedures. In connection with that project, the Board has proposed changes to the auditor's responsibilities regarding the use of substantive analytical procedures, including the requirements described in AS 2305 and AS 1105. See *Proposed Auditing Standard – Designing and Performing Substantive Analytical Procedures and Amendments to Other PCAOB Standards*, PCAOB Rel. No. 2024-006 (June 12, 2024) (included in PCAOB Rulemaking Docket No. 56).

audit procedures performed currently, the Board continues to believe that the existing standards are sufficiently clear in describing auditors' responsibilities for obtaining and evaluating audit evidence. The Board's ongoing research has not identified specific examples of substantive analytical procedures that, by themselves, would provide sufficient appropriate audit evidence to respond to a significant risk. Commenters also did not provide such examples. Therefore, the Board believes retaining the categories of procedures as tests of details and substantive analytical procedures continues to be appropriate.

2. Specifying Auditor Responsibilities When Investigating Items Identified

The Board proposed to add a new paragraph .37A to AS 2301 that specified matters for the auditor to consider when investigating items identified through using criteria established by the auditor in designing or performing substantive procedures on all or part of a population of items. Under the proposed paragraph, when the auditor establishes and uses criteria to identify items for further investigation, as part of designing or performing substantive procedures, the auditor's investigation should consider whether the identified items:

- Provide audit evidence that contradicts the evidence upon which the original risk assessment was based;
- Indicate a previously unidentified risk of material misstatement;
- Represent a misstatement or indicate a deficiency in the design or operating effectiveness of a control; or
- Otherwise indicate a need to modify the auditor's risk assessment or planned audit procedures.

The proposed requirement included a note providing that inquiry of management may assist the auditor and that the auditor should obtain audit evidence to evaluate the appropriateness of management's responses.

The Board adopted the proposed provisions with certain modifications as discussed further below, including relocating the requirements from proposed paragraph .37A to new paragraphs .49 and .50 in AS 2301. The Board also made a conforming amendment to paragraph .10 of AS 2301 to include a reference to paragraphs .48 through .50.

As discussed above, designing substantive tests of details and tests of controls includes determining the means of selecting items for testing. The alternative means of selecting items for testing consist of selecting all items; selecting specific items; and audit sampling. As discussed in the proposal, the Board's research has indicated that auditors use technology-assisted analysis to identify specific items within a population (e.g., an account or class of transactions) for further investigation. For example, auditors may identify all revenue transactions above a certain amount, transactions processed by certain individuals, or transactions where the shipping date does not match the date of the invoice. Because technology-assisted analysis may enable the auditor to examine all items in a population, it is possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor.

Considering current practice, the Board stated in the proposal that PCAOB standards should be modified to address the auditor's responsibilities in such scenarios more directly. The auditor's appropriate investigation of identified items is important both for identifying and assessing the risks of material misstatement and for designing and implementing appropriate responses to the identified risks.

Commenters were supportive of the principles-based nature of the proposed amendment and agreed with the Board's decision not to prescribe the nature, timing, or extent of investigation procedures. However, commenters also asked for further clarification, guidance, and examples to address different scenarios that the auditor encounters when 100 percent of a population is tested, given that certain requirements in proposed AS 2301.37A exist in the standards today. Some commenters said it was unclear how proposed AS 2301.37A was different from requirements in existing standards related to the auditor's ongoing risk assessment, and the auditor's responsibility to revise their risk assessment under certain scenarios and to evaluate the results of audit procedures. Several commenters noted that existing standards address auditors' responsibilities when investigating items under certain scenarios. These commenters observed, for example, that AS 2110, *Identifying and Assessing Risks of Material Misstatement*, applies when the auditor uses technology-assisted analysis to identify and assess risks of material misstatement, and AS 2110.74 and AS 2301.46 apply when the items identified by the auditor when using technology-assisted analysis indicate a new risk of misstatement or a need to modify the auditor's risk assessment. One commenter asked whether identifying items for further investigation was intended to describe only scenarios where specific items are selected for testing.

One commenter noted that the proposed amendment implied that technology-assisted analysis could be used only for purposes of risk assessment or selecting specific items for testing. Another commenter stated that it is important for the auditor's investigation of items to include determining whether there is a control deficiency.

Several commenters asked that the Board clarify whether sampling can be applied to items identified for investigation or whether the auditor is expected to test 100 percent of the

identified items. Some commenters also asked the Board to clarify whether the evidence obtained would be considered sufficient and appropriate, or if the auditor would be required to perform further procedures, in situations where a technology-assisted analysis over an entire population (e.g., matching quantities invoiced to quantities shipped) did not identify any items for investigation. One commenter recommended that the amendments be extended to address the auditor's responsibilities over other items in the population not identified for investigation. Two commenters asked the Board to clarify how the proposed amendment and existing standard would apply when the technology-assisted analysis is modified after the original analysis is complete.

Consistent with the proposal, the final requirements are principles-based and intended to be applied to all means of selecting items for a test of details (e.g., selecting all items, selecting specific items, and audit sampling). The Board continues to believe that appropriately addressing the items identified by the auditor for further investigation in a test of details is an important part of obtaining sufficient appropriate audit evidence, because these items individually or in the aggregate may indicate misstatements or deficiencies in the design or operating effectiveness of a control. In response to comments received, the final amendments reflect several modifications from the proposal.

First, the Board reframed the requirements to focus on the auditor's investigation of items when performing a test of details as part of the auditor's response to assessed risks. The Board narrowed the requirement to apply only to tests of details because, as commenters noted, existing PCAOB standards describe the auditor's responsibility to investigate items identified when

performing substantive analytical procedures.²⁹ In addition, the Board did not repeat the considerations related to the auditor's risk assessment that are required under existing PCAOB standards as described above. The Board believes these changes alleviate potential confusion about how the requirements are intended to be applied. The Board also removed the proposed note requiring the auditor to obtain audit evidence when evaluating the appropriateness of management's responses to inquiries, because existing PCAOB standards already address this point by noting that inquiry alone does not provide sufficient appropriate evidence to support a conclusion about a relevant assertion.³⁰

Second, the requirements have been relocated into two new paragraphs (.49 and .50) in AS 2301, which are designed to work together. Paragraph .49 applies to all tests of details, regardless of the means of selecting items used by the auditor. The requirement states that when performing a test of details, the auditor may identify items for further investigation. For example, an auditor may identify balances or transactions that contain, or do not contain, a certain characteristic or that are valued outside of a range. The final amendment emphasizes that when such items are identified, audit procedures that the auditor performs to investigate the identified items are part of the auditor's response to the risks of material misstatement. The auditor determines the nature, timing, and extent of such procedures in accordance with PCAOB standards. The final amendment also provides that the auditor's investigation of the identified items should include determining whether the items individually or in the aggregate indicate (i)

²⁹ See AS 2305.20-.21 (providing that the auditor should evaluate significant unexpected differences when performing a substantive analytical procedure). See also PCAOB Rel. No. 2024-006 (proposing amendments to AS 2305).

³⁰ See AS 1105.17 and AS 2301.39.

misstatements that should be evaluated in accordance with AS 2810 or (ii) deficiencies in the company's internal control over financial reporting.

When the auditor identifies items for further investigation in a test of details, the final amendment does not prescribe the nature, timing, and extent of audit procedures to be performed regarding the identified items, including whether those procedures are performed on the items individually or in the aggregate. Prescribing specific procedures would be impracticable considering the multitude of possible scenarios encountered in practice. The nature of the identified items and likely sources of potential misstatements are examples of factors that would inform the auditor's approach. To comply with PCAOB standards, the nature, timing, and extent of the audit procedures performed, including the means of selecting items, should enable the auditor to obtain evidence that, in combination with other relevant evidence, is sufficient to meet the objective of the test of details.

In some cases, an auditor may be able to group the identified items (e.g., items with a common characteristic) and perform additional audit procedures to determine whether the items indicate misstatements or control deficiencies by group.³¹ In other cases, it may not be appropriate to group the items identified for investigation.³² Further, the auditor's investigation could also identify new relevant information (e.g., regarding the types of potential misstatements) and the auditor may need to modify the audit response.

³¹ For example, in a test of revenue, the auditor may discover that the identified differences between customer invoices and payments are caused by variations in the exchange rate, but such differences are both in accordance with the terms of the customer contracts and appropriately accounted for by the company. In this example, grouping the differences for the purpose of performing additional procedures may be appropriate.

³² For example, in circumstances where the identified items are unrelated to each other, it may not be appropriate for the auditor to group these items for the purpose of performing additional procedures.

When a test of details is performed on specific items selected by the auditor,³³ the final amendments discuss the auditor's responsibilities for addressing the remaining items in the population. When the auditor selects specific items in an account or disclosure for testing, new paragraph .50 provides that the auditor should determine whether there is a reasonable possibility that remaining items within the account or disclosure include a misstatement that, individually or when aggregated with others, would have a material effect on the financial statements.³⁴ If the auditor determines that there is a reasonable possibility of such a risk of material misstatement in the items not selected for testing, the auditor should perform substantive procedures that address the assessed risk.³⁵ As discussed in the proposing release, the auditor's responsibilities over other items in the population are described in existing PCAOB standards, and the final requirement (AS 2301.50) reminds the auditor of those responsibilities.

The final amendments do not specify, as suggested by some commenters, whether the evidence obtained would be considered sufficient and appropriate, or whether the auditor would be required to perform further procedures, in situations where a technology-assisted analysis over an entire population did not identify any items for investigation. Because facts and circumstances vary, it is not possible to specify scenarios that would provide sufficient appropriate audit evidence. Consistent with existing standards, for an individual assertion, different types and combinations of substantive procedures might be necessary to detect material misstatements in the respective assertions.³⁶ For example, in addition to performing a technology-assisted analysis of company-produced information to match quantities invoiced to

³³ See AS 1105.25-.27.

³⁴ See AS 2110.

³⁵ See AS 2301.08 and .36.

³⁶ See AS 2301.40.

quantities shipped, other audit procedures, such as examining a sample of information that the company received from external sources (e.g., purchase orders and cash receipts), may be necessary to obtain sufficient appropriate audit evidence for the relevant assertion. The auditor would be required to document the purpose, objectives, evidence obtained, and conclusions reached from the procedures in accordance with the existing provisions of AS 1215, *Audit Documentation*.³⁷

Specifying Auditor Responsibilities When Using an Audit Procedure for More Than One Purpose

See paragraph .14 of AS 1105 of the amendments.

The Board proposed to amend paragraph .14 of AS 1105 by adding a sentence to specify that if an auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure to achieve each of the relevant objectives of the procedure.

The proposed amendment was intended to supplement existing PCAOB standards because the Board's research indicated that: (i) technology-assisted analysis could be used in a variety of audit procedures, including risk assessment and further audit procedures (such as tests of details and substantive analytical procedures); (ii) an audit procedure that involves technology-assisted analysis may provide relevant and reliable evidence for more than one purpose (e.g., identifying and assessing risks of material misstatement and addressing assessed risks); and (iii) questions have been raised about whether the evidence obtained from an audit procedure that involves technology-assisted analysis can be used for more than one purpose. The Board adopted the amendment substantially as proposed, with certain modifications to clarify

³⁷ See AS 1215.04-.06.

and simplify the sentence, as discussed below. As amended, the sentence added to paragraph .14 provides that "[i]f the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure."

Under existing PCAOB standards, the purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.³⁸ Although AS 1105 describes specific audit procedures, it does not specify whether an audit procedure may be designed to achieve more than one purpose; nor does it preclude the auditor from designing and performing multi-purpose audit procedures.³⁹ In fact, other PCAOB standards have long permitted auditors to use audit evidence for more than one purpose through the performance of properly designed "dual-purpose" procedures in certain scenarios.⁴⁰

Considering the variety of applications of technology-assisted analysis throughout the audit, the Board stated in the proposal that PCAOB standards could be modified to more specifically address when an auditor uses audit evidence from an audit procedure for more than one purpose, to facilitate the auditor's design and performance of audit procedures that provide sufficient appropriate audit evidence. The proposal explained that audit procedures involving technology-assisted analysis are not always multi-purpose procedures. For example, a technology-assisted analysis that is used to analyze a population of revenue transactions to identify significant new products may provide audit evidence only to assist the auditor with

³⁸ See AS 1105.14.

³⁹ This interpretation was highlighted in a 2020 PCAOB staff publication. See PCAOB, *Spotlight: Data and Technology Research Project Update* (May 2020), at 4, available at <https://pcaobus.org/Documents/Data-Technology-Project-Spotlight.pdf>.

⁴⁰ See, e.g., AS 2110.39 ("The auditor may obtain an understanding of internal control concurrently with performing tests of controls if he or she obtains sufficient appropriate evidence to achieve the objectives of both procedures") and AS 2301.47 (discussing performance of a substantive test of a transaction concurrently with a test of a control relevant to that transaction (a "dual-purpose test")).

identifying and assessing risks (a risk assessment procedure). But if the procedure also involves obtaining audit evidence to address the risk of material misstatement associated with the occurrence of revenue, the procedure would be a multi-purpose procedure.

Commenters, including an investor-related group, supported the objective of the amendment to specify the auditor's responsibilities when using audit evidence for more than one purpose. One commenter stated that the proposed amendment appears to prohibit an auditor from using audit evidence obtained later in the audit. In that commenter's view, the amendment implied that the auditor must intend to use the audit procedure for more than one purpose, which could be viewed as contradicting the principle that risk assessment should continue throughout the audit.

Several commenters stated that the proposed amendment implied that, for an auditor to use audit evidence for more than one purpose, the auditor would need to know all of the purposes initially when designing the procedure. These commenters added that audit procedures that use technology-assisted analysis can be more iterative in nature and may not be designed for all the purposes that they ultimately fulfill through the nature of the evidence they generate. For example, one commenter noted that when using technology-assisted analysis to substantively test a population of transactions, the auditor may identify a sub-population of transactions that exhibit different characteristics than the rest of the population and use that information to modify the risk assessment of the sub-population. Another commenter noted that an audit procedure may be designed as a risk assessment procedure, but the technology-assisted analysis may provide audit evidence for assertions about classes of transactions or account balances or other evidence regarding the completeness and accuracy of information produced by the company used in the

performance of other audit procedures. These commenters suggested that the amendment be revised by focusing on evaluating the audit evidence obtained from the procedure.

The proposed amendment was not intended to imply that the auditor should not evaluate or consider information obtained from an audit procedure that the auditor was not aware of when initially designing the procedure or that the auditor obtains after a procedure is completed. As noted in the proposal, an auditor may use audit evidence from an audit procedure that involves technology-assisted analysis to achieve one or more objectives, depending on the facts and circumstances of the company and the audit. Further, the auditor would be required to consider and evaluate such information under existing PCAOB standards. For example, as one commenter noted, existing AS 1105 states that audit evidence is all the information, whether obtained from audit procedures or other sources, that is used by the auditor in arriving at the conclusions on which the auditor's opinion is based.⁴¹ Another commenter observed that existing PCAOB standards provide that the auditor's assessment of the risks of material misstatement, including fraud risks, continues throughout the audit.⁴²

The Board continues to believe that in order for an auditor to use an audit procedure for more than one purpose (i.e., as more than a risk assessment procedure, test of controls, or substantive procedure alone), the auditor would need to determine that each of the objectives of the procedure has been achieved. Therefore, after considering the comments received, the Board retained the requirement but removed the reference to "design and perform the procedure." The auditor's responsibilities for designing and performing procedures are already addressed in AS 2110 and AS 2301. Therefore, the final amendment to paragraph .14 of AS 1105 states that "[i]f

⁴¹ See AS 1105.02.

⁴² See, e.g., AS 2110.74 and AS 2301.46.

the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure."

As noted in the proposal, the purpose, objective, and results of multi-purpose procedures should be clearly documented. Under existing PCAOB standards, audit documentation must contain sufficient information to enable an experienced auditor, having no previous connection with the engagement, to understand the nature, timing, extent, and results of the procedures performed, evidence obtained, and conclusions reached.⁴³ Accordingly, audit documentation should make clear each purpose of the multi-purpose procedure, the results of the procedure, the evidence obtained, the conclusions reached, and how the auditor achieved each objective of the procedure.

Commenters were supportive of acknowledging the auditor's documentation responsibilities when using audit evidence for more than one purpose. An investor-related group commented that the audit planning documentation should support how each procedure will achieve each objective and that the audit work papers should document that the work performed achieved each objective. Another commenter also concurred with the notion that the purpose, objective, and results of multi-purpose procedures should be clearly documented. One commenter noted it was unclear whether there are any incremental documentation expectations in comparison to current practice.

Under PCAOB standards, audit documentation should be prepared in sufficient detail to provide a clear understanding of its purpose, source, and the conclusions reached.⁴⁴ This applies

⁴³ See AS 1215.04-.06.

⁴⁴ See AS 1215.04.

also for procedures performed that involve technology-assisted analysis. Therefore, the Board believes that specifying further documentation requirements is unnecessary.

Some commenters suggested that the Board provide an example of using audit evidence from an audit procedure to achieve more than one purpose, including two commenters suggesting an example similar to examples issued by the American Institute of Certified Public Accountants ("AICPA").⁴⁵ Given the evolving nature of the auditor's use of technology, the Board did not include a specific example in the text of the final amendments to AS 1105.14. The proposing release, however, discussed an example where a technology-assisted analysis of accounts related to the procurement process could both: (i) provide the auditor with insights into the volume of payments made to new vendors (e.g., a risk assessment procedure to identify new or different risks); and (ii) match approved purchase orders to invoices received and payments made for each item within a population (e.g., a test of details to address an assessed risk associated with the occurrence of expenses and obligations of liabilities).⁴⁶ The Board believes this example illustrates how auditors would apply the principles-based amendments consistently. If the procedure performed does not achieve each of the intended objectives, other procedures would need to be performed (e.g., other substantive procedures to address assessed risks of material misstatement).

Lastly, two commenters suggested that the Board clarify that the specific audit procedures discussed in AS 1105.14 are not an all-inclusive list, to allow for the use of additional types of procedures, or combination of procedures, in the future as technology evolves. The Board believes the existing language is sufficiently clear because it does not indicate that the

⁴⁵ Examples referenced by commenters included examples issued by the AICPA in AU-C 500, *Audit Evidence*.

⁴⁶ See Proposing Release at 19.

specific audit procedures described in the standard are the only types of audit procedures the auditor can perform.

Specifying Auditor Responsibilities for Evaluating the Reliability of Certain Audit Evidence and Emphasizing the Importance of Appropriate Disaggregation or Detail of Information

See paragraphs .07, .08, .10, .10A, .15, .19, and .A8 of AS 1105 of the amendments.

1. Evaluating the Reliability of External Information Provided by the Company in Electronic Form

The Board proposed to add paragraph .10A to AS 1105 to specify the auditor's responsibility for performing procedures to evaluate the reliability of external information maintained by the company in electronic form when using such information as audit evidence. The proposed paragraph provided that the auditor should evaluate whether such information is reliable for purposes of the audit by performing procedures to: (a) obtain an understanding of the source of the information and the company's procedures by which such information is received, recorded, maintained, and processed in the company's information systems; and (b) test controls (including information technology general controls and automated application controls) over the company's procedures or test the company's procedures.

The Board adopted the amendments substantially as proposed with certain modifications discussed below. The Board also made a conforming amendment to footnote 5 of paragraph .A8 of AS 1105 to include a reference to paragraph .10A.

The Board noted in the proposal that, based on its research, auditors often obtain from companies, and use in the performance of audit procedures, information in electronic form. In many instances, companies have obtained the information from one or more external sources.

PCAOB standards do not include specific requirements regarding information received by the company from external sources, maintained, and in many instances processed by the company, and then included in the information provided to the auditor in electronic form to be used as audit evidence.⁴⁷ Because this information is maintained and potentially can be modified by the company, the Board proposed to amend its standards to address this risk to the reliability of audit evidence that the auditor obtains through using this type of information.

Commenters on this topic, including an investor-related group, supported the Board's objective of addressing the risks that information the company receives from one or more external sources and provides to the auditor in electronic form to use as audit evidence may not be reliable and may have been modified by the company. However, several commenters also stated that further clarification of the requirements was needed:

- Some commenters asked for clarification about the information the company received from one or more external sources and "maintained in its information systems" in electronic form. A few of those commenters also asked whether the use of "its information systems" was intended to be the same as the "information system relevant to financial reporting" in AS 2110.⁴⁸ Several commenters suggested clarifying the proposed examples of the types of information subject to these requirements that were included in the proposed footnote to AS 1105.10A and providing more specific examples, such as a bank statement in PDF format.
- One commenter noted that the proposed amendment may not clarify the difference between maintaining the reliability of the external information received by the

⁴⁷ For example, the company may receive information from a customer in the form of a purchase order and provide that information to the auditor in electronic form.

⁴⁸ See AS 2110.28.

company and what the company does with that information after it is received. The commenter noted that after external information has been received, it is often recorded into the company's information system where it is moved, processed, and changed to the point that it is no longer considered external information, but rather information produced by the company and subject to transactional processes and controls. Another commenter stated that the requirements should not focus on accuracy and completeness because the information is provided to the company from an external source.

- A number of commenters stated that the proposed amendment, specifically the requirement in AS 1105.10A to test controls over procedures or test the company's procedures themselves, implied that the auditor had to test the effectiveness of internal controls in order for the information to be determined to be reliable. Many of these commenters asked for clarification of the distinction between testing the company's controls and testing the company's procedures. One commenter noted that certain smaller and mid-sized companies may not have implemented controls that can be tested. Some commenters added that, because the proposed amendments did not include "where applicable" related to information technology general controls ("ITGCs") and automated application controls, the proposed amendments implied that ITGCs and automated application controls always needed to be tested and effective. Several of these commenters also provided examples of scenarios where ITGCs and automated application controls may not need to be tested, such as controls that reconcile information in the company's information systems to the information the company received from the external source. Commenters also asked whether

information from an external source provided by the company can be tested directly (i.e., not testing a company's controls) and stated that it would be helpful to clarify expectations of the auditor's work effort when evaluating the reliability of such information.

- One commenter indicated that it was unclear how the requirements of footnote 3 of AS 1105.10 and proposed AS 1105.10A interrelate when using information produced by a service organization. Footnote 3 of AS 1105 refers the auditor to responsibilities under AS 2601, *Consideration of an Entity's Use of a Service Organization*, and in an integrated audit, AS 2201, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*, when using information produced by a service organization as audit evidence.
- An investor-related group commented that, in addition to the requirements for the auditor to evaluate the reliability of external information provided by the company in electronic form, the auditor should also be required to evaluate the reliability of digital information maintained outside the company and used by the auditor as audit evidence. Another commenter suggested that the auditor's requirements should also address information obtained directly by the auditor from external sources.

In consideration of comments received, the Board made several modifications to the final amendments, which are described in more detail below. The final amendment (paragraph .10A) provides that the auditor should evaluate whether external information provided by the company in electronic form and used as audit evidence is reliable by:

- a. Obtaining an understanding of (i) the source from which the company received the information; and (ii) the company's process by which the information was received,

maintained, and, where applicable, processed, which includes understanding the nature of any modifications made to the information before it was provided to the auditor; and

b. Testing the information to determine whether it has been modified by the company and evaluating the effect of those modifications; or testing controls over receiving, maintaining, and processing the information (including, where applicable, information technology general controls and automated application controls).

As discussed above, the proposed amendments described auditor responsibilities related to evaluating the reliability of information in electronic form provided by the company to the auditor that the company received from external sources. Examples of such information include, but are not limited to, bank statements, customer order information, information related to cash receipts, and shipping information from third-party carriers provided to the auditor in electronic form.

The Board believes that a principles-based description of the information subject to the requirement that does not list specific types of information, as suggested by some commenters, is in the best interest of audit quality and investor protection. This approach is adaptable to evolving sources and forms of electronic information, considering continued advancements in technology. The Board has clarified the final amendment by removing the reference to "maintained in the company's information systems," which confused some commenters. The use of this term in the proposal was intended to refer broadly to information in electronic form within a company that the company could provide to the auditor.

The Board has revised subparagraph (a) of the final amendment to replace the term "company's procedures" with "company's process." In the proposal the Board used "company's procedures" to align with AS 2110.28(b), which describes the company's procedures to initiate,

authorize, process, and record transactions. However, the Board believes use of the "company's process" is more consistent with AS 2110.30 and .31, which describe the company's business processes that the auditor is required to understand. The Board also believe that using "company's process" clarifies that the intent of the requirement is to understand the flow of the information from the time the company received it from the external source until the company provided it to the auditor. Additional refinements made to this requirement include (i) removing the word "recorded" because receiving, processing, and maintaining data would encompass recording it; and (ii) adding "where applicable" to address examples provided by commenters where companies receive information from external sources that may be maintained only – and not processed – by the company.

The Board also made revisions to clarify that, as part of understanding how the information received from external sources is processed by the company, the auditor should obtain an understanding of the nature of any modifications made to the information. This revision focuses the auditor on identifying the circumstances where the information may have been modified or changed by the company.

The Board did not intend to imply that internal controls are required to be tested and effective in order for the auditor to be able to determine that external information is reliable for purposes of the audit, as suggested by some commenters. Rather, the proposed amendment was meant to (i) clarify the auditor's responsibility for performing procedures to evaluate the reliability of audit evidence; and (ii) address the risk that the company may have modified the external information prior to providing it to the auditor for use as audit evidence.

The Board revised the final amendment in subparagraph (b) to require that the auditor (i) test the information to determine whether it has been modified by the company and evaluate the

effect of those modifications; or (ii) test controls over receiving, maintaining, and where applicable, processing the information. As discussed in the proposing release, the auditor may determine the information has been modified by the company by either comparing the information provided to the auditor to (i) the information the company received from the external source; or (ii) information obtained directly by the auditor from external sources. Some commenters referred to comparing the information provided by the company to the information the company received from the external source, as testing the information "directly" for reliability.

For example, the auditor may obtain customer purchase order information from the company's information systems and compare this information to the original purchase order submitted by the customer to determine whether any modifications were made by the company. In another example, the auditor may obtain interest rate information from the company's information systems and compare it to the original information from the U.S. Department of Treasury. Under the final amendments, if the auditor determines modifications were made by the company, the auditor would have to evaluate the effect of the modifications on the reliability of the information. For example, the auditor may determine that certain modifications (e.g., formatting of the date of a transaction from the European date format to the U.S. date format) have not affected the reliability of the information. Conversely, the auditor may determine that inadvertent or intentional deletions, or improper alterations of key data elements by the company (e.g., customer details, transaction amount, product quantity) have negatively affected the reliability of information.

Finally, the Board further clarified the amendment to indicate that if the auditor chooses to test controls instead of testing the information as described above, the auditor should test

controls over the receiving, maintaining, and where applicable, processing of the information that are relevant to the auditor's evaluation of whether the information is reliable for purposes of the audit. This aligns with the Board's intent in the proposal that described testing controls over the company's procedures. Controls over processing the information would include internal controls over any modifications made by the company to the information.

Several commenters noted that in instances where controls over the information are ineffective, or are not implemented or formalized, the auditor may need to perform procedures other than testing internal controls to determine the reliability of the information provided by the company. In response to these comments, the Board believes it is important to remind auditors that PCAOB standards already address circumstances when the auditor encounters ineffective controls, or controls that are not implemented or formalized. It is important for the auditor to also understand the implications of such findings on the nature, timing, and extent of procedures that the auditor needs to perform in accordance with PCAOB standards.⁴⁹

The Board also considered the comments related to specifying requirements for the auditor to evaluate the reliability of external information obtained directly by the auditor from external sources, which would include digital information maintained outside the company and used as audit evidence. Under existing standards, audit evidence must be reliable, and its reliability depends on the nature and the source of the evidence and the circumstances under which it is obtained.⁵⁰ In light of the existing requirements within AS 1105, the Board believes

⁴⁹ See, e.g., AS 1105.08, AS 2110.25 and .B1-.B6, and AS 2301.32-.34.

⁵⁰ See AS 1105.06 and AS 1105.08. See also PCAOB, *Staff Guidance – Insights for Auditors Evaluating the Relevance and Reliability of Audit Evidence Obtained From External Sources* (Oct. 2021), available at https://assets.pcaobus.org/pcaob-dev/docs/default-source/standards/documents/evaluating-relevance-and-reliability-of-audit-evidence-obtained-from-external-sources.pdf?sfvrsn=48b638b_6.

that the auditor's responsibilities to evaluate the reliability of information obtained from external sources are sufficiently clear and that further amendments to address information obtained by the auditor directly from external sources are not necessary. In addition, the Board considered but decided not to address in this project auditors' responsibilities related to using information produced by a service organization as audit evidence.⁵¹

Further, as discussed below, the Board's proposed amendment was intended to highlight the importance of controls over information technology. The Board considered the comments received, and the final amendment clarifies that ITGCs and automated application controls should be tested where applicable (e.g., where controls are selected for testing or where a significant amount of information supporting one or more relevant assertions is electronically initiated, recorded, processed, or reported).⁵² The Board believes testing ITGCs and automated application controls is important to mitigate the risk that the information provided by the company in electronic form is not reliable. In some cases, the auditor may already be testing the relevant ITGCs and automated application controls, while in other cases the auditor may need to test additional controls.

Consistent with the proposal, the Board did not prescribe the nature, timing, or extent of the auditor's procedures to evaluate the reliability of the external information. An auditor would design the procedures considering the wide variety of types of external information received by companies and differences in the processes for receiving, maintaining and, where applicable,

⁵¹ See AS 2601 for the auditor's requirements related to the use of a service organization. The Board has a separate standard-setting project on its mid-term standard-setting agenda (<https://pcaobus.org/oversight/standards/standard-setting-research-projects>) related to the use of a service organization, which may result in changes to AS 2601 and the auditor's responsibilities regarding the use of a service organization.

⁵² See, e.g., AS 2301.17.

processing such information. Further, the nature, timing, and extent of the auditor's procedures would depend on the purpose for which the auditor uses the information whose reliability is being evaluated. In general, performing audit procedures to address the risks of material misstatement involves obtaining more persuasive evidence than in performing risk assessment procedures.⁵³ Accordingly, evaluating the reliability of information used in substantive procedures and tests of controls would require more auditor effort than evaluating the reliability of information used in risk assessment procedures.

2. Emphasizing the Importance of Controls Over Information Technology

The Board proposed several amendments to AS 1105 to emphasize the importance of controls over information technology for the reliability of audit evidence. As noted above, auditors obtain from companies, and use in the performance of audit procedures, large volumes of information in electronic form. The reliability of such information is increased when the company's controls over that information – including, where applicable, ITGCs and automated application controls – are effective. The Board adopted the amendments to paragraph .10 of AS 1105 as proposed, and amendments to paragraphs .08 and .15 of AS 1105 substantially as proposed, with minor modifications as described below.

Commenters on this topic supported the objective of emphasizing the importance of controls over information technology in establishing reliability of information used as audit evidence. Several commenters opined that the proposed amendments, more specifically the proposed amendments to paragraph .15 of AS 1105, implied that internal controls, including ITGCs and automated application controls, would need to be tested and determined effective in order to determine that the information is reliable.

⁵³ See generally AS 2301.09(a), .18, and .39.

The proposed amendments were not intended to imply that (i) internal controls are required to be tested and effective in order for the auditor to be able to determine that information is reliable for purposes of the audit; or (ii) testing other relevant controls is less important or unnecessary. Rather, the proposed amendments were meant to highlight to the auditor that certain information is more reliable when internal controls are effective, and where applicable, those internal controls include ITGCs and automated application controls, which is consistent with existing PCAOB standards.⁵⁴ The Board's standards also describe scenarios where the sufficiency and appropriateness of the audit evidence usually depends on the effectiveness of controls.⁵⁵ The amendments did not change these existing principles.

Further, in the proposing release the Board explained that the proposed amendments state "where applicable" in relation to the controls over information technology because information produced by the company may also include information that is not in electronic form, or information that is subject to manual controls. One commenter noted that this explanation was informative and suggested incorporating it into the amendments. Another commenter also recommended defining "where applicable" with clear factors or examples of when ITGCs and automated application controls would be applicable. Because of the wide variety of types and sources of information, and ways in which companies use information, it would be impracticable to specify scenarios where ITGCs and automated application controls would be applicable.

Having considered the above comments and the Board's intent to retain the existing principle in paragraph .08 of AS 1105 that certain information is more reliable when controls are effective, the Board modified paragraph .15 of AS 1105 within the final amendments to align the

⁵⁴ See existing AS 1105.08.

⁵⁵ See, e.g., AS 2301.17.

language with AS 1105.08. In addition, the final amendments to paragraph .08 were also aligned with the terminology in paragraph .10A of AS 1105 described above.

Lastly, separate from commenting on the proposed amendments to paragraph .08 of AS 1105 discussed above, some commenters suggested amendments to modernize the last bullet point of the paragraph, which describes that evidence from original documents is more reliable. Three commenters asserted that the information may exist in different forms (e.g., paper or electronic form) and may be in a format other than a document (e.g., unprocessed data). In the views of two of these commenters, no physical or original document exists when an electronic data transmission from a customer initiates a transaction in a company's ERP system. These commenters suggested modernizing the language to focus on the original form of the audit evidence and any subsequent conversion, copying, or other modifications. The Board considered the comments received but did not amend the language because the bullet points in paragraph .08 of AS 1105 are intended to be examples of factors that may affect the reliability of audit evidence. The existing language provides an example of one type of audit evidence – original documents that have not been converted, copied, or otherwise modified – which is consistent with the principles suggested by the commenters.

3. Emphasizing the Importance of Appropriate Disaggregation or Detail of Information

The Board proposed to amend paragraph .07 of AS 1105 to emphasize that the relevance of audit evidence depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure. Whether an auditor performs tests of details, substantive analytical procedures, or other tests, technology-assisted analysis may enable the auditor to analyze large volumes of information at various levels of disaggregation (e.g., regional

or global) or detail (e.g., relevant characteristics of individual items such as product type or company division). The appropriate level of disaggregation or detail of information that the auditor uses as audit evidence is important for obtaining audit evidence that is relevant in supporting the auditor's conclusions.⁵⁶ Having considered the comments received, the Board adopted the amendment as proposed.

The level of disaggregation or detail that is appropriate depends on the objective of the audit procedure. For example, when testing the valuation assertion of residential loans that are measured based on the fair value of the collateral, disaggregated sales data for residential properties by geographic location would likely provide more relevant audit evidence than combined sales data for both commercial and residential properties by geographic location. In another example, when performing a substantive analytical procedure and analyzing the plausibility of relationships between revenue and other information recorded by the company, using revenue disaggregated by product type would likely be more relevant for the auditor's analysis and result in obtaining more relevant audit evidence than if the auditor used the amount of revenue in the aggregate.

Commenters on this topic were supportive of the proposed amendment and indicated that it aligned with current practice. Some of these commenters suggested providing examples, stating that examples would help auditors in understanding and applying the amendment. Consistent with the proposal, the final amendment does not prescribe an expected level of

⁵⁶ See, e.g., PCAOB, *Staff Guidance – Insights for Auditors Evaluating the Relevance and Reliability of Audit Evidence Obtained From External Sources* (Oct. 2021) at 5, available at https://assets.pcaobus.org/pcaob-dev/docs/default-source/standards/documents/evaluating-relevance-and-reliability-of-audit-evidence-obtained-from-external-sources.pdf?sfvrsn=48b638b_6.

disaggregation or detail, as auditor judgment is needed to determine the relevance of information based on the objective of the audit procedure.

4. Updating Certain Terminology in AS 1105

The Board proposed to update certain terminology used to describe audit procedures for obtaining audit evidence in AS 1105, without changing the meaning of the corresponding requirements. For example, considering the greater availability and use of information in electronic form, the Board proposed to use the term "information" instead of the term "documents and records" in AS 1105.15 and .19. Further, to avoid a misinterpretation that only certain procedures could be performed electronically, the Board proposed to remove the reference to performing recalculation "manually or electronically" in AS 1105.19. For consistent terminology, the Board also proposed to replace the terms "generated internally by the company" in AS 1105.08 and "internal" in AS 1105.15 with the term "produced by the company." Having considered the comments received, the Board adopted the amendments to paragraphs .08, .15, and .19 of AS 1105 as proposed.

Commenters on this topic supported the updates to certain terminology described above, and stated the updated terminology appears clear and appropriate. One commenter suggested modifying the terminology in paragraph .19 from "checking" to "testing" because testing more clearly describes an audit procedure that is being performed over the mathematical accuracy of information. Having considered the comment, the Board retained the existing terminology in paragraph .19 of "checking" to avoid a potential for confusion with test of details.

EFFECTIVE DATE

The Board determined that the amendments will take effect, subject to approval by the SEC, for audits of financial statements for fiscal years beginning on or after December 15, 2025.

In the proposing release, the Board sought comment on the amount of time auditors would need before the amendments become effective, if adopted by the Board and approved by the SEC. The Board proposed an effective date for audits with fiscal years ending on or after June 30 in the year after approval by the SEC.

Several, mostly larger firms and firm-related groups, supported an effective date of audits of financial statements for fiscal years beginning on or after December 15 at least one year following SEC approval, or for fiscal years ending on or after December 15 at least two years following SEC approval. Two commenters supported an effective date two years after SEC approval. These commenters indicated that this would give firms the necessary time to update firm methodologies, tools, and develop and implement training. In addition, several commenters highlighted that additional time would be needed because of the potential indirect impact on companies, especially if companies need to implement or formalize controls or processes around information received from one or more external sources, and auditors need to verify that the controls have been designed and implemented appropriately. Another commenter highlighted that the proposed effective date may be too soon to allow auditors to update methodologies, provide appropriate training and effectively implement the standards. In addition, multiple commenters, mainly accounting firms, suggested that the Board consider the effective dates for other standard-setting projects when determining the effective date for the amendments.

The Board appreciates the concerns and preferences expressed by the commenters. Having considered the requirements of the final amendments, the differences between the amendments and the existing standards, the Board's understanding of firms' current practices, and the effective dates for other Board rulemaking projects, the Board believes that the effective date, subject to SEC approval, for audits of financial statements for fiscal years beginning on or

after December 15, 2025 will provide auditors with a reasonable time period to implement the final amendments, without unduly delaying the intended benefits resulting from these improvements to PCAOB standards, and is consistent with the Board's mission to protect investors and further the public interest.

D. Economic Considerations and Application to Audits of Emerging Growth Companies

ECONOMIC CONSIDERATIONS

The Board is mindful of the economic impacts of its standard setting. This section describes the economic baseline, economic need, expected economic impacts of the final amendments, and alternative approaches considered. There are limited data and research findings available to estimate quantitatively the economic impacts of the final amendments. Therefore, the Board's economic discussion is largely qualitative in nature. However, where reasonable and feasible, the analysis incorporates quantitative information, including descriptive statistics on the tools that firms use in technology-assisted analysis.⁵⁷

Baseline

The discussion above describes important components of the baseline against which the economic impact of the final amendments can be considered, including the Board's existing standards, firms' current practices, and observations from the Board's oversight activities. The discussion below focuses on two additional aspects of current practice that informed the Board's understanding of the economic baseline: (i) the PCAOB staff's analysis of the tools that auditors

⁵⁷ As noted above, this release uses the term "technology-assisted analysis" in reference to the analysis of information in electronic form that is performed with the assistance of technology-based tools. Others, including firms and academics, may refer to such analysis as "data analysis" or "data analytics." The Board's use of "data analysis" or "data analytics" was intended to align with terminology used by the source cited. The terms "data analysis" or "data analytics" should not be confused with the term "analytical procedures" that is used in PCAOB standards to refer to a specific type of audit procedure (*see* AS 1105.21) that may be performed with or without the use of information in electronic form or technology-based data analysis tools.

use in technology-assisted analysis; and (ii) research on auditors' use of technology-assisted analysis.

1. Staff Analysis of Tools that Auditors Use in Technology-Assisted Analysis

PCAOB staff reviewed information provided by firms pursuant to the PCAOB's oversight activities regarding tools they use in technology-assisted analysis. The information identifies and describes tools used by audit engagement teams. The staff reviewed information provided by the U.S. global network firms ("GNFs") as well as seven U.S. non-affiliated firms ("NAFs").⁵⁸ The information was first provided for the 2018 inspection year and was available through the 2023 inspection year for the GNFs and NAFs analyzed.

Firms reported using both internally developed and externally purchased tools. Some of the externally purchased tools were customized by the firms. The nature and number of tools varied across firms, and their use varied with the facts and circumstances of specific audit engagements. Some firms describe their tools by individual use case or functionality based on how the tool has been tailored by the firm (e.g., one tool to test accounts receivable and another tool to test inventory using the same software program), and other firms describe their tools grouped by software program, thus affecting the number of unique tools reported by the firms. Some firms consolidated some of their tools over time, thus reducing the number of unique tools they used, although the number of audit engagements on which tools are used has not decreased. For example, instead of having separate tools to perform technology-assisted analysis and analytical procedures performed as part of the auditor's risk assessment, some firms have

⁵⁸ The U.S. GNFs are BDO USA P.C., Deloitte & Touche LLP, Ernst & Young LLP, Grant Thornton LLP, KPMG LLP, and PricewaterhouseCoopers LLP. U.S. NAF firms include registered firms that are not global network firms.

consolidated both functions into one tool. Firms generally do not require the use of such tools on audit engagements.

The average number of tools used by audit engagement teams, as reported to the PCAOB by the U.S. GNFs, increased from approximately 13 to approximately 18 per firm, or approximately 38%, between 2018 and 2023. In the 2023 inspection year, U.S. GNFs reported that 90% of their tools are used for data visualization, summarization, tabulation, or modeling.⁵⁹ All the U.S. GNFs reported using tools to assist in: (i) identifying and selecting journal entries; and (ii) selecting samples for testing. The U.S. GNFs reported having tools that support both risk assessment (e.g., assessing loan risk) and substantive procedures (e.g., performing journal entry testing or fair value testing). The U.S. GNFs developed approximately 75% of the reported tools in-house while the rest were purchased externally. Furthermore, approximately 18% of the U.S. GNFs' tools used cloud computing. Less than 7% of the U.S. GNFs' tools used blockchain technology, artificial intelligence, or robotic process automation. All the U.S. GNFs' tools used company data and approximately 20% also used third-party data.

Compared to U.S. GNFs, the U.S. NAFs within the scope of the PCAOB staff's review reported to the PCAOB using fewer tools. In the 2023 inspection year, on average, the U.S. NAFs reported using approximately six tools per firm. For a subset of these firms, the average number of tools increased from approximately two tools per firm to approximately five tools per firm between 2020 and 2023.⁶⁰ The U.S. NAFs used the tools to visualize, summarize, and model data. Some of the U.S. NAFs reviewed use third-party software as their data analysis tools

⁵⁹ For example, some firms identified Microsoft Power BI and IDEA as tools used for data visualization, summarization, tabulation, or modelling.

⁶⁰ Due to changes in the data collection process and changes in firms' status as annually inspected, data is not available for all firms in all years. The overall 2023 estimate is based on data from seven U.S. NAFs, and the 2020-2023 trend data is based on data from five U.S. NAFs.

and used company data (e.g., transactional and journal entry data) as inputs. One U.S. NAF firm developed an in-house tool to assist with determining the completeness and accuracy of journal entry data used for testing journal entries.

One commenter asserted that the PCAOB should have information on firms' use of technology-based tools, as well as firms' improper use of tools, through its oversight activities. Information obtained through PCAOB oversight activities regarding firms' use of technology-based tools is presented here, and information related to firms' improper use of tools is presented above. As described above, the nature and extent of the use of technology-based tools in an audit varies by firm and by individual audit engagement. The Board's rulemaking has been informed by all relevant information as described in this release.

2. Research on Auditors' Use of Technology-Assisted Analysis

Academic studies regarding the prevalence of technology-based tools used to analyze information in electronic form and the impacts of using such tools in audits are limited. However, several recent surveys provide insights regarding: (i) how auditors have been incorporating data analytics into their audit approaches; and (ii) potential impediments to auditors' further implementation of data analytics. One commenter referenced additional academic research that was not originally cited in the proposing release. The Board considered this research and included references to articles that are relevant to the analysis in this release.⁶¹

⁶¹ Several of the referenced papers report the results of experiments examining the behavioral factors associated with auditors' use of data analytics. These papers consider nuances of auditor behavior in specific circumstances that may not be generalizable to other settings because the results are based on hypothetical, self-reported choices rather than real-world audit settings. However, their results may be useful for auditors to consider in their use and implementation of technology-assisted analysis. *See* Tongrui Cao, Rong-Ruey Duh, Hun-Tong Tan, and Tu Xu, *Enhancing Auditors' Reliance on Data Analytics Under Inspection Risk Using Fixed and Growth Mindsets*, 97 *The Accounting Review* 131 (2022). *See also* Jared Koreff, *Are Auditors' Reliance on Conclusions from Data Analytics Impacted by Different Data Analytic Inputs?*, 36 *Journal of Information Systems* 19 (2022). *See also* Dereck Barr-Pulliam, Joseph Brazel, Jennifer McCallen, and Kimberly Walker, *Data Analytics and Skeptical Actions:*

Regarding incorporating data analytics into audit approaches, the surveys indicate that while the use of data analytics presently may not be widespread, it is becoming more common in various aspects of the audit, primarily risk assessment and, to a lesser extent, substantive procedures. For example, a 2017 survey of U.S. auditors reported that auditors used data analytics in risk assessment and journal entry testing.⁶² Also, a survey of Norwegian auditors, some of whom perform audits under PCAOB standards, reported that data analytics were not widely used and were used primarily as supplementary evidence. In this survey, the respondents indicated that data analytics were used primarily in risk assessment and various types of substantive procedures, including analytical procedures.⁶³ A 2018 to 2019 survey of auditors in certain larger New Zealand firms reported that auditors are more frequently encountering accessible, large company data sets (i.e., data sets from the companies under audit). The respondents reported that third-party tools to process the data are increasingly available and

The Countervailing Effects of False Positives and Consistent Rewards for Skepticism, available at SSRN 3537180 (2023). See also Dereck Barr-Pulliam, Helen L. Brown-Libur, and Kerri-Ann Sanderson, *The Effects of the Internal Control Opinion and Use of Audit Data Analytics on Perceptions of Audit Quality, Assurance, and Auditor Negligence*, 41 *Auditing: A Journal of Practice & Theory* 25 (2022).

⁶² See Ashley A. Austin, Tina D. Carpenter, Margaret H. Christ, and Christy S. Nielson, *The Data Analytics Journey: Interactions Among Auditors, Managers, Regulation, and Technology*, 38 *Contemporary Accounting Research* 1888 (2021). The survey also states:

[A]uditors report that they strategically leverage data analytics to provide clients with business-related insights. However, regulators voice concerns that this practice might impair auditor independence and reduce audit quality.

The final amendments are not intended to suggest that when using technology-assisted analysis in an audit, auditors do not need to comply with PCAOB independence standards and rules, and the independence rules of the SEC. Auditors are still expected to comply with these standards and rules when using technology-assisted analysis on an audit engagement.

⁶³ See Aasmund Eilifsen, Finn Kinserdal, William F. Messier, Jr., and Thomas E. McKee, *An Exploratory Study into the Use of Audit Data Analytics on Audit Engagements*, 34 *Accounting Horizons* 75 (2020). The survey appears to have been performed around 2017 - 2018.

allow auditors with less expertise in data analytics to make effective use of data.⁶⁴ A 2020 Australian study that focused on big data analytics found that the use of big data analytics has reduced auditor time spent on manual-intensive tasks and increased time available for tasks requiring critical thinking and key judgments.⁶⁵ A 2023 Canadian study that also focused on big data analytics found that big data analytics improves financial reporting quality.⁶⁶

Earlier surveys reported qualitatively similar, though less prevalent, use of data analytics. For example, a 2016 survey of Canadian firms reported that 63% and 39% of respondents from large firms and small to mid-sized firms, respectively, had used data analytics, most commonly in the risk assessment and substantive procedures phases. Both groups reported that data analytics were used to provide corroborative evidence for assertions about classes of transactions for the period under audit. However, only smaller and mid-sized firms reported that data analytics were also used to provide primary evidence for assertions about classes of transactions for the period under audit and account balances at period end. Furthermore, only larger firms reported that data analytics were also used to provide corroborative evidence for assertions about account balances at period end.⁶⁷

A survey of 2015 year-end audits performed by U.K. firms reported that the use of data analytics was not as prevalent as the market might expect, with the most common application

⁶⁴ See Angela Liew, Peter Boxall, and Denny Setiawan, *The Transformation to Data Analytics in Big-Four Financial Audit: What, Why and How?*, 34 *Pacific Accounting Review* 569 (2022).

⁶⁵ See Michael Kend and Lan Anh Nguyen, *Big Data Analytics and Other Emerging Technologies: The Impact on the Australian Audit and Assurance Profession*, 30 *Australian Accounting Review* 269 (2020).

⁶⁶ See Isam Saleh, Yahya Marei, Maha Ayoush, and Malik Muneer Abu Afifa, *Big Data Analytics and Financial Reporting Quality: Qualitative Evidence from Canada*, 21 *Journal of Financial Reporting and Accounting* 83 (2023).

⁶⁷ See CPA Canada, *Audit Data Analytics Alert: Survey on Use of Audit Data Analytics in Canada* (Sept. 2017) at 7, Exhibit 4 and 10, Exhibit 7.

being journal entry testing.⁶⁸ A 2015 survey of U.K. and EU auditors found that data analytics were being used in both risk assessment procedures and to perform certain specific audit procedures (e.g., recalculation).⁶⁹ Finally, a 2014 survey of U.S. auditors reported that they often use information technology to perform risk assessment, analytical procedures, sampling, internal control evaluations, and internal control documentation. The respondents identified moderate use of data analytics in the context of client administrative or practice management.⁷⁰

Regarding potential impediments to the implementation of data analytics, surveys indicate that some firms are reluctant to implement data analytics in their audit approach due to perceived regulatory risks. For example, one survey found that auditors were cautious about implementing data analytics due to a lack of explicit regulation. Respondents reported performing both tests of details that do not involve data analytics and those that do involve data analytics in audits under PCAOB standards.⁷¹ Another survey found that auditors did not require the use of advanced data analytic tools partly due to uncertainty regarding how regulatory authorities would perceive the quality of the audit evidence produced. However, the respondents tended to agree that both standard setters and the auditing standards themselves allow

⁶⁸ See Financial Reporting Council, *Audit Quality Thematic Review: The Use of Data Analytics in the Audit of Financial Statements* (Jan. 30, 2017) at 11.

⁶⁹ See George Salijeni, Anna Samsonova-Taddei, and Stuart Turley, *Big Data and Changes in Audit Technology: Contemplating a Research Agenda*, 49 *Accounting and Business Research* 95 (2019).

⁷⁰ See D. Jordan Lowe, James L. Bierstaker, Diane J. Janvrin, and J. Gregory Jenkins, *Information Technology in an Audit Context: Have the Big 4 Lost Their Advantage?*, 32 *Journal of Information Systems* 87 (2018). The authors do not define the term "data analytics," and they present it as an application of information technology in the audit distinct from other audit planning and audit testing applications. However, the Board believes it is likely that some of the applications of information technology reported in the study would be impacted by the amendments and hence provide relevant baseline information.

⁷¹ See Austin et al., *The Data Analytics Journey* 1910. For similar findings, see also Liew et al., *The Transformation* 579-580.

information obtained from data analytics to be used as audit evidence.⁷² A different survey found that some auditors were reluctant to implement data analytics because the auditing standards do not specifically address them.⁷³ These survey findings are consistent with other surveys that find auditors structure their audit approaches to manage regulatory risks arising from inspections, including risks associated with compliance with PCAOB standards.⁷⁴ One commenter on the proposed amendments cited a study which noted that "uncertainty about regulators' response and acceptance of emerging technologies can hinder its [emerging technology's] adoption."⁷⁵ However, by contrast, another survey found that the audit regulatory environment was not commonly cited by respondents as an impediment to the use of data analytics.⁷⁶

Overall, the research suggests that auditors' use of technology-assisted analysis in designing and performing audit procedures is becoming increasingly prevalent. Some commenters also acknowledged that the use of technology-assisted analysis is becoming more prevalent. An investor-related group provided examples of expanded use of technology by both companies and audit firms, including the use of large, searchable databases and the development

⁷² See Eilifsen et al., *An Exploratory Study*. For similar findings, see also Felix Krieger, Paul Drews, and Patrick Velte, *Explaining the (Non-) Adoption of Advanced Data Analytics in Auditing: A Process Theory*, 41 *International Journal of Accounting Information Systems* 1 (2021).

⁷³ See Salijeni et al., *Big Data* 110.

⁷⁴ See Kimberly D. Westermann, Jeffrey Cohen, and Greg Trompeter, *PCAOB Inspections: Public Accounting Firms on "Trial,"* 36 *Contemporary Accounting Research* 694 (2019). See also Lindsay M. Johnson, Marsha B. Keune, and Jennifer Winchel, *U.S. Auditors' Perceptions of the PCAOB Inspection Process: A Behavioral Examination*, 36 *Contemporary Accounting Research* 1540 (2019).

⁷⁵ See Dereck Barr-Pulliam, Helen L. Brown-Libur, and Ivy Munoko, *The Effects of Person-Specific, Task, and Environmental Factors on Digital Transformation and Innovation in Auditing: A Review of the Literature*, 33 *Journal of International Financial Management & Accounting* 337 (2022). This literature review focuses on emerging technologies broadly. Accordingly, much of the research it discusses is not directly relevant to the baseline for these amendments. However, several of the studies it cites are relevant and have already been discussed in this subsection, for example, Austin et al., *The Data Analytics Journey*.

⁷⁶ See CPA Canada, *Audit Data Analytics*, at Exhibit 10.

of tools for analyzing large volumes of data. This provides a baseline for considering the potential impacts of the final amendments. The research also suggests that some auditors perceive regulatory risks when implementing data analytics. Some commenters acknowledged that regulatory uncertainty has been a factor in firms' hesitance to use technology-assisted analysis. This provides evidence of a potential problem that standard setting may address.

Need

Low-quality audits can occur for a number of reasons, including the following two reasons. First, the company under audit, investors, and other financial statement users cannot easily observe the procedures performed by the auditor, and thus the quality of the audit. This leads to a risk that, unbeknownst to the company under audit, investors, or other financial statement users, the auditor may perform a low-quality audit.⁷⁷

Second, the federal securities laws require that an issuer retain an auditor for the purpose of preparing or issuing an audit report. While the appointment, compensation, and oversight of the work of the registered public accounting firm conducting the audit is, under Sarbanes-Oxley, entrusted to the issuer's audit committee,⁷⁸ there is nonetheless a risk that the auditor may seek to

⁷⁷ See, e.g., Monika Causholli and W. Robert Knechel, *An Examination of the Credence Attributes of an Audit*, 26 Accounting Horizons 631, 632 (2012):

During the audit process, the auditor is responsible for making decisions concerning risk assessment, total effort, labor allocation, and the timing and extent of audit procedures that will be implemented to reduce the residual risk of material misstatements. As a non-expert, the auditee may not be able to judge the appropriateness of such decisions. Moreover, the auditee may not be able to ascertain the extent to which the risk of material misstatement has been reduced even after the audit is completed. Thus, information asymmetry exists between the auditee and the auditor, the benefit of which accrues to the auditor. If such is the case, the auditor may have incentives to: under-audit, or expend less audit effort than is required to reduce the uncertainty about misstatements in the auditee's financial statements to the level that is appropriate for the auditee.

⁷⁸ See Section 301 of Sarbanes-Oxley, 15 U.S.C § 78f(m) (also requiring that the firm "report directly to the audit committee"). As an additional safeguard, the auditor is also required to be independent of the audit client. See 17 CFR 210.2-01.

satisfy the interests of the company under audit rather than the interests of investors and other financial statement users.⁷⁹ This could arise, for example, through audit committee identification with the company or its management (e.g., for compensation) or through management influence over the audit committee's supervision of the auditor, resulting in a *de facto* principal-agent relationship between the company and the auditor.⁸⁰ Effective auditing standards help address these risks by explicitly assigning responsibilities to the auditor that, if executed properly, are expected to result in high-quality audits that satisfy the interests of audited companies, investors, and other financial statement users.

Economic theory suggests that technology is integral to the auditor's production function—i.e., the quantities of capital and labor needed to produce a given level of audit quality. As technology evolves, so do the quantities of capital and labor needed to produce a given level of audit quality.⁸¹ Auditing standards that do not appropriately accommodate the evolution of technology may therefore inadvertently deter or insufficiently facilitate improvements to the audit approach. Risk-averse auditors may be especially cautious about incorporating significant new technological developments into their audit approaches because they may be either unfamiliar with the technology or unsure whether a new audit approach would comply with the PCAOB's auditing standards. On the other hand, auditing standards that are too accommodative

⁷⁹ See, e.g., Joshua Ronen, *Corporate Audits and How to Fix Them*, 24 *Journal of Economic Perspectives* 189 (2010).

⁸⁰ See *id.*; see also, e.g., Liesbeth Bruynseels and Eddy Cardinaels, *The Audit Committee: Management Watchdog or Personal Friend of the CEO?*, 89 *The Accounting Review* 113 (2014); Cory A. Cassell, Linda A. Myers, Roy Schmardebeck, and Jian Zhou, *The Monitoring Effectiveness of Co-Opted Audit Committees*, 35 *Contemporary Accounting Research* 1732 (2018); Nathan R. Berglund, Michelle Draeger, and Mikhail Sterin, *Management's Undue Influence over Audit Committee Members: Evidence from Auditor Reporting and Opinion Shopping*, 41 *Auditing: A Journal of Practice & Theory* 49 (2022).

⁸¹ See Gregory N. Mankiw, *Principles of Economics* (6th ed. 2008) at 76 (discussing how technology shifts the supply curve).

(e.g., by not adequately addressing the reliability of information used in a technology-based analysis) may not sufficiently address potential risks to audit quality arising from new audit approaches.

As described above, since 2010, when the PCAOB released a suite of auditing standards related to the auditor's assessment of and response to risk, two key technological developments have occurred. First, ERP systems that structure and house large volumes of information in electronic form have become more prevalent among companies. For example, one study reports that the global ERP market size increased by 60% between 2006 and 2012.⁸² As a result, auditors have greater access to large volumes of company-produced and third-party information in electronic form that may potentially serve as audit evidence. Second, the use of more sophisticated data analysis tools has become more prevalent among auditors.⁸³ As noted above, the PCAOB staff's analysis of the tools that firms use in technology-assisted analysis indicated that the number of such tools used by U.S. GNFs in audits increased by 38% between 2018 and 2023.⁸⁴ One commenter noted that the advancement of analytical tools has increased auditor capabilities in data preparation and data validation.

⁸² See Adelin Trusculescu, Anca Draghici, and Claudiu Tiberiu Albuлесcu, *Key Metrics and Key Drivers in the Valuation of Public Enterprise Resource Planning Companies*, 64 *Procedia Computer Science* 917 (2015).

⁸³ This may be caused in part by a decrease in the quality-adjusted cost of software (i.e., the cost of software holding quality fixed). For example, see U.S. Bureau of Economic Analysis, "Table 5.6.4. Price Indexes for Private Fixed Investment in Intellectual Property Products by Type" available at https://apps.bea.gov/iTable/?reqid=19&step=3&isuri=1&nipa_table_list=330&categories=survey&_gl=1*k50itr*_ga*MTMyMjk5NTAzMS4xNzA5ODQ0OTEx*_ga_J4698JNNFT*MTcwOTg0NDkxMS4xLjAuMTcwOTg0NDkxMS42MC4wLjA (accessed June 3, 2024) (indicating that the price index for capital formation in software by the business sector has decreased by approximately 12% between 2010 and 2022). In preparing its price indices, the U.S. Bureau of Economic Analysis attempts to control for changes in product quality over time. Improvements to product quality may have contributed to some increase in the cost of software, including some of the software that can process large volumes of data.

⁸⁴ See discussion above. See also Lowe et al., *Information Technology* 95 (reporting an increase in the use of information technology in audits between 2004 and 2014).

These recent technological developments have been changing the way technology-assisted analysis is used in audits, as discussed in more detail above. Although PCAOB standards related to the auditor's assessment of and response to risk generally were designed to apply to audits that use information technology, they may be less effective in providing direction to auditors if the standards do not address certain advancements in the use of technology-assisted analysis in audits. Modifying existing PCAOB standards through the final amendments addresses this risk, as discussed below. Many commenters, including an investor-related group, indicated there was a need for such standard setting given that the use of information in electronic form, and the use of technology-based tools by companies and their auditors to analyze such information, have expanded significantly since these standards were developed.

The remainder of this section discusses the specific problem that the final amendments are intended to address and how the amendments address it.

1. Problem to be Addressed

Audit procedures that involve technology-assisted analysis may be an effective way to obtain persuasive audit evidence. Although the Board's research showed that auditors are using technology-assisted analysis to obtain audit evidence, it also indicated that existing PCAOB standards could address more specifically certain aspects of designing and performing audit procedures that involve technology-assisted analysis. As discussed in detail above, these aspects include specifying auditors' responsibilities when performing tests of details, using an audit procedure for more than one purpose, investigating certain items identified by the auditor when performing a test of details, and evaluating the reliability of information the company receives from one or more external sources that is provided to the auditor in electronic form and used as audit evidence.

Consequently, under existing standards, there is a risk that when using technology-based tools to design and perform audit procedures that involve technology-assisted analysis, an auditor may issue an auditor's report without having obtained sufficient appropriate audit evidence to provide a reasonable basis for the opinion expressed in the report. For example, if an auditor does not appropriately investigate certain items identified through technology-assisted analysis when performing a test of details, the auditor may not identify a misstatement that would need to be evaluated under PCAOB standards. In another example, if an auditor does not appropriately evaluate the level of disaggregation of certain information maintained by the company, the auditor would not be able to determine, under PCAOB standards, whether the evidence obtained is relevant to the assertion being tested.⁸⁵

Furthermore, there is a risk that auditors may choose not to involve technology-assisted analysis in the audit procedures they perform, even if performing such procedures would be a more effective, and may also be a more efficient, way of obtaining audit evidence. For example, an auditor may choose not to perform a substantive procedure that involves technology-assisted analysis if the auditor cannot determine whether the procedure would be considered a test of details under existing standards.

2. How the Final Amendments Address the Need

The final amendments address the risk that the auditor may not obtain sufficient appropriate audit evidence when addressing one or more financial statement assertions. For example, the final amendments: (i) specify considerations for the auditor when items are

⁸⁵ See, e.g., Helen Brown-Liburd, Hussein Issa, and Danielle Lombardi, *Behavioral Implications of Big Data's Impact on Audit Judgment and Decision Making and Future Research Directions*, 29 *Accounting Horizons* 451 (2015) (discussing how irrelevant information may limit the value of data analysis). See also Financial Reporting Council, *Audit Quality*.

identified for further investigation as part of performing a test of details;⁸⁶ (ii) specify procedures the auditor should perform to evaluate the reliability of information the company receives from one or more external sources and that is provided to the auditor in electronic form and used as audit evidence;⁸⁷ and (iii) clarify that if the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure.⁸⁸

The final amendments also address the risk that auditors may choose not to perform audit procedures involving technology-assisted analysis by: (i) specifying responsibilities when performing tests of details;⁸⁹ and (ii) clarifying that an audit procedure may be used for more than one purpose.⁹⁰ Collectively, the amendments should lead auditors to perceive less risk of noncompliance with PCAOB standards when using technology-assisted analysis.

Economic Impacts

This section discusses the expected benefits and costs of the final amendments and potential unintended consequences. In the proposing release, the Board noted that it expected the economic impact of the amendments, including both benefits and costs, to be relatively modest. Some commenters disagreed with the characterization of costs and benefits as "modest," stating that both costs and benefits of technology-assisted analysis can be substantial. However, the Board did not attempt to describe the overall costs and benefits of the use of technology-assisted analysis, but rather the marginal impact of the final amendments. It is difficult to quantify the benefits and costs because the final amendments do not require the adoption of any specific tools

⁸⁶ See detailed discussion above.

⁸⁷ See detailed discussion above.

⁸⁸ See detailed discussion above.

⁸⁹ See detailed discussion above.

⁹⁰ See detailed discussion above.

for technology-assisted analysis or that the auditor perform technology-assisted analysis. Some firms may choose to increase their investments in technology, and others may choose to make minimal changes to their existing audit practices. In general, the Board expects that firms will incur costs to implement or expand the use of technology-assisted analysis if firms determine that the benefits of doing so justify the costs. The Board included qualitative references to the benefits and costs associated with the use of technology-assisted analysis, including those raised by commenters.

1. Benefits

The final amendments may lead auditors to design and perform audit procedures more effectively, because they clarify and strengthen requirements of AS 1105 and AS 2301 related to aspects of designing and performing audit procedures that involve technology-assisted analysis. More effective audit procedures may lead to higher audit quality, more efficient audits, lower audit fees, or some combination of the three. To the extent the amendments lead to higher audit quality, they should benefit investors and other financial statement users by reducing the likelihood that the financial statements are materially misstated, whether due to error or fraud.

An increase in audit quality should in turn benefit investors as they may be able to use the more reliable financial information to improve the efficiency of their capital allocation decisions (e.g., investors may more accurately identify companies with the strongest prospects for generating future risk-adjusted returns and allocate their capital accordingly). Some commenters stated that the proposed amendments would benefit investors and the general public by reducing audit failures. One commenter stated that the analysis in the proposing release appeared to suggest that existing financial information and audits are "less reliable." The Board's intent was not to suggest that existing audits are unreliable, but rather that the proposed amendments may

increase audit quality, which should in turn increase investors' confidence in the information contained in financial statements. In theory, if investors perceive less risk in capital markets generally, their willingness to invest in capital markets may increase, and thus the supply of capital may increase. An increase in the supply of capital could increase capital formation while also reducing the cost of capital to companies.⁹¹ The Board is unable to quantify in precise terms this potential benefit, which would depend both on how audit firms respond to the standard and on how their response affects audit quality, factors that are likely to vary across audit firms and across engagements. Auditors also are expected to benefit from the final amendments because the additional clarity provided by the amendments should reduce regulatory uncertainty and the associated compliance costs. Specifically, the final amendments should provide auditors with a better understanding of their responsibilities, which in turn should reduce the risk that auditors design and perform potentially unnecessary audit procedures (e.g., potentially duplicative audit procedures).

Most commenters agreed that the proposed amendments would allow auditors to design and perform audit procedures more effectively, ultimately leading to higher quality audits. Some commenters identified specific benefits to audit quality resulting from increased use of technology-assisted analysis, such as the ability to automate some repetitive tasks and to improve the performance of risk assessment procedures and fraud and planning procedures. One commenter stated that the proposed amendments could result in the ineffective use of analytics if there is implicit pressure for firms to adopt technology-assisted analysis without appropriately

⁹¹ See, e.g., Hanwen Chen, Jeff Zeyun Chen, Gerald J. Lobo, and Yanyan Wang, *Effects of Audit Quality on Earnings Management and Cost of Equity Capital: Evidence from China*, 28 *Contemporary Accounting Research* 892 (2011); Richard Lambert, Christian Leuz, and Robert E. Verrecchia, *Accounting Information, Disclosure, and the Cost of Capital*, 45 *Journal of Accounting Research* 385 (2007).

preparing for its use, and another stated that the proposed amendments may not change the likelihood of not obtaining sufficient appropriate audit evidence. As discussed below, the final amendments are principles-based and are intended to clarify auditors' responsibilities when using technology-assisted analysis.

The following discussion describes the benefits of key aspects of the final amendments that are expected to impact auditor behavior. To the extent that a firm has already incorporated aspects of the amendments into its methodology, some of the benefits described below would be reduced.⁹²

i. Decreasing the Likelihood of Not Obtaining Sufficient Appropriate Audit Evidence

The final amendments are expected to enhance audit quality by decreasing the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report. For example, the final amendments specify auditors' responsibilities for investigating items identified when performing a test of details. In another example, the final amendments specify auditors' responsibilities for evaluating the reliability of certain information provided by the company in electronic form and used as audit evidence. As a result, auditors may be more likely to obtain sufficient appropriate audit evidence when designing and performing audit procedures that use technology-assisted analysis, resulting in higher audit quality. As described above, the higher audit quality should benefit investors and other financial statement users by reducing the likelihood that the financial statements are materially misstated, whether due to error or fraud. These potential benefits to audit quality apply

⁹² See discussion above.

both to audit engagements where auditors currently incorporate technology-assisted analysis into their audit approach and audit engagements where auditors have been previously reluctant to use technology-assisted analysis because of the risk of noncompliance.

ii. Greater Use of Technology-Assisted Analysis

The final amendments may lead to some increase in the use of technology-assisted analysis by auditors when designing and performing multi-purpose audit procedures and tests of details. For example, the final amendments clarify the description of a "test of details." As a result of this clarification, auditors may make greater use of technology-assisted analysis when designing or performing tests of details because they may perceive a reduction in noncompliance risk.

Notwithstanding the associated fixed and variable costs, greater use of technology-assisted analysis by the auditor when designing or performing audit procedures may allow the auditor to perform engagements with fewer resources, which may increase the overall resources available to perform audits.⁹³ In economic terms, it may increase the supply of audit quality.⁹⁴ For example, obtaining sufficient appropriate audit evidence by using technology-assisted analysis may require fewer staff hours than obtaining the evidence manually. Current labor shortages of qualified individuals and decreases in accounting graduates and new CPA

⁹³ See below (discussing costs associated with greater use of technology-assisted analysis).

⁹⁴ For purposes of this discussion, "audit quality" refers to assurance on the financial statements provided by the auditor to the users of the financial statements. The "supply of audit quality" is the relationship between audit quality and incremental cost to the auditor. An "increase in the supply of audit quality" occurs when the incremental costs of audit quality decrease (e.g., due to technological advances) and the auditor is able to profitably provide more audit quality at a given cost.

examination candidates amplify the value of gathering sufficient appropriate audit evidence with fewer staff hours.⁹⁵

Apart from consideration of demands from the audited company, discussed in greater detail below, the efficiencies that may arise from greater utilization of technology-assisted analysis would be retained by the auditor in the form of higher profit. However, to better address regulatory, litigation, or reputational risks, the auditor may choose to redeploy engagement-level resources to other work. For example, auditors may shift staff resources to audit areas or issues that are more complex or require more professional judgment.⁹⁶

As a result of the greater use of technology-assisted analysis by auditors, some companies may be able to obtain a higher level of audit quality or renegotiate their audit fee, or both. The outcome would likely vary by company depending on the competitiveness of the company's local audit market and the company's audit quality expectations. For example, negotiating power may be smaller for larger multinational companies, which may have fewer auditor choices, than for smaller companies, which may have more auditor choices. Furthermore, some companies may expect their auditor to reassign engagement team staff resources from repetitive or less complex audit procedures to more judgmental aspects of the audit. Other companies may expect the engagement team to perform the audit with fewer firm resources (e.g., fewer billable hours). Some research suggests that most companies prefer audit fee reductions in response to their auditor's greater use of data analytics.⁹⁷

⁹⁵ See, e.g., AICPA Private Companies Practice Section, *2022 PCPS CPA Top Issues Survey (2022)*; AICPA, *2021 Trends: A Report on Accounting Education, the CPA Exam and Public Accounting Firms' Hiring of Recent Graduates (2021)*.

⁹⁶ See, e.g., Salijeni et al., *Big Data*.

⁹⁷ See Austin et al., *The Data Analytics Journey*.

Because the final amendments do not require the auditor to use technology-assisted analysis when designing and performing audit procedures, the associated benefits would likely be limited to cases where auditors determine that their benefits justify their costs, including any fixed costs required to update the auditor's approach (e.g., update methodologies, provide training). The fixed costs may be significant; however, some firms may have incurred some of these costs already.⁹⁸ Moreover, despite the continued tendency of companies to adopt ERP systems to house their accounting and financial reporting data, some companies' data may remain prohibitively difficult to obtain and analyze, thus limiting the extent to which the auditor can use technology-assisted analysis.⁹⁹ Some survey research also suggests that some firms lack sufficient staff resources to appropriately deploy data analysis.¹⁰⁰ Collectively, these private costs may deter some auditors from incorporating technology-assisted analysis into their audit approach and thereby reduce the potential benefits associated with greater use of technology-assisted analysis.

Some commenters suggested that audit fees are unlikely to decrease as a result of increased use of technology-assisted analysis due primarily to the costs involved with using technology-assisted analysis. One commenter stated that the Board's analysis in the proposal focused on reducing costs (which could put downward pressure on audit fees), and suggested that the analysis should focus instead on enabling auditors to shift resources to higher risk areas of the audit, which should increase audit quality. Another commenter urged the PCAOB not to

⁹⁸ See discussion above, discussing increased availability of data analytic tools at larger firms and Austin et al., *The Data Analytics Journey* 1908.

⁹⁹ See, e.g., Austin et al., *The Data Analytics Journey* 1906.

¹⁰⁰ See, e.g., Saligeni et. al, *Big Data* 108. See also CPA Canada, *Audit Data Analytics*. However, some more recent survey research suggests that auditors tend to agree that they have the technical expertise to deploy data analytics. See Eilifsen et al., *An Exploratory Study* 84.

include commentary that relates the greater use of technology-assisted analysis to lower audit fees on the grounds that the proposing release underestimated the costs to smaller firms of designing, implementing, and operating technology-assisted analysis. The commenter added that such commentary could have the unintended effect of encouraging firms to reduce costs and therefore choose to use analytics ineffectively or choose not to implement technology-assisted analysis. A different commenter noted that the "supposition that efficiencies would accrue to the firms, potentially impacting audit efficiencies or even audit fees, is beyond the Board's charge of improving audit quality." The Board acknowledged that there can be significant costs associated with the use of technology-assisted analysis, particularly with the initial implementation of technology-assisted analysis tools, which some firms may pass on to audited companies in the form of higher audit fees, at least in the short term. However, the Board noted that the final amendments do not require the use of technology-assisted analysis, and academic studies suggest that greater use of data analytics could reduce audit fees.¹⁰¹

One commenter stated that the PCAOB should be "agnostic" about the use of audit technology and should focus on audit quality rather than audit efficiency. The Board believes that the PCAOB's focus on audit quality does not preclude it from considering the effect of audit efficiency on the Board's stakeholders. Furthermore, audit efficiencies in one area may allow auditors to redeploy resources to other audit areas that are more complex or require more professional judgment, resulting in increased audit quality.

2. Costs

To the extent that firms make changes to their existing audit approaches as a result of the final amendments, they may incur certain fixed costs (i.e., costs that are generally independent of

¹⁰¹ See Austin et al., *The Data Analytics Journey* 1891.

the number of audits performed), including costs to: update audit methodologies, templates, and tools; prepare training materials; train their staff; and develop or purchase software. GNFs and some NAFs are likely to update their methodologies using internal resources, whereas other NAFs are likely to purchase updated methodologies from external vendors.

In addition, firms may incur certain engagement-level variable costs. For example, the final amendments related to evaluating whether certain information provided by the company in electronic form and used as audit evidence is reliable could require additional time and effort by engagement teams that use such information in performing audit procedures. This additional time, and therefore the resulting variable costs, may be less on integrated audits or financial-statement audits that take a controls reliance approach because, in these cases, internal controls over the information, including ITGCs and automated application controls, may already be tested. As another example, some firms may incur software license fees that vary by the number of users. To the extent that auditors incur higher costs to implement the amendments and can pass on at least part of the increased costs through an increase in audit fees, audited companies may also incur an indirect cost.

Some commenters stated that they do not believe the fixed and variable cost increases will be modest as stated in the proposal, and that the evolution of technology-assisted analysis may render tools and training obsolete, requiring renewed investment at regular intervals. One of these commenters referenced increased resource costs such as the need to investigate items identified through technology-assisted analysis. One commenter stated that the proposing release mischaracterized the costs to NAFs of implementing technology-assisted analysis. This commenter noted that costs could include a learning curve for new technology adoption, increased costs of hiring engagement team members with appropriate skill sets, obtaining

reliable data, and the development or purchase of software tools. Another stated that some audit firms already use technology, so both costs and benefits would be modest for those firms. As the Board discussed in the proposal and as reiterated above, the final amendments do not require the use of technology-assisted analysis. Therefore, the costs discussed by these commenters would occur only if firms determined it was in their best interest to incur them.

Some aspects of the final amendments may result in more or different costs than others. The following discussion describes the potential costs associated with specific aspects of the amendments.

i. Potential Additional Audit Procedures and Implementation Costs

The final amendments clarify and specify auditor responsibilities when designing and performing audit procedures that involve technology-assisted analysis. As a result, some auditors may perform incremental procedures to comply with the final amendments, which may lead to incremental costs. For example, in addition to applying technology-assisted analysis when testing specific items in the population, some auditors may address the items not selected for testing by performing other substantive procedures if the auditor determines that there is a reasonable possibility of a risk of material misstatement in the items not selected for testing (i.e., the remaining population). To the extent that auditors currently do not fulfill their responsibilities under existing PCAOB standards related to the remaining population when there is a reasonable possibility of a risk of material misstatement, those firms may incur one-time costs to update firm methodologies and ongoing costs related to fulfilling their responsibilities. In another example, an auditor may determine that incremental procedures are necessary to evaluate the reliability of external information provided by the company in electronic form.. These incremental procedures may apply to audit engagements where auditors currently incorporate

technology-assisted analysis into their audit approach, and audit engagements where auditors have been reluctant to use technology-assisted analysis due to the risk of noncompliance.

At the firm level, some firms may incur relatively modest fixed costs to update their methodologies and templates (e.g., documentation templates) or customize their technology-based tools. Firms may also need to prepare training materials and train their staff. Firms may incur relatively modest variable costs if they determine that additional time and effort on an individual audit engagement is necessary in order to comply with the final amendments. For example, a firm may incur additional variable costs to investigate items identified when performing a test of details.

ii. Greater Use of Technology-Assisted Analysis

As discussed above, the final amendments do not require the use of technology-assisted analysis in an audit. However as noted above, the final amendments may lead to some increase in the use of technology-assisted analysis by auditors when designing and performing multi-purpose audit procedures and tests of details. The greater use of technology-assisted analysis by the auditor may allow the auditor to perform engagements with fewer resources. However, this potential efficiency benefit would likely be offset, in part, by fixed and variable costs to the audit firm. Fixed costs may be incurred to incorporate technology-assisted analysis into the audit approach. For example, some firms may purchase, develop, or customize new tools.¹⁰² Some firms may choose to hire programmers to develop tools internally. Firms may also incur fixed costs to obtain an understanding of companies' information systems.¹⁰³ Some commenters stated

¹⁰² See Financial Reporting Council, *Audit Quality*. See also Austin et al., *The Data Analytics Journey* 1908.

¹⁰³ See Eilifsen et al., *An Exploratory Study* 71 (discussing how audit data analytics are used less often when the company does not have an integrated ERP/IT system). See also Financial Reporting Council, *Audit Quality*.

that the costs to research, develop, and implement technology-assisted analysis can be significant. They also stated that rapid technological advancements require continual investment by audit firms to keep pace. Because the final amendments do not require the adoption of technology-assisted analysis, any such investments by firms would be made only if they determine that the benefits justify the costs.

Relatively modest variable costs may be incurred to use technology-assisted analysis on individual audit engagements. For example, firms may incur variable costs associated with preparing company data for analysis or updating their technology-based tools. Several commenters stated that there are costs associated with obtaining or preparing data in a format that can be utilized by specific tools for technology-assisted analysis. In another example, a firm may incur variable costs to obtain specialized expertise for using technology-assisted analysis on audit engagements. For example, a firm data analytics specialist may be used on an audit engagement to automate certain aspects of data preparation or design and perform a custom technology-assisted analysis. One commenter noted that the investigation of items identified by technology-assisted analysis requires resources such as the involvement of personnel who are skilled in interpreting the results of technology-assisted analysis. As a result, according to the commenter, the use of technology-assisted analysis may not necessarily reduce costs and may increase costs. As discussed above, auditors may increase audit fees due to costs associated with the use of technology-assisted analysis, passing along some of those costs to audited companies.

Several factors may limit the costs associated with greater use of technology-assisted analysis in an audit. First, the costs would likely be incurred by a firm only if it determined that the private benefits to it would exceed the private costs. Second, some firms have already made

investments to incorporate technology-assisted analysis in audits. Finally, the cost of software that can process and analyze large volumes of data has been decreasing.¹⁰⁴

3. Potential Unintended Consequences

In addition to the benefits and costs discussed above, the final amendments could have unintended economic impacts. The following discussion describes potential unintended consequences considered by the Board and, where applicable, factors that mitigate them. These include actions taken by the Board as well as the existence of other countervailing forces.

i. Reduction in the Use of Technology-Assisted Analysis

It is possible that, as a result of the final amendments, some auditors could reduce their use of technology-assisted analysis. This could occur if the final amendments were to lead firms to conclude that the private benefits would not justify the private costs of involving technology-assisted analysis in their audit approach. For example, the final amendments specify considerations for investigating items identified by the auditor when performing a test of details and procedures for evaluating the reliability of certain information the company receives from one or more external sources and used as audit evidence. As discussed above, such additional responsibilities could lead to fixed costs at the firm level and variable costs at the engagement level. As a result, some auditors may choose not to use audit procedures that involve technology-assisted analysis.

Several factors would likely mitigate any negative effects associated with this potential unintended consequence. First, the Board believes that any decrease in the use of technology-assisted analysis would likely arise from a reduction in the performance of audit procedures that would not have contributed significantly to providing sufficient appropriate audit evidence. This

¹⁰⁴ See discussion above.

development would therefore probably benefit, rather than detract from, audit quality. For example, currently some auditors might not appropriately investigate items identified when using technology-assisted analysis in performing tests of details. The amendments specify auditors' responsibilities for investigating the items identified. If auditors view the requirement as too costly to implement, they may instead choose to perform audit procedures that do not involve the use of technology-assisted analysis. If the other procedures chosen by the auditor provide sufficient appropriate audit evidence, the reduction in the performance of audit procedures that involve technology-assisted analysis (where auditors did not appropriately investigate items identified) would benefit audit quality.

Second, any reduction in the use of technology-assisted analysis resulting from certain of the amendments, such as in the above scenario, may be offset by the greater use of technology-assisted analysis in other scenarios. For example, as discussed above, the final amendments clarify the description of a "test of details." As a result, auditors may make greater use of technology-assisted analysis in performing tests of details because they may perceive a reduction in noncompliance risk.

Finally, because the final amendments are principles-based, auditors will be able to tailor their work subject to the amendments to the facts and circumstances of the audit. For example, the amendments do not prescribe procedures for investigating items identified when performing a test of details. Rather, the auditor will be able to structure the investigation based on, among other things, the type of analysis and the assessed risks of material misstatement.¹⁰⁵

Some commenters stated that the proposed amendments could potentially deter auditors from using technology-assisted analysis; in contrast, others said that the proposed amendments

¹⁰⁵ See discussion above.

could potentially pressure auditors to use technology-assisted analysis. As outlined above, the final amendments, consistent with the proposal, do not require the use of technology-assisted analysis, and the Board believes that auditors will use technology-assisted analysis to the extent that it allows them to perform audit procedures in a more efficient or effective manner. Some commenters expressed appreciation for PCAOB standards that allow auditors to employ appropriate audit procedures based on the facts and circumstances of the audit engagement. They agreed with the scalable, principles-based approach that allows for use of technology-assisted analysis to the extent that it is effective and efficient, taking into consideration the firm size, company size, and other circumstances of the audit engagement.

ii. Inappropriately Designed Multi-Purpose Audit Procedures

It is possible that some auditors could view the final amendments as allowing any audit procedure that involves technology-assisted analysis to be considered a multi-purpose procedure. Auditors who hold this view may fail to design and perform audit procedures that provide sufficient appropriate audit evidence. This potential unintended consequence would be mitigated by: (i) existing requirements of PCAOB standards; and (ii) the amendment to paragraph .14 of AS 1105.

Existing PCAOB standards address auditors' responsibilities for designing and performing procedures to identify, assess, and respond to risks of material misstatement and obtaining sufficient appropriate audit evidence.¹⁰⁶ Auditor responsibilities established by existing PCAOB standards apply to the performance of both audit procedures that are designed to achieve a single objective and audit procedures that are designed to achieve multiple objectives. Further, existing standards specify auditor responsibilities in certain scenarios that involve multi-purpose

¹⁰⁶ See, e.g., AS 2110 and AS 2301.

audit procedures. For example, existing PCAOB standards provide that an audit procedure may serve as both a risk assessment procedure and a test of controls provided that the auditor meets the objectives of both procedures.¹⁰⁷ In another example, existing PCAOB standards provide that audit procedures may serve as both a test of controls and a substantive procedure provided that the auditor meets the objectives of both procedures.¹⁰⁸

In addition, the amendment to paragraph .14 of AS 1105 would further mitigate the risk that auditors fail to design and perform multi-purpose audit procedures. The amendment would emphasize the auditor's responsibility to achieve particular objectives specified in existing PCAOB standards when using audit evidence from an audit procedure for multiple purposes.

iii. Disproportionate Impact on Smaller Firms

It is possible that the costs of the final amendments could disproportionately impact smaller firms. As discussed in Section IV.C.2 above, increased use of technology-assisted analysis may require incremental investment and specialized skills. Smaller firms have fewer audit engagements over which to distribute fixed costs (i.e., they lack economies of scale). As a result, smaller firms may be less likely than larger firms to increase their use of technology-assisted analysis when designing and performing multi-purpose audit procedures and tests of details. Although the final amendments do not require auditors to use technology-assisted analysis, a choice not to use it may negatively impact smaller firms' ability to compete with larger firms (e.g., if using technology-assisted analysis is expected by prospective users of the auditor's report). One commenter stated that the costs of using technology-assisted analysis could

¹⁰⁷ See AS 2110.39.

¹⁰⁸ See AS 2301.47.

be significant and cause audits performed by small and mid-sized accounting firms to be uneconomical.

This potential unintended negative consequence would be mitigated by several factors. First, the fixed costs associated with the amendments may be offset by engagement-level efficiencies which may increase the competitiveness of smaller firms. Second, as discussed above, the costs associated with acquiring and incorporating technology-based analytical tools into firms' audit approaches have been decreasing and may continue to decrease. Third, while reduced competition may result in higher audit fees,¹⁰⁹ it may also reduce companies' opportunity to opinion shop, thereby positively impacting audit quality.¹¹⁰ In contrast, some literature suggests that reduced competition may have a negative effect on audit quality.¹¹¹

Finally, any negative impact on the smaller firms' ability to compete with larger firms would likely be limited to smaller and mid-sized companies because smaller firms may lack the economies of scale and multi-national presence to compete for the audits of larger companies. Indeed, there is some evidence that smaller and larger audit firms do not directly compete with

¹⁰⁹ See, e.g., Joshua L. Gunn, Brett S. Kawada, and Paul N. Michas, *Audit Market Concentration, Audit Fees, and Audit Quality: A Cross-Country Analysis of Complex Audit Clients*, 38 *Journal of Accounting and Public Policy* 1 (2019).

¹¹⁰ See, e.g., Nathan J. Newton, Julie S. Persellin, Dechun Wang, and Michael S. Wilkins, *Internal Control Opinion Shopping and Audit Market Competition*, 91 *The Accounting Review* 603 (2016); Nathan J. Newton, Dechun Wang, and Michael S. Wilkins, *Does a Lack of Choice Lead to Lower Quality?: Evidence from Auditor Competition and Client Restatements*, 32 *Auditing: A Journal of Practice & Theory* 31 (2013).

¹¹¹ See, e.g., Jeff P. Boone, Inder K. Khurana, and K.K. Raman, *Audit Market Concentration and Auditor Tolerance for Earnings Management*, *Contemporary Accounting Research* 29 (2012); Nicholas J. Hallman, Antonis Kartapanis, and Jaime J. Schmidt, *How Do Auditors Respond to Competition? Evidence From the Bidding Process*, *Journal of Accounting and Economics* 73 (2022).

each other in some segments of the audit market¹¹² although some research suggests that smaller and larger firms do compete locally in some cases.¹¹³

Alternatives Considered

The development of the final amendments involved considering numerous alternative approaches to addressing the problems described above. This section explains: (i) why standard setting is preferable to other policy-making approaches, such as providing interpretive guidance or enhancing inspection or enforcement efforts; (ii) other standard-setting approaches that were considered; and (iii) key policy choices made by the Board in determining the details of the amendments.

1. Why Standard Setting is Preferable to Other Policy-Making Approaches

The Board's policy tools include alternatives to standard setting, such as issuing interpretive guidance or increasing the focus on inspections or enforcement of existing standards. The Board considered whether providing guidance or enhancing inspection or enforcement efforts would be effective mechanisms to address concerns associated with aspects of designing and performing audit procedures that involve technology-assisted analysis. One commenter stated that PCAOB staff guidance would be preferable to standard setting to communicate the requirements. Several commenters stated that additional guidance and examples would be helpful for auditors when applying existing standards and the proposed amendments when performing audit procedures that involve technology-assisted analysis.

¹¹² See, e.g., GAO Report No. GAO-03-864, *Public Accounting Firms: Mandated Study on Consolidation and Competition* (July 2003).

¹¹³ See, e.g., Kenneth L. Bills and Nathaniel M. Stephens, *Spatial Competition at the Intersection of the Large and Small Audit Firm Markets*, 35 *Auditing: A Journal of Practice and Theory* 23 (2016).

Interpretive guidance inherently provides additional information about existing standards. Inspection and enforcement actions take place after insufficient audit performance (and potential investor harm) has occurred. Devoting additional resources to interpretive guidance, inspections, or enforcement activities, without improving the relevant performance requirements for auditors, would at best focus auditors' performance on existing standards and would not provide the benefits associated with improving the standards, which are discussed above.

The In contrast, some literature suggests that reduced competition may have a negative effect on audit quality.amendments, by contrast, are designed to improve PCAOB standards by adding further clarity and specificity to existing requirements. For example, the amendments specify auditor responsibilities for evaluating the reliability of external information provided by the company in electronic form and used as audit evidence. In another example, the amendments clarify auditor responsibilities when the auditor uses an audit procedure for more than one purpose.

2. Other Standard-Setting Approaches Considered

The Board considered, but decided against, developing a standalone standard that would address designing and performing audit procedures that involve technology-assisted analysis. Addressing the use of technology-assisted analysis in a standalone standard could further highlight the auditor's responsibilities relating to using technology-assisted analysis. However, a new standalone standard would also unnecessarily duplicate many of the existing requirements, because existing PCAOB standards are already designed to be applicable to audits performed with the use of technology, including technology-assisted analysis.

Further, as the discussion above explains in greater detail, the Board's research indicates that auditors are using technology-assisted analysis in audit procedures. Rather than developing a

new standalone standard, the final amendments use a more targeted approach that includes amending certain requirements of the standards where the Board's research has indicated the need for providing further clarity and specificity regarding designing and performing audit procedures that involve technology-assisted analysis.

3. Key Policy Choices

i. Investigating Certain Items Identified by the Auditor

As discussed above, auditors may use technology-assisted analysis to identify items within a population (e.g., transactions in an account) for further investigation when performing a test of details.¹¹⁴ The auditor's investigation may include, for example, examining documentary evidence for items identified through the analysis, or designing and performing other audit procedures to determine whether the items identified individually or in the aggregate indicate misstatements or deficiencies in the company's internal control over financial reporting.

The Board considered but did not prescribe specific audit procedures to investigate items identified by the auditor in the way described in the above examples. Instead, the final amendments specify that audit procedures that the auditor performs to investigate the identified items are part of the auditor's response to the risk of material misstatement. The auditor determines the nature, timing, and extent of such procedures in accordance with PCAOB standards. The Board also considered, but did not prescribe, specific audit procedures to address items not selected for a test of details (i.e., remaining items in the population) when the auditor's means of selecting items was selecting specific items. Although certain audit procedures may be effective to address the assessed risk under certain circumstances, other audit procedures may be more effective under different circumstances. Because of the wide range of both the analyses that

¹¹⁴ See detailed discussion above.

the auditor may perform to identify items for further investigation, and the potentially appropriate audit procedures that the auditor may perform to investigate them, the Board believes that an overly prescriptive standard could in certain cases lead auditors to perform audit procedures without considering the facts and circumstances of the audit engagement.

ii. Describing a New Specific Audit Procedure

The Board considered but did not describe (or define), technology-assisted analysis or similar terms (e.g., data analysis or data analytics) in AS 1105 as a new specific audit procedure. Although describing technology-assisted analysis as a specific audit procedure might clarify certain auditor responsibilities, it could also create confusion and unnecessarily constrain the potential use of such analyses in the audit. As the Board's research indicates, and as commenters have stated, auditors already incorporate technology-assisted analysis in various types of audit procedures (e.g., inspection, recalculation, reperformance, analytical procedures) that are used for various purposes (e.g., identifying risk or responding to risk). In addition, describing technology-assisted analysis or similar terms would present challenges because the meaning of such terms may vary depending on the context and may further evolve as technology evolves.

iii. Requiring Auditors' Use of Technology

The final amendments, consistent with existing PCAOB standards, are principles-based and are intended to be applicable to all audits conducted under PCAOB standards. An investor-related group commented that the Board should consider requiring that auditors use certain types of technology-based tools that financial research and investment management firms have used to assess and verify the accuracy and completeness of financial statements, in order to improve audit quality and help detect fraud. In contrast, some commenters noted that requiring the use of certain technology could have unintended consequences for smaller companies and affect the

ability of smaller firms to compete. As one commenter noted, clients of small and mid-sized accounting firms may rely on other processes appropriate to their size to manage their operations and financial reporting, and the use of technology-assisted analysis may not be as cost-effective in those circumstances. Another commenter noted that it is important that PCAOB standards continue to enable auditors to employ audit procedures that are appropriate based on the engagement-specific facts and circumstances, recognizing that technology-assisted analysis may not be the most effective option and therefore its use should not be expected on all audits. That commenter emphasized the need for the proposed amendments to be scalable for firms (and the companies they audit) of all sizes and with varying technological resources. Several other commenters stated that the principles-based nature of the proposed amendments was important, so that they can be applicable to all PCAOB-registered firms and the audits they conduct under PCAOB standards, regardless of the size of the firm or complexity of the issuer.

The Board considered the views of commenters, including those of investors, and the Board decided not to require auditors' use of technology as part of these amendments, which would have been outside the scope of the project. Maintaining a principles-based approach to these amendments is appropriate due to the ever-evolving nature of technology; requiring the use of specific types of technology, based on how they are used currently, could quickly become outdated. In addition, as discussed above, the Board's Technology Innovation Alliance Working Group continues to advise the Board on the use of emerging technologies by auditors and preparers relevant to audits and their potential impact on audit quality. These ongoing activities may inform future standard-setting projects.

APPLICATION OF THE PROPOSED RULES TO AUDITS OF EMERGING GROWTH COMPANIES

Pursuant to Section 104 of the Jumpstart Our Business Startups ("JOBS") Act, rules adopted by the Board subsequent to April 5, 2012, generally do not apply to the audits of emerging growth companies (i.e., EGCs), as defined in Section 3(a)(80) of the Exchange Act, unless the SEC "determines that the application of such additional requirements is necessary or appropriate in the public interest, after considering the protection of investors, and whether the action will promote efficiency, competition, and capital formation."¹¹⁵ As a result of the JOBS Act, the rules and related amendments to PCAOB standards that the Board adopts are generally subject to a separate determination by the SEC regarding their applicability to audits of EGCs.

To inform consideration of the application of auditing standards to audits of EGCs, the PCAOB staff prepares a white paper annually that provides general information about characteristics of EGCs.¹¹⁶ As of the November 15, 2022, measurement date in the February 2024 EGC White Paper, PCAOB staff identified 3,031 companies that self-identified with the SEC as EGCs and filed with the SEC audited financial statements in the 18 months preceding the measurement date.¹¹⁷

¹¹⁵ See Pub. L. No. 112-106 (Apr. 5, 2012). See also Section 103(a)(3)(C) of Sarbanes-Oxley, as added by Section 104 of the JOBS Act (providing that any rules of the Board requiring: (1) mandatory audit firm rotation; or (2) a supplement to the auditor's report in which the auditor would be required to provide additional information about the audit and the financial statements of the issuer (auditor discussion and analysis), shall not apply to an audit of an EGC. The amendments do not fall within either of these two categories).

¹¹⁶ See PCAOB, *White Paper on Characteristics of Emerging Growth Companies and Their Audit Firms at November 15, 2022* (Feb. 20, 2024) ("EGC White Paper"), available at <https://pcaobus.org/resources/other-research-projects>.

¹¹⁷ The EGC White Paper uses a lagging 18-month window to identify companies as EGCs. Please refer to the "Current Methodology" section in the white paper for details. Using an 18-month window enables staff to analyze the characteristics of a fuller population in the EGC White Paper but may tend to result in a larger number of EGCs being included for purposes of the present EGC analysis than would alternative methodologies. For example, an estimate using a lagging 12-month window would exclude some EGCs that are delinquent in making periodic filings. An estimate as of the measurement date would exclude EGCs that have terminated their registration, or that have exceeded the eligibility or time limits. See *id.*

As discussed above, auditors are expanding the use of technology-assisted analysis in audits. The final amendments, as discussed above, address aspects of designing and performing audit procedures that involve technology-assisted analysis. The proposed rules are principles-based and are intended to be applied in all audits performed pursuant to PCAOB standards, including audits of EGCs.

The discussion of benefits, costs, and unintended consequences of the proposed rules above is generally applicable to all audits performed pursuant to PCAOB standards, including audits of EGCs. The economic impacts on an individual EGC audit would depend on factors such as the auditor's ability to distribute implementation costs across its audit engagements, whether the auditor has already incorporated technology-assisted analysis into its audit approach, and electronic information acquisition challenges (e.g., information availability, legal restrictions, or privacy concerns). EGCs are more likely to be newer companies, which are typically smaller in size and receive lower analyst coverage. These factors may increase the importance to investors of the higher audit quality resulting from the proposed rules, as high-quality audits generally enhance the credibility of management disclosures.¹¹⁸

¹¹⁸ Researchers have developed a number of proxies that are thought to be correlated with information asymmetry, including small company size, lower analyst coverage, larger insider holdings, and higher research and development costs. To the extent that EGCs exhibit one or more of these properties, there may be a greater degree of information asymmetry for EGCs than for the broader population of companies, which increases the importance to investors of the external audit to enhance the credibility of management disclosures. *See, e.g.,* Steven A. Dennis and Ian G. Sharpe, *Firm Size Dependence in the Determinants of Bank Term Loan Maturity*, 32 *Journal of Business Finance & Accounting* 31 (2005); Michael J. Brennan and Avanidhar Subrahmanyam, *Investment Analysis and Price Formation in Securities Markets*, 38 *Journal of Financial Economics* 361 (1995); David Aboody and Baruch Lev, *Information Asymmetry, R&D, and Insider Gains*, 55 *The Journal of Finance* 2747 (2000); Raymond Chiang and P. C. Venkatesh, *Insider Holdings and Perceptions of Information Asymmetry: A Note*, 43 *The Journal of Finance* 1041 (1988); Molly Mercer, *How Do Investors Assess the Credibility of Management Disclosures?*, 18 *Accounting Horizons* 185 (2004).

However, as discussed above, the use of technology-assisted analysis appears to be less prevalent among NAFs than GNFs. Therefore, since EGCs are more likely than non-EGCs to be audited by NAFs, the impacts of the proposed rules on EGC audits may be less than on non-EGC audits.¹¹⁹

The proposed rules could impact competition in an EGC's product market if the indirect costs to audited companies disproportionately impact EGCs relative to their competitors. However, as discussed above, the costs associated with the proposed rules are expected to be relatively modest. Therefore, the impact of the proposed rules on competition, if any, is likewise expected to be limited.

Overall, the proposed rules are expected to enhance the efficiency and quality of EGC audits that implement technology-assisted analysis and contribute to an increase in the credibility of financial reporting by those EGCs. To the extent the proposed rules improve EGCs' financial reporting quality, they may also improve the efficiency of capital allocation, lower the cost of capital, and enhance capital formation. For example, higher financial reporting quality may allow investors to more accurately identify companies with the strongest prospects for generating future risk-adjusted returns and reallocate their capital accordingly. Investors may also perceive less risk in EGC capital markets generally, leading to an increase in the supply of capital to EGCs. This may increase capital formation and reduce the cost of capital to EGCs. We are unable to quantify in precise terms this potential benefit, which would depend both on how audit firms respond to the standard and on how their response affects audit quality, factors that are likely to vary across audit firms and across engagements.

¹¹⁹ Staff analysis indicates that, compared to exchange-listed non-EGCs, exchange-listed EGCs are approximately 2.6 times as likely to be audited by an NAF and approximately 1.3 times as likely to be audited by a triennially inspected firm. Source: EGC White Paper and Standard & Poor's.

Furthermore, if certain of the proposed rules did not apply to the audits of EGCs, auditors would need to address differing audit requirements in their methodologies, or policies and procedures, with respect to audits of EGCs and non-EGCs. This could create the potential for additional confusion.

Two commenters on the proposal specifically supported the application of the amendments to EGCs. One of those commenters stated that excluding EGCs from the proposal would be inconsistent with protecting the public interest.

Accordingly, and for the reasons explained above, the Board will request that the Commission determine that it is necessary or appropriate in the public interest, after considering the protection of investors and whether the action will promote efficiency, competition, and capital formation, to apply the proposed rules to audits of EGCs.

III. Date of Effectiveness of the Proposed Rules and Timing for Commission Action

Within 45 days of the date of publication of this notice in the *Federal Register* or within such longer period (i) as the Commission may designate up to 90 days of such date if it finds such longer period to be appropriate and publishes its reasons for so finding or (ii) as to which the Board consents, the Commission will:

- (A) By order approve or disapprove such proposed rules; or
- (B) Institute proceedings to determine whether the proposed rules should be disapproved.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views and arguments concerning the foregoing, including whether the proposed rules are consistent with the requirements of Title I of the Act. Comments may be submitted by any of the following methods:

Electronic comments:

- Use the Commission's internet comment form (<https://www.sec.gov/rules/pcaob>); or
- Send an e-mail to rule-comments@sec.gov. Please include PCAOB-2024-03 on the subject line.

Paper comments:

- Send paper comments in triplicate to Vanessa A. Countryman, Secretary, Securities and Exchange Commission, 100 F Street, NE, Washington, DC 20549-1090.

All submissions should refer to PCAOB-2024-03. This file number should be included on the subject line if e-mail is used. To help the Commission process and review your comments more efficiently, please use only one method. The Commission will post all comments on the Commission's internet website (<https://www.sec.gov/rules/pcaob>). Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rules that are filed with the Commission, and all written communications relating to the proposed rules between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for website viewing and printing in the Commission's Public Reference Room, 100 F Street, NE, Washington, DC 20549, on official business days between the hours of 10 a.m. and 3 p.m. Copies of such filing will also be available for inspection and copying at the principal office of the PCAOB. Do not include personal identifiable information in submissions; you should submit only information that you wish to make available publicly. We may redact in part or withhold entirely from publication submitted material that is obscene or subject to copyright protection. All submissions should refer to PCAOB-2024-03 and should be submitted on or before [INSERT DATE 21 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

By the Commission.

Vanessa Countryman
Secretary



Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

PCAOB Release No. 2023-004
June 26, 2023

PCAOB Rulemaking
Docket Matter No. 052

Summary: The Public Company Accounting Oversight Board (PCAOB or the “Board”) is proposing to amend AS 1105, *Audit Evidence* and AS 2301, *The Auditor’s Responses to the Risks of Material Misstatement*, and to make conforming amendments to other related PCAOB auditing standards. Since the standards were originally issued, auditors have expanded their use of technology-assisted analysis of information in electronic form in audits. The amendments are designed to improve audit quality and enhance investor protection by addressing aspects of designing and performing audit procedures that involve technology-assisted analysis of information in electronic form.

Public

Comment: Interested persons may submit written comments to the Board. Comments should be sent via e-mail to comments@pcaobus.org or through the Board’s website at www.pcaobus.org. Comments may also be sent to the Office of the Secretary, PCAOB, 1666 K Street, NW, Washington, DC 20006-2803. All comments should refer to PCAOB Rulemaking Docket Matter No. 052 in the subject or reference line and should be received by the Board by August 28, 2023.

Board

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APPENDICES

 1. APPENDIX 1 – PROPOSED AMENDMENTS

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I. EXECUTIVE SUMMARY

We are proposing amendments to AS 1105, *Audit Evidence* and AS 2301, *The Auditor's Responses to the Risks of Material Misstatement* (the "proposed amendments"), and conforming amendments to other related PCAOB auditing standards. The proposed amendments are designed to improve audit quality and enhance investor protection by addressing the growing use of certain technology in audits. In particular, the amendments would update PCAOB auditing standards to more specifically address aspects of designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools (i.e., technology-assisted analysis). Increasingly, registered public accounting firms obtain audit evidence by analyzing large volumes of information in electronic form. The proposed updating of PCAOB standards is designed to increase the likelihood that audit procedures performed with the use of technology-assisted analysis provide sufficient appropriate audit evidence to support the opinion expressed in the auditor's report.

Staff Research

The proposed amendments described in this release are informed by the PCAOB staff's research project on *Data and Technology*. The staff's research has involved gathering information from PCAOB oversight activities, reviewing firm methodologies, engaging with preparers of financial statements, investors, academics, and other stakeholders on their experiences with data and technology, and monitoring the activities of other audit standard setters and regulators.

Use of Technology-Assisted Analysis in the Audit

Our research indicates that some auditors are expanding their use of technology-assisted analysis (often referred to in practice as "data analysis" or "data analytics") to perform specific audit procedures that are described in existing AS 1105. These procedures include, for example, inspecting company information in electronic form by examining the correlation between different types of transactions, comparing company information to third-party information, performing analytical procedures by comparing an auditor's expectation to the company's recorded balances or transactions, or recalculating company information. Auditors use technology-assisted analysis in many audit areas, including those involving significant risks of material misstatement to financial statements due to error or fraud.

Why the Board is Proposing These Changes Now

Existing PCAOB standards relating to audit evidence and responses to risk (AS 1105 and AS 2301) discuss certain fundamental areas of auditor responsibilities, which include addressing the risk of material misstatement to the financial statements by obtaining sufficient appropriate audit evidence. Since the standards were issued by the Board in 2010, advancements in technology have enabled auditors to expand the use of technology-assisted analysis in audits. If

not designed and executed in accordance with PCAOB standards, audit procedures that involve analyzing information in electronic form with technology-based tools may not provide sufficient appropriate audit evidence. Our research indicates that AS 1105 and AS 2301 may be more effective if they more specifically address aspects of audit procedures that involve technology-assisted analysis.

Key Provisions of the Proposed Amendments

The Board's proposal would further specify and clarify auditor responsibilities by amending certain requirements of AS 1105 and AS 2301. The proposed amendments are designed to reduce the likelihood that an auditor who uses technology-assisted analysis will issue an opinion without having obtained relevant and reliable audit evidence. The proposed amendments are principles-based and therefore are intended to be adaptable to the ever-evolving nature of technology. The Board's proposal is focused on addressing aspects of technology-assisted analysis and does not address other technology applications used in audits (e.g., blockchain or artificial intelligence) or the evaluation of the appropriateness of tools by the firm's system of quality control. In particular, the proposed amendments would:

- Specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive audit procedures;
- Specify that if an auditor uses audit evidence from an audit procedure for more than one purpose the procedure needs to be designed and performed to achieve each of the relevant objectives;
- Provide additional details regarding auditor responsibilities for evaluating the reliability of external information maintained by the company in electronic form and used as audit evidence;
- Clarify the differences between tests of details and analytical procedures, and emphasize the importance of appropriate disaggregation or detail of information to the relevance of audit evidence; and
- Update certain terminology in AS 1105 to reflect the greater availability of information in electronic form and improve the consistency of the use of such terminology throughout the standard.

This release provides background on the Board's standard-setting project, discusses the proposed amendments, and includes an economic analysis that further considers the need for standard setting and the anticipated economic impacts of our proposed approach. The release also includes two appendices. Appendix 1 sets forth the text of the proposed amendments. Appendix 2 includes conforming amendments to other related PCAOB auditing standards.

Requesting Public Comment on Our Proposal

We are seeking comment on the proposed amendments and conforming amendments to other PCAOB auditing standards. Throughout the release we have included detailed questions soliciting your feedback on specific aspects of our proposal. You are encouraged to comment on any or all topics, respond to any or all questions, provide feedback in areas not covered by specific questions, and provide any evidence, including empirical evidence or your practical experiences, that informs your views.

Instructions on how to comment, including by e-mail or postal mail, can be found on the cover sheet of this release. Comments submitted can be found at the docket page of PCAOB Rulemaking Docket Matter No. 052.

II. BACKGROUND

In 2010, the Board adopted auditing standards related to the auditor's assessment of and response to risk (the "risk assessment standards"), including AS 1105 and AS 2301. Although the risk assessment standards were designed to apply to audits that involve the use of information technology by auditors, the use of information in electronic form¹ and technology-based tools by companies and their auditors to analyze such information has expanded significantly since these standards were developed.

In light of the increased use of technology by companies and auditors, in 2017 the Board added to its agenda a research project to assess whether there is a need for guidance, changes to PCAOB standards, or other regulatory actions. Among other things, research findings indicated that auditors have expanded their use of certain technology-based tools, including tools used to perform technology-assisted analysis (as described above, also referred to in practice as "data analytics" or "data analysis")² to plan and perform audits.³ In addition, research findings highlighted the importance to investor protection of addressing aspects of designing and performing audit procedures that involve technology-assisted analysis, which are discussed in this release.⁴ The remainder of this section of the release provides an overview of

¹ Within this proposal, the term "information in electronic form" encompasses items in electronic form that are described in PCAOB standards using terms such as "information," "data," "documents," "records," "accounting records," and "company's financial records."

² Within this proposal, the terms "data analysis" or "data analytics" are used synonymously, with the term used based on the terminology used by the source cited.

³ See PCAOB's *Data and Technology* research project, available at <https://pcaobus.org/oversight/standards/standard-setting-research-projects/data-technology>.

⁴ The detailed discussion of the proposed amendments is included in Section III of this release. It addresses: (a) clarifying the difference between tests of details and analytical procedures; (b) specifying

the staff's research, existing requirements, and current practice. In addition, it discusses reasons for improving the existing standards.

A. Overview of Staff Research

The proposed amendments described in this release are informed by the ongoing research conducted by PCAOB staff regarding auditors' use of technology as part of the *Data and Technology* research project.⁵ The research was conducted to assess whether there is a need for guidance, changes to PCAOB standards, or other regulatory actions considering the increased use of technology-based tools by auditors and preparers, and the increasing availability and use of information from sources external to the company being audited. Generally, commenters to the Board's Draft Strategic Plan supported the Board's efforts to evaluate developments in data and technology.

The staff's research has involved gathering information from PCAOB oversight activities, reviewing changes that audit firms have made to their policies and methodologies related to the use of technology-assisted analysis, and considering relevant academic research. In addition, the staff has engaged with preparers of financial statements, investors, academics, and other stakeholders on their experiences with data and technology, and monitored the activities of other audit standard setters and regulators. The research was also informed by the PCAOB Data and Technology Task Force, whose members provided valuable perspectives on the use of technology by auditors and preparers, as well as the application of PCAOB standards when using such technology in audits.⁶

The proposed amendments address only one area of auditors' use of technology – aspects of designing and performing audit procedures that involve technology-assisted analysis. Other areas continue to be addressed as part of the staff's ongoing research activities. In addition, we launched the Technology Innovation Alliance Working Group, which will advise the Board on the use of emerging technologies by auditors and preparers relevant to audits and

the auditor's responsibilities when audit evidence from an audit procedure is used for more than one purpose; (c) specifying considerations for the auditor's investigation of items when designing and performing substantive procedures; and (d) specifying responsibilities for evaluating the reliability of certain audit evidence.

⁵ See PCAOB's *Data and Technology* research project, available at <https://pcaobus.org/oversight/standards/standard-setting-research-projects/data-technology>.

⁶ See also *Spotlight: Data and Technology Research Project Update* (two updates published in 2020 and 2021), available at <https://pcaobus.org/resources/staff-publications>.

their potential impact on audit quality.⁷ These ongoing activities may inform future standard-setting projects.

B. Existing Requirements

The proposed amendments would modify certain requirements of PCAOB standards relating to audit evidence and responses to risk (AS 1105 and AS 2301). AS 1105 explains what constitutes audit evidence and establishes requirements regarding designing and performing audit procedures to obtain sufficient appropriate audit evidence. AS 2301 establishes requirements regarding designing and implementing appropriate responses to those identified and assessed risks of material misstatement. As noted above, these standards were written before advancements in technology enabled auditors to expand their use of technology-assisted analysis, and do not specifically address aspects of designing and performing audit procedures that involve such analysis.

The following discussion provides a high-level overview of the areas in PCAOB standards that would be addressed by the proposed amendments. Section III in this release provides additional details regarding the specific requirements that we propose to amend.

Classification of Audit Procedures (See Figure 1 below) – Under PCAOB standards, audit procedures can be classified into either risk assessment procedures or further audit procedures, that consist of tests of controls and substantive procedures. Substantive procedures include tests of details and substantive analytical procedures.⁸ Existing standards describe examples of specific audit procedures⁹ but do not specify what differentiates an analytical procedure from a test of details. PCAOB standards do not preclude the auditor from designing and performing audit procedures to accomplish more than one purpose. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.¹⁰

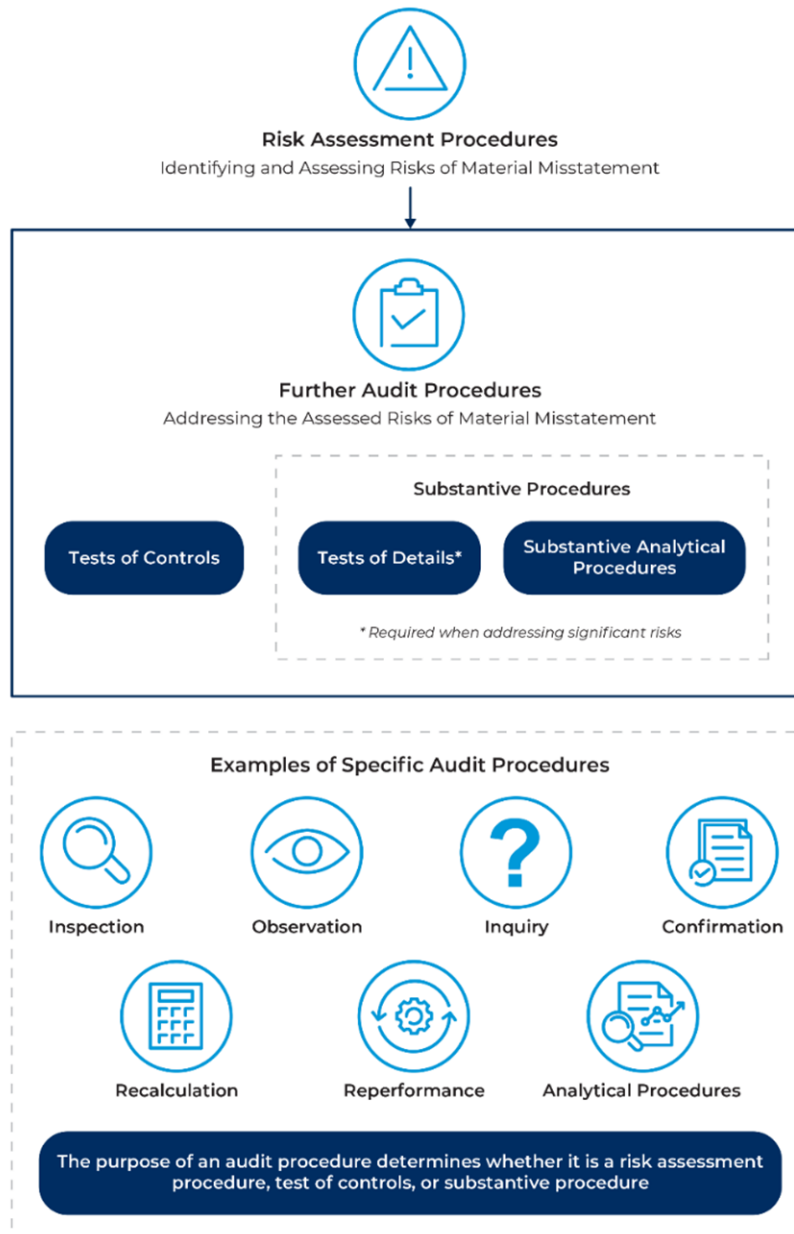
⁷ See *PCAOB Launches Technology Innovation Alliance Working Group*, available at <https://pcaobus.org/news-events/news-releases/news-release-detail/pcaob-launches-technology-innovation-alliance-working-group>.

⁸ See AS 1105.13.

⁹ See AS 1105.15-.21.

¹⁰ See AS 1105.14.

Figure 1. Classification of Audit Procedures



Investigation of Specific Items – Designing substantive tests of details and tests of controls includes determining the means of selecting items for testing. Under existing standards, when selecting items for testing, the auditor may use one or a combination of means, including selecting specific items, selecting a sample that is expected to be representative of the population (i.e., audit sampling), or selecting all items. The auditor may decide to select for testing specific items within a population because they are important to

accomplishing the objective of the audit procedure or because they exhibit some other characteristic.¹¹ Unlike with respect to the auditor's responsibilities for planning, performing, and evaluating samples that are representative of the population,¹² existing PCAOB standards do not specify auditor responsibilities for investigating items identified by the auditor based on criteria established when designing or performing a substantive audit procedure on all or part of a population.

Relevance and Reliability of Audit Evidence – Under PCAOB standards audit evidence is all the information, whether obtained from audit procedures or other sources, that is used by the auditor in arriving at the conclusions on which the auditor's opinion is based.¹³ PCAOB standards require auditors to plan and perform audit procedures to obtain sufficient appropriate audit evidence to provide a reasonable basis for their audit opinion. Sufficiency is the measure of the quantity of audit evidence, and appropriateness is the measure of its quality. To be appropriate, audit evidence must be both relevant and reliable in providing support for the auditor's conclusions.¹⁴ The relevance of audit evidence depends on the design and timing of the audit procedure used to test the assertion or control. The reliability of audit evidence depends on the nature and source of the evidence and the circumstances under which it is obtained, such as whether the information is provided to the auditor by the company being audited and whether the company's controls over that information are effective.¹⁵ In addition, when using information produced by the company as audit evidence, the auditor is responsible for evaluating whether the information is sufficient and appropriate for purposes of the audit.¹⁶ Existing PCAOB standards do not specify auditor responsibilities regarding external information in electronic form maintained by the company that the auditor uses as audit evidence.

C. Current Practice

Our research indicates that audit procedures involving technology-assisted analysis are an important component of many audits. The use of technology-assisted analysis has expanded over the last decade as more accounting firms, including smaller firms, incorporate such analysis as part of their audit procedures. However, the investment in and use of technology-

¹¹ See AS 1105.22-27.

¹² See AS 2315, *Audit Sampling*.

¹³ See AS 1105.02.

¹⁴ See AS 1105.04-.06.

¹⁵ See AS 1105.07-.08.

¹⁶ See AS 1105.10.

assisted analysis vary across registered firms and across individual audit engagements within a firm.¹⁷

The greater availability of both information in electronic form and technology-based tools to analyze such information has contributed significantly to the increase in the use of technology-assisted analysis by auditors. More companies use enterprise resource planning (ERP) and other information systems that maintain large volumes of information in electronic form, including information generated internally by the company and information that the company receives from external sources. Significant volumes of this information are available to auditors for use in their performance of audit procedures.

Powerful technology-based analysis tools to process and analyze large volumes of information have become more readily available to auditors. As a result, auditors often apply technology-assisted analysis to the entire population of transactions comprising one or more financial statement accounts. Our research indicates that auditors primarily use technology-assisted analysis when identifying and assessing risks of material misstatement to identify new risks or to refine the assessment of known risks. For example, by analyzing a full population of revenue transactions, an auditor may identify certain components of the revenue account as subject to higher risks or may identify new risks of material misstatement associated with sales to a particular customer or in a particular location.

Increasingly, some auditors have been using technology-assisted analysis in audit procedures that are performed to respond to assessed risks of material misstatement, including in substantive procedures. For example, such analysis has been used to identify and select for testing specific items included within the population or to test the details of all items in the population. PCAOB staff have observed that auditors use technology-assisted analysis mostly in the testing of revenue and related receivable accounts, inventory, journal entries, expected credit losses, and investments.¹⁸ As discussed in more detail below,¹⁹ some auditors use audit evidence obtained from such analysis to achieve more than one purpose.

Audit methodologies of several larger firms affiliated with global networks address the use of technology-assisted analysis by the firms' audit engagement teams. For example, the methodologies specify the audit engagement teams' responsibilities for: (i) designing and performing audit procedures that involve technology-assisted analysis (e.g., determining whether an audit procedure is a substantive procedure); (ii) evaluating analysis results (e.g., whether identified items indicate a misstatement or whether performing additional procedures

¹⁷ See also discussion in Section IV.A., below of this release.

¹⁸ See page 15 of *Spotlight: Staff Update and Preview of 2021 Inspection Observations*, available at https://pcaob-assets.azureedge.net/pcaob-dev/docs/default-source/documents/staff-preview-2021-inspection-observations-spotlight.pdf?sfvrsn=d2590627_2/.

¹⁹ See Section III.B of this release.

is necessary to obtain sufficient appropriate audit evidence); and (iii) evaluating the relevance and reliability of information used in the analysis.

D. Reasons to Improve the Auditing Standards

The proposed amendments have been developed to reduce the likelihood that the auditor does not obtain relevant and reliable audit evidence through audit procedures that involve technology-assisted analysis. Although the staff's research project on *Data and Technology* indicates that auditors are using technology-assisted analysis in audit procedures, it also indicates that existing standards do not specify aspects of designing and performing audit procedures that involve technology-assisted analysis. We have also heard from the Board's Investor Advisory Group that auditors' use of technology-assisted analysis is an area of concern due to potential overreliance by auditors on company-produced information, and that there could be a benefit in addressing the use of such analysis in the standards.²⁰

One commenter on the PCAOB's draft strategic plan noted, "[t]hroughout the Strategic Plan, technology is a constant theme as both an opportunity and risk for the PCAOB and the audit industry; we could not agree more. As investors, we have seen many examples of how technology can create incredible efficiencies and sometimes mayhem. We share the concerns of many stakeholders that some bad actors will utilize technology to cut corners, weakening audit quality to save money. As investors ultimately pay the audit bill, we support reducing the costs of audits, but not at the expense of audit quality."²¹

Using technology-assisted analysis may enhance the effectiveness and efficiency of audit procedures. For example, analyzing larger volumes of information and in more depth may better inform the auditor's risk assessment by providing different perspectives, exposing previously unidentified relationships that may reveal new risks, and providing more information when assessing risks. At the same time, inappropriate application of PCAOB standards when designing and performing audit procedures that involve technology-assisted analysis has the potential to compromise the quality of audits where the procedures are used. For example, PCAOB staff reviews of audits that involve technology-assisted analysis have found instances of

²⁰ See PCAOB Investor Advisory Group Meeting June 8, 2022, available at <https://pcaobus.org/news-events/events/event-details/pcaob-investor-advisory-group-meeting-2022>.

²¹ See page 2 of the Colorado Public Employees' Retirement Association comment letter on the PCAOB Draft 2022-2026 Strategic Plan, dated September 15, 2022, available at https://pcaob-assets.azureedge.net/pcaob-dev/docs/default-source/about/administration/strategic-plan-comments-2022/14_copera.pdf?sfvrsn=60d1eb76_4.

non-compliance with PCAOB standards related to evaluating the relevance and reliability of information in electronic form and evaluating certain items identified through the analysis.²²

The proposed modification of existing PCAOB standards would address aspects of designing and performing audit procedures that involve technology-assisted analysis where we have identified the need for additional specificity or clarity in the existing standards.²³ These aspects include areas where PCAOB reviews of audits have identified instances of noncompliance with PCAOB standards and areas where auditors have raised questions during our research regarding the applicability of PCAOB standards to the use of technology-assisted analysis. Section III below of this release discusses the proposed amendments in more detail. Section IV below discusses alternatives that we considered when developing the proposed amendments.

Questions:

1. Does the description of auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors' use of technology-assisted analysis that we should consider?
2. Does the release accurately describe aspects of designing and performing audit procedures involving technology-assisted analysis where improvements to PCAOB standards may be necessary?
3. In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?

²² See page 9 of *Spotlight: Staff Update and Preview of 2020 Inspection Observations*, and page 15 of *Spotlight: Staff Update and Preview of 2021 Inspection Observations*, available at <https://pcaobus.org/resources/staff-publications>.

²³ Other PCAOB standard-setting projects may address other aspects of firms' and auditors' use of technology in performing audits. For example, see paragraphs .44h and .47h of proposed QC 1000, *A Firm's System of Quality Control*, PCAOB Release No. 2022-006 (Nov. 18, 2022), which discusses a firm's responsibilities related to technological resources.

III. DISCUSSION OF THE PROPOSED AMENDMENTS

A. Clarifying the Differences Between Tests of Details and Analytical Procedures and Emphasizing the Importance of Appropriate Disaggregation or Detail of Information

See paragraphs .07, .13, and .21 of AS 1105 of the proposed amendments in Appendix 1.

The proposed amendments would further clarify the differences between tests of details and analytical procedures. They would also emphasize the importance of appropriate disaggregation or detail of information used as audit evidence.

Performing Substantive Procedures in Response to the Risks of Material Misstatement

Under PCAOB standards, the auditor's response to risks of material misstatement involves performing substantive procedures for each relevant assertion of each significant account and disclosure.²⁴ Substantive procedures under PCAOB standards include tests of details and substantive analytical procedures.²⁵ Appropriately designing and performing an audit procedure to achieve a particular objective is key to appropriately addressing the risks assessed by the auditor. For significant risks of material misstatement, including fraud risks, the auditor is required to perform tests of details that are specifically responsive to the assessed risk,²⁶ as it is unlikely that audit evidence obtained from substantive analytical procedures alone would be sufficient.²⁷

Analytical Procedures in PCAOB Standards

As described above, technology-assisted analysis is often referred to in practice as "data analytics" or "data analysis." The use of this terminology in practice and the use of the term "analytical procedures" in PCAOB standards have led to questions about whether an audit procedure involving technology-assisted analysis can be a test of details (i.e., not an analytical procedure as described under PCAOB standards). The distinction is important because, as explained above, PCAOB standards require that the auditor perform tests of details when responding to an assessed significant risk of material misstatement, (i.e., performing only analytical procedures would not be sufficient). The staff have observed that auditors use technology-assisted analysis in both audit procedures that fall under the definition of analytical procedures and those that involve testing the details of accounts and disclosures. Existing

²⁴ See AS 2301.36.

²⁵ See AS 1105.13b.

²⁶ See AS 2301.11 and .13, specifying the auditor's responsibilities for responses to significant risks, which include fraud risks.

²⁷ See paragraph .09 of AS 2305, *Substantive Analytical Procedures*.

standards describe what constitutes an analytical procedure,²⁸ but they do not describe what constitutes a test of details.

Currently, PCAOB standards describe analytical procedures as a specific type of audit procedure – an evaluation of financial information made by a study²⁹ of plausible relationships among both financial and nonfinancial data. Analytical procedures under existing PCAOB standards are performed to achieve various objectives throughout the audit (See Figure 2 below). For example, analytical procedures are performed as part of identifying and assessing risks of material misstatement,³⁰ and also as part of the auditor’s overall review of the financial statements.³¹ As noted above, analytical procedures also can be performed as a substantive procedure (i.e., a substantive analytical procedure) addressing an assessed risk of material misstatement.³² Substantive analytical procedures require a greater level of precision than analytical procedures performed as risk assessment procedures.³³

²⁸ See AS 1105.21 for the description of an analytical procedure.

²⁹ AS 1105.21, footnote 27 of AS 2110, *Identifying and Assessing Risks of Material Misstatement*, and AS 2305.02 refer to analytical procedures as a “study” of plausible relationships among both financial and nonfinancial data. The proposed amendments would amend these paragraphs by replacing the term “study” with “analysis” to align with current practice. In addition, the proposed amendments to these paragraphs would clarify that data can be either external or company-produced.

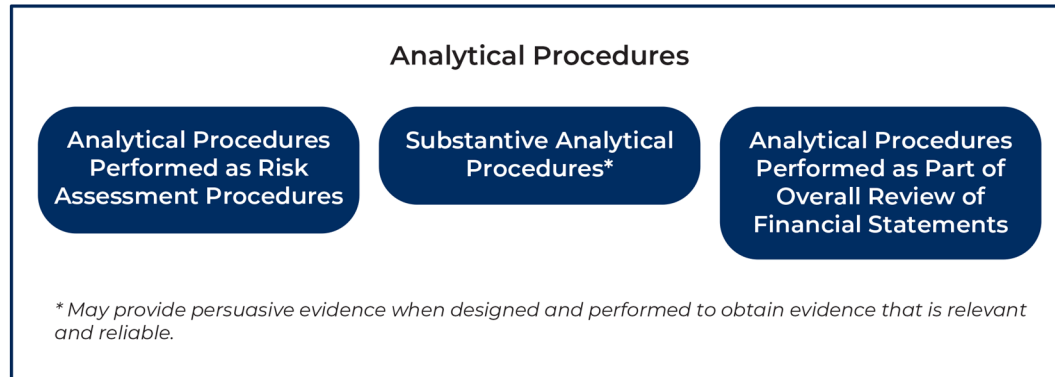
³⁰ See AS 2110.46-.48 for the auditor’s requirements related to designing and performing analytical procedures as part of identifying and assessing risks of material misstatement.

³¹ See paragraphs .05-.09 of AS 2810, *Evaluating Audit Results* for the auditor’s requirements related to performing analytical procedures in the overall review.

³² See AS 2305 for the auditor’s requirements related to substantive analytical procedures. The Board has a separate standard-setting project (<https://pcaobus.org/oversight/standards/standard-setting-research-projects/substantive-analytical-procedures>) related to substantive analytical procedures, which will likely result in changes to the auditor’s responsibilities regarding the use of substantive analytical procedures and, in turn, may result in changes to AS 2305.

³³ See AS 2110.48.

Figure 2. Analytical Procedures



Under PCAOB standards, analytical procedures involve comparing the auditor’s expectations, that have been derived from plausible and predictable relationships, to recorded amounts and investigating significant differences. For example, a substantive analytical procedure performed regarding a company’s interest expense could be performed at a more disaggregated level than a risk assessment procedure. It could involve the auditor developing an expectation about the amount of the expense based on information available to the auditor about the par value of the financial instruments and the applicable interest rates, comparing the expectation to the company’s recorded interest expense, and investigating significant differences between the company’s recorded amount and the auditor’s expectation.

Specifying the Difference Between Tests of Details and Analytical Procedures

To increase the likelihood that auditors obtain sufficient appropriate audit evidence when using technology-assisted analysis, the proposed amendments would more specifically outline differences between tests of details and analytical procedures under PCAOB standards. Unlike with respect to analytical procedures, existing PCAOB standards do not elaborate on the particular features of tests of details. Existing standards describe types of procedures that may serve as tests of details but also indicate that such procedures could be performed as risk assessment procedures or tests of controls.³⁴ The proposed amendments to paragraphs .13 and .21 of AS 1105 would further clarify the meaning of the term “test of details” by explaining that a test of details involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures generally do not involve evaluating individual items, unless those items are part of the auditor’s investigation of significant differences from expected amounts.

³⁴ See, e.g., AS 1105.13-.14.

As described above in Section II, our research indicates that technology-assisted analysis is used in designing and performing a variety of audit procedures, including risk assessment and substantive audit procedures, including substantive analytical procedures and tests of details. For example, a procedure that uses technology-assisted analysis to recalculate individual stock-based compensation awards by using grant date, stock price, and type of award could be considered a test of details under PCAOB standards because the recalculation is performed for each individual item in the account.

In contrast, an audit procedure that uses technology-assisted analysis to develop an auditor's expectation for interest income in total for the account, would be considered an analytical procedure, not a test of details, if the procedure was not applied to individual items in the account. In this scenario, if the auditor had identified a significant risk of material misstatement related to the account or disclosure and their relevant assertion(s), the auditor would be required to supplement the analytical procedures with tests of details of the account or disclosure.³⁵

Emphasizing the Importance of Appropriate Disaggregation or Detail of Information Used as Audit Evidence

Whether an auditor performs tests of details, substantive analytical procedures, or other tests, technology-assisted analysis may enable the auditor to analyze large volumes of information at various levels of disaggregation (e.g., regional or global) or detail (e.g., relevant characteristics of individual items such as product type or division). Our research indicates that determining the appropriate level of disaggregation or detail of information that the auditor is using as audit evidence is important for obtaining audit evidence that is relevant in supporting the auditor's conclusions.³⁶ The level of disaggregation or detail that is appropriate depends on the objective of the audit procedure. For example, when testing the valuation assertion of residential loans that are measured based on the fair value of the collateral, disaggregated sales data for residential properties by geographic location would likely provide more relevant audit evidence than combined sales data for both commercial and residential properties by geographic location.

The proposed amendments would amend existing paragraph .07 of AS 1105 to emphasize that the relevance of audit evidence depends on the level of disaggregation or detail of information necessary to achieve the objective of an audit procedure. The proposed amendments would not prescribe an expected level of disaggregation or detail, as auditor

³⁵ See AS 2301.11.

³⁶ See, e.g., page 5 of *Staff Guidance – Insights for Auditors Evaluating the Relevance and Reliability of Audit Evidence Obtained From External Sources* (October 2021), available at: <https://pcaobus.org/oversight/standards/staff-guidance>.

judgment is needed to determine the relevance of information based on the objective of the audit procedure.

Questions:

4. Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?
5. Would the proposed amendment that states that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure improve the auditor's evaluation of the relevance of audit evidence? If not, what changes should be made?

B. Specifying the Auditor's Responsibilities When Using Audit Evidence for More Than One Purpose

See paragraph .14 of AS 1105 of the proposed amendments in Appendix 1.

The proposed amendments would, consistent with other standards, specify auditor responsibilities when audit evidence obtained from an audit procedure is used for more than one purpose.

Multi-purpose Audit Procedures in PCAOB Standards

Under PCAOB standards, the purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.³⁷ Although AS 1105 – a standard that describes specific audit procedures – does not specify whether an audit procedure may be designed to achieve more than one purpose, the standard does not preclude the auditor from designing and performing multi-purpose audit procedures.³⁸ In fact, other PCAOB standards have long permitted auditors to use audit evidence for more than one purpose through the performance of properly designed “dual-purpose” procedures in certain scenarios.³⁹

³⁷ See, e.g., AS 1105.14.

³⁸ This interpretation was highlighted in a recent PCAOB staff publication. See page 4 of the Spotlight: *Data and Technology Research Project Update* (May 2020), available at <https://pcaobus.org/Documents/Data-Technology-Project-Spotlight.pdf>.

³⁹ See, e.g., AS 2110.39, which states that “The auditor may obtain an understanding of internal control concurrently with performing tests of controls if he or she obtains sufficient appropriate evidence to achieve the objectives of both procedures,” and AS 2301.47, which discusses performing a

Considering the variety of applications of technology-assisted analysis throughout the audit, the question of whether the audit evidence obtained from an audit procedure that involves technology-assisted analysis can be used for more than one purpose has arisen during our research. We believe PCAOB standards could be modified to address these matters more specifically, to facilitate the auditor's design and performance of audit procedures that provide sufficient appropriate audit evidence.

Specifying Auditor Responsibilities When Using Audit Evidence for More Than One Purpose

We are proposing to amend paragraph .14 of AS 1105 to supplement existing direction in AS 2110 and AS 2301. The revisions to AS 1105.14 would specify that if an auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure to achieve each of the relevant objectives. For example, if an auditor uses audit evidence from an audit procedure to inform their risk assessment and to perform a substantive audit procedure, the auditor would need to design the procedure to achieve the objectives of both AS 2110 and AS 2301. The proposed amendments would address situations identified in our research where auditors could potentially perform multi-purpose procedures involving technology-assisted analysis.

In particular, the staff's research indicates that technology-assisted analysis could be used in a variety of audit procedures, including risk assessment and further audit procedures (which include tests of details and substantive analytical procedures). The staff's research also indicates that an audit procedure that involves technology-assisted analysis may provide audit evidence for more than one purpose (e.g., identifying and assessing risks of material misstatement and addressing assessed risks). For example, a technology-assisted analysis of the accounts related to the procurement process could both: (i) provide the auditor with insights into the volume of payments made to new vendors (e.g., a risk assessment procedure to identify new or different risks); and (ii) concurrently match approved purchase orders to invoices received and payments made for each item within a population (e.g., a test of details to address an assessed known risk associated with the occurrence of expenses and obligations of liabilities).

The proposed amendments are designed to increase the likelihood that auditors appropriately design and perform multiple-purpose audit procedures that involve technology-assisted analysis to obtain sufficient and appropriate audit evidence. The proposed amendments are not meant to suggest that all audit procedures involving technology-assisted analysis possess some inherent characteristics of a multi-purpose audit procedure. As noted above, for an audit procedure to be considered multi-purpose, the procedure needs to be designed and performed to achieve the desired relevant objectives of each procedure. An

substantive test of a transaction concurrently with a test of a control relevant to that transaction (a "dual-purpose test").

auditor may use audit evidence from an audit procedure that involves technology-assisted analysis to achieve one or, if possible, several objectives, depending on the facts and circumstances of the company and the audit.

The purpose, objective, and results of multi-purpose procedures should be clearly documented. Under existing PCAOB standards, audit documentation must contain sufficient information to enable an experienced auditor, having no previous connection with the engagement, to understand the nature, timing, extent, and results of the procedures performed, evidence obtained, and conclusions reached.⁴⁰ Accordingly, audit documentation should make clear each purpose of the multi-purpose procedure, the results of the procedure, the evidence obtained, the conclusions reached, and how such evidence achieves the objectives of each procedure.

Questions:

6. Are the proposed requirements that specify the auditor's responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

C. Specifying Considerations for the Auditor's Investigation of Items When Designing or Performing Substantive Audit Procedures

See paragraph .37A of AS 2301 of the proposed amendments in Appendix 1.

The proposed amendments would specify an auditor's responsibilities regarding addressing specific items identified by the auditor when designing and performing substantive audit procedures.

Selecting Certain Items for Testing Under PCAOB Standards

Under PCAOB standards, the auditor may use one or a combination of means to select items for testing – selecting all items, selecting a representative sample, and selecting specific items. The auditor may decide to test specific items within a population because they are important to accomplishing the objective of the audit procedure or because they exhibit some other characteristic (e.g., they are unusual or risk-prone).⁴¹ Under PCAOB standards, applying audit procedures to specific items does not constitute audit sampling. Audit sampling involves selecting for testing items in such a way that the selected items (an audit sample) can be expected to be representative of the population, so the results of the test could be projected to

⁴⁰ See paragraphs .04 and .06 of AS 1215, *Audit Documentation*.

⁴¹ See, e.g., AS 1105.25.

the population.⁴² In contrast, items selected based on certain criteria would not necessarily be representative of the population.

Our research indicates that auditors use technology-assisted analysis to identify specific items within a population (e.g., an account or class of transactions) for further investigation. For example, auditors may identify all revenue transactions above a certain amount, transactions processed by certain individuals, or transactions where the shipping date does not match the date of the invoice. Because technology-assisted analysis may enable the auditor to examine all items in a population, it is possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor.

Considering current practice, we believe that PCAOB standards should be modified to address more directly the auditor's responsibilities in such scenarios. The auditor's appropriate investigation of identified items is important both for identifying and assessing the risks of material misstatement and for designing and implementing appropriate responses to the identified risks. For example, the auditor's investigation may indicate a previously unidentified risk of material misstatement, or a need to modify planned audit procedures to appropriately address an already identified risk.

Specifying Auditor Responsibilities for Investigating the Identified Items

The proposed amendments, which would be included as new paragraph AS 2301.37A, supplement existing direction in PCAOB standards. They would specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures on all or part of a population of items.

In practice, an auditor may establish criteria and identify and investigate specific items when performing risk assessment procedures and use the results to design a substantive procedure. Alternatively, an auditor may establish criteria and identify and investigate specific items as part of performing a substantive procedure in response to an assessed risk of material misstatement.

Under the proposed amendments, when the auditor establishes and uses criteria to identify items for further investigation, as part of designing or performing substantive procedures, the auditor's investigation should consider whether the identified items:

- Provide audit evidence that contradicts the evidence upon which the original risk assessment was based;
- Indicate a previously unidentified risk of material misstatement;

⁴² See, e.g., AS 1105.27 and AS 2315.24.

- Represent a misstatement or indicate a deficiency in the design or operating effectiveness of a control; or
- Otherwise indicate a need to modify the auditor's risk assessment or planned audit procedures.

When the auditor's investigation identifies a fact pattern described in the above considerations, the auditor would have a responsibility to address it as required under existing PCAOB standards, which may include inquiring of management. An auditor may also determine it necessary to perform an additional, more focused, analysis of the same population (e.g., to determine whether information obtained through the investigation indicates that a previously unidentified risk of material misstatement exists). As the auditor's investigation could be pivotal for identifying a risk of material misstatement or for determining the appropriate response to risk, the proposed amendments would require the auditor, when inquiring of management, to obtain audit evidence to evaluate the appropriateness of management's response. The auditor has a responsibility under existing PCAOB standards to document the investigation, including whether additional audit procedures should be performed following the consideration of the above factors and, if so, which ones.

Certain Considerations When Applying Proposed Amendments

The proposed amendments would not prescribe the nature, timing, or extent of procedures for investigating the identified items. Because of the wide variety of analyses that may be applied by the auditor, it would be impractical to anticipate what a particular investigation could entail or what information it may provide to the auditor. Further, the nature, timing, and extent of an investigation (including the number of items selected for further testing) would depend on whether it is conducted as part of the risk assessment when designing substantive procedures, or in response to the identified risks.

For example, as part of performing risk assessment procedures, an auditor may identify a significant number of revenue transactions involving new products that were released during the year under audit. The auditor may further investigate the identified items by analyzing the correlation between certain accounts to determine whether there are components of the revenue account that are subject to significantly differing risks of material misstatement (e.g., customer returns and refunds that are particularly prevalent for some products but not others). The auditor may use the results to design substantive procedures that would address the risks.

In another example, as part of performing substantive procedures for raw material purchase transactions, an auditor may identify items with certain characteristics (e.g., amount, timing, or location). Investigating the identified transactions could involve examining documentary support for all the identified items where the risk of material misstatement has been assessed as higher; and for the identified items where the risk of material misstatement has been assessed as lower, the auditor may select specific items for testing. The auditor could

assess risk relating to certain transactions differently based on auditor determined characteristics, such as amount, timing, location, or other characteristics, and select items for testing based on assessed risk.⁴³

The proposed amendments do not address the auditor's responsibilities over other items in the population (i.e., items other than those identified by the auditor for further investigation). The auditor would determine the nature, timing, and extent of audit procedures that are necessary to perform relating to the other items in the population in accordance with existing PCAOB standards.⁴⁴

Questions:

7. Would the proposed amendments, that specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?
8. What other factors, if any, should the auditor consider when investigating items that meet criteria established by the auditor when designing or performing substantive procedures?

D. Specifying Auditor Responsibilities for Evaluating the Reliability of Certain Audit Evidence

See paragraphs .08, .10, .10A, .15, .19 and .21 of AS 1105 of the proposed amendments in Appendix 1.

The proposed amendments would specify auditor responsibilities regarding certain company-provided information that the auditor uses as audit evidence. They would also highlight and emphasize the importance of controls over information technology.

Using Information Provided by the Company as Audit Evidence

Audit evidence is all information that is used by the auditor in arriving at the conclusions on which the auditor's opinion is based, including information in electronic form used in technology-assisted analysis.⁴⁵ The auditor may obtain audit evidence from the company or

⁴³ In practice, this is sometimes referred to as "transaction scoring," because an auditor would assign a risk "score" to a transaction based on its characteristics or other factors.

⁴⁴ See, e.g., AS 2301.36-.46 describing the auditor's responsibilities for substantive procedures, including determining the nature, timing, and extent of procedures.

⁴⁵ See AS 1105.02.

from external sources. Information that is extracted from a company's information system and provided to the auditor may include: (i) company-produced information (e.g., invoices issued by the company or shipping documents created by the company); and (ii) information that the company received from external sources (e.g., purchase orders submitted by customers or cash received by the company from a customer as payment for an invoice).

Under PCAOB standards, the reliability of information produced by the company is increased when the company's controls over that information are effective.⁴⁶ PCAOB standards discuss the auditor's responsibility for evaluating whether the information produced by the company is sufficient and appropriate for purposes of the audit.⁴⁷ PCAOB standards do not include analogous requirements regarding information received by the company from external sources, maintained in its information systems, and then provided to the auditor to be used as audit evidence.

The staff's research indicates that in performing technology-assisted analysis, auditors use large volumes of information provided by the company that the company received from external sources in electronic form. Because the information is maintained in the company's information system and can potentially be modified by the company, we believe it important to address in PCAOB standards the reliability of audit evidence that the auditor obtains through using this type of information.

Evaluating the Reliability of External Information Maintained by the Company in Electronic Form and Used as Audit Evidence

We propose specifying auditor responsibilities regarding the reliability of external information maintained by the company in electronic form and used as audit evidence, in a new paragraph AS 1105.10A. The paragraph would explain that a company may provide to the auditor information that it received from one or more external sources and maintained in its information systems in electronic form. Because the company exercises certain control over the information, the proposed amendments would require the auditor to evaluate whether the information is reliable for purposes of the audit by performing procedures to:

- Obtain an understanding of the source of the information and the company's procedures by which such information is received, recorded, maintained, and processed in the company's information systems; and

⁴⁶ See AS 1105.08, which uses the term "generated internally by the company." As noted below in this section, the proposed amendments would amend AS 1105.08 by replacing this term with "produced by the company" to use consistent terminology throughout the standard.

⁴⁷ See AS 1105.10.

- Test controls (including information technology general controls (ITGC) and automated application controls) over the company’s procedures described above, or test the company’s procedures described above (e.g., comparing the information the company provided to the auditor to information the company obtained from the external source).

Performing the evaluation procedures described above over the information in electronic form is important to the auditor’s conclusion about the reliability of audit evidence obtained from audit procedures that use such information. Under PCAOB standards, evidence obtained from a knowledgeable source that is independent of the company is more reliable than evidence obtained only from internal company sources.⁴⁸ The proposed amendments are designed to address the risk that the external information maintained by the company and provided to the auditor to be used as audit evidence may be incomplete or inaccurate (i.e., when compared with the original version that the company obtained) or that a company may otherwise modify the external information before providing it to the auditor.

Emphasizing the Importance of Controls Over Information Technology

As noted above, auditors obtain from companies and use in the performance of audit procedures large volumes of information in electronic form. Accordingly, the proposed amendments would emphasize the importance of controls over information technology for the reliability of audit evidence.⁴⁹ In paragraph AS 1105.08, we propose to state that both information produced by the company and external information maintained by the company in electronic form are more reliable when the company’s controls over that information are effective, including ITGCs and automated application controls. A similar point would be included in paragraph AS 1105.15 regarding company-produced information. In addition, we propose to emphasize in paragraph AS 1105.10 that testing controls over the accuracy and completeness of company-produced information includes testing ITGCs and automated application controls. The added emphasis would not imply that testing other relevant controls is less important or unnecessary.

Certain Considerations When Applying the Proposed Amendments

The proposed amendments would not prescribe the nature, timing, or extent of the auditor’s evaluation procedures. An auditor would design the evaluation procedures considering the wide variety of types of external information received by companies and differences in the procedures for receiving, recording, maintaining, and processing such information. Further, the nature, timing, and extent of the auditor’s evaluation would depend

⁴⁸ See AS 1105.08.

⁴⁹ The proposed amendments to AS 1105.08, .10, and .15, which are discussed in this section, state “where applicable” in relation to the controls over information technology, as information produced by the company may also include information not in electronic form which is subject to manual controls.

on the purpose for which the auditor uses the information whose reliability is being evaluated. In general, performing audit procedures to address the risks of material misstatement involves obtaining more persuasive evidence than in performing risk assessment procedures. Accordingly, evaluating the reliability of information used in substantive procedures and tests of controls would require more auditor effort than evaluating the reliability of information used in risk assessment procedures.

Questions:

9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?
10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?
11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

Updating Certain Terminology in AS 1105

In conjunction with the discussion of information technology in this release, we are proposing to update certain terminology in AS 1105, without changing the meaning of the requirements. Considering the greater availability and use of information in electronic form, we are proposing to use the term “information” instead of the term “documents and records” in AS 1105.15 and .19. Further, to avoid a misinterpretation that only certain procedures could be performed electronically, we are proposing to remove the reference to performing recalculation “manually or electronically” in AS 1105.19. For consistent terminology, we are proposing to replace the terms “generated internally by the company” in AS 1105.08 and “internal” in AS 1105.15 with the term “produced by the company.” In addition, we are proposing to clarify in AS 1105.21 that auditors may analyze both external and company-produced data as part of performing analytical procedures.

Question:

12. Are the proposed amendments that update certain terminology in AS 1105 clear and appropriate? If not, what changes should be made?

IV. ECONOMIC ANALYSIS

The Board is mindful of the economic impacts of its standard setting. This section describes the economic baseline, economic need, expected economic impacts of the proposed amendments, and alternative approaches considered. There are limited data and research findings available to estimate quantitatively the economic impacts of the proposed amendments. Therefore, the Board's economic discussion is largely qualitative in nature. However, where reasonable and feasible, the analysis incorporates quantitative information, including descriptive statistics on the tools that firms use in technology-assisted analysis.⁵⁰

A. Baseline

Section II above describes important components of the baseline against which the economic impact of the proposed amendments can be considered, including the Board's existing standards, firms' current practices, and observations from the Board's inspections program. We discuss below two additional aspects of current practice that inform our understanding of the economic baseline: (i) the staff's analysis of the tools that auditors use in technology-assisted analysis; and (ii) research on auditors' use of technology-assisted analysis.

1. Staff Analysis of Tools that Auditors Use in Technology-Assisted Analysis

Staff reviewed information provided by firms pursuant to the PCAOB's oversight activities regarding tools they use in technology-assisted analysis.⁵¹ The information identifies and describes tools used by audit engagement teams. Staff reviewed information provided by

⁵⁰ As noted above, this proposal uses the term "technology-assisted analysis" in reference to the analysis of information in electronic form that is performed with the assistance of technology-based tools. Others, including firms and academics, may refer to such analysis as "data analysis" or "data analytics." As discussed above, the use of "data analysis" or "data analytics" in Section IV of the release is intended to align with terminology used by the source cited. The terms "data analysis" or "data analytics" should not be confused with the term "analytical procedures" that is used in PCAOB standards to refer to a specific type of audit procedure (see AS 1105.21) that may be performed with or without the use of information in electronic form or technology-based data analysis tools.

⁵¹ Within this proposal the term "tool" refers to specialized software that is used on audit engagements to examine, sort, filter, and analyze transactions and information used as audit evidence or which otherwise generates information that aids auditor judgment in the performance of audit procedures. Spreadsheet software itself is not inherently a tool, but a spreadsheet may be built to perform the functions of a tool (examining, sorting, filtering, etc.), in which case it is included within the scope of this term. The staff's analysis was limited to tools classified by the firms as data analytic tools. Tools may be either purchased by a firm or developed by a firm.

the U.S. global network firms (“GNFs”) as well as two U.S. non-affiliated firms (“NAFs”).⁵² The information was first provided for the 2018 inspection year and is available through the 2021 inspection year for the GNFs and is available through the 2020 inspection year for the NAFs reviewed, as of the date of our analysis.

Firms reported using both internally developed and externally purchased tools. Some of the externally purchased tools were customized by the firms. The nature and number of tools varied across firms, and their use varied with the facts and circumstances of specific audit engagements. Some firms consolidated some of their tools over time, thus reducing the number of unique tools they use. Firms generally do not require the use of such tools on audit engagements.

The average number of tools used by audit engagement teams, as reported to the PCAOB by the U.S. GNFs, increased from approximately 13 to approximately 16 per firm, or approximately 24%, between 2018 and 2021. In the 2021 inspection year, U.S. GNFs reported that 90% of their tools are used for data visualization, summarization, tabulation, or modeling.⁵³ All the U.S. GNFs reported using tools to assist in: (i) identifying and selecting journal entries; and (ii) selecting samples for testing. The U.S. GNFs reported having tools that support both risk assessment (e.g., assessing loan risk) and substantive procedures (e.g., performing journal entry testing or fair value testing). The U.S. GNFs developed 73% of the reported tools in-house while the rest were purchased externally. Furthermore, approximately 14% of the U.S. GNFs’ tools used cloud computing. Less than 7% of the U.S. GNFs’ tools used blockchain technology, artificial intelligence, or robotic process automation. All the U.S. GNFs’ tools use issuer data and 18% also use third-party data.

Compared to U.S. GNFs, the U.S. NAFs within the scope of the staff’s review reported to the PCAOB using fewer tools. In all inspection years between 2018 and 2020, on average, the NAFs reported using approximately one tool per firm. The U.S. NAFs used the tools to visualize, summarize, and model data. One U.S. NAF developed an in-house tool to support risk assessment and testing of companies’ credit loss models. Another U.S. NAF purchased a tool externally to support audit sampling procedures. Furthermore, the U.S. NAFs’ tools used issuer data (e.g., journal entry data) as inputs.

2. Research on Auditors’ Use of Technology-Assisted Analysis

Academic studies regarding the prevalence of technology-based tools used to analyze information in electronic form and the impacts of using such tools on issuer audits and broker-

⁵² The U.S. GNFs are Deloitte & Touche LLP, Ernst & Young LLP, KPMG LLP, PricewaterhouseCoopers LLP, Grant Thornton LLP, and BDO US LLP. U.S. NAF firms include registered firms that are not global network firms.

⁵³ For example, some firms identified Microsoft Power BI and IDEA as tools used for data visualization, summarization, tabulation, or modelling.

dealer engagements are limited. However, several recent surveys provide insights regarding: (i) how auditors have been incorporating data analytics into their audit approaches; and (ii) potential impediments to auditors' further implementation of data analytics.

Regarding incorporating data analytics into audit approaches, the surveys indicate that while the use of data analytics presently may not be widespread, it is becoming more common in various aspects of the audit, primarily risk assessment and, to a lesser extent, substantive procedures. For example, a 2017 survey of U.S. auditors reported that auditors used data analytics in risk assessment and journal entry testing.⁵⁴ Also, a survey of Norwegian auditors, some of whom perform audits under PCAOB standards, reported that the use of data analytics was not yet widespread and was used primarily as supplementary evidence. In this survey, the respondents indicated that data analytics were used primarily in risk assessment and various types of substantive procedures, including analytical procedures.⁵⁵ A 2018 to 2019 survey of auditors in New Zealand Big 4 firms reported that auditors are more frequently encountering accessible, large client data sets. The respondents reported that third-party tools to process the data are increasingly available and allow auditors with less expertise in data analytics to make effective use of data.⁵⁶

Earlier surveys reported qualitatively similar, though less prevalent, use of data analytics. For example, a 2016 survey of Canadian firms reported that 63% and 39% of respondents from large firms and small to mid-sized firms, respectively, had used data analytics, most commonly in the risk assessment and substantive procedures phases. Both groups reported that data analytics was used to provide corroborative evidence for assertions about classes of transactions for the period under audit. However, only smaller and mid-size firms reported that data analytics also was used to provide primary evidence for assertions about classes of transactions for the period under audit and account balances at period end.

⁵⁴ See Ashley A. Austin, Tina D. Carpenter, Margaret H. Christ, and Christy S. Nielson, *The Data Analytics Journey: Interactions Among Auditors, Managers, Regulation, and Technology*, 38 *Contemporary Accounting Research* 1888 (2021). The survey also states:

[A]uditors report that they strategically leverage data analytics to provide clients with business-related insights. However, regulators voice concerns that this practice might impair auditor independence and reduce audit quality.

The proposed amendments are not intended to suggest that when using technology-assisted analysis in an audit, auditors do not need to comply with PCAOB independence standards and rules, and the independence rules of Securities and Exchange Commission. Auditors are still expected to comply with these standards and rules when using technology-assisted analysis on an audit engagement.

⁵⁵ See Aasmund Eilifsen, Finn Kinserdal, William F. Messier, and Thomas E. McKee, *An Exploratory Study into the Use of Audit Data Analytics on Audit Engagements*, 34 *Accounting Horizons* 75 (2020). The authors do not report when the survey was performed.

⁵⁶ See Angela Liew, Peter Boxall, and Denny Setiawan, *The Transformation to Data Analytics in Big-Four Financial Audit: What, Why and How?*, 34 *Pacific Accounting Review* 569 (2022).

Furthermore, only larger firms reported that data analytics was also used to provide corroborative evidence for assertions about account balances at period end.⁵⁷

A survey of 2015 year-end audits performed by UK firms reported that the use of data analytics was not as prevalent as the market might expect, with the most common application being journal entry testing.⁵⁸ A 2015 survey of UK and EU auditors found that data analytics was being used in both risk assessment procedures and to perform certain audit procedures (e.g., recalculation).⁵⁹ Finally, a 2014 survey of U.S. auditors reported that they often use information technology to perform risk assessment, analytical procedures, sampling, internal control evaluations, and internal control documentation. The respondents identified moderate use of data analytics in the context of client administrative or practice management.⁶⁰

Regarding potential impediments to the implementation of data analytics, surveys indicate that some firms are reluctant to implement data analytics in their audit approach due to perceived regulatory risks. For example, one survey found that auditors were cautious about implementing data analytics due to a lack of explicit regulation. Respondents reported performing both tests of details that do not involve data analytics and those that do involve data analytics on audits under PCAOB standards.⁶¹ Another survey found that auditors did not require the use of advanced data analytic tools partly due to uncertainty regarding how regulatory authorities would perceive the quality of the audit evidence produced. However, the respondents tended to agree that both standard setters and the auditing standards themselves allow information obtained from data analytics as audit evidence.⁶² Another survey found that some auditors were reluctant to implement data analytics because the auditing standards do

⁵⁷ See CPA Canada, *Audit Data Analytics Alert* (2017) at 7, Exhibit 4, and Exhibit 7.

⁵⁸ See Financial Reporting Council, *Audit Quality Thematic Review: The Use of Data Analytics in the Audit of Financial Statements* (2017) at 11.

⁵⁹ See George Salijeni, Anna Samsonova-Taddei, and Stuart Turley, *Big Data and Changes in Audit Technology: Contemplating a Research Agenda*, 49 *Accounting and Business Research* 95 (2019).

⁶⁰ See D. Jordan Lowe, James L. Bierstaker, Diane J. Janvrin, and J. Gregory Jenkins, *Information Technology in an Audit Context: Have the Big 4 Lost Their Advantage?*, 32 *Journal of Information Systems* 87 (2018). The authors do not define the term “data analytics,” and present it as an application of information technology in the audit distinct from other audit planning and audit testing applications. However, we believe it is likely that some of the applications of information technology reported in the study would likely be impacted by the proposed amendments and hence provide relevant baseline information.

⁶¹ See Austin et al., *The Data Analytics Journey* 1910. See also Liew et al., *The Transformation* 579-580.

⁶² See Eilifsen et al., *An Exploratory Study*. See also Felix Krieger, Paul Drews, and Patrick Velte, *Explaining the (Non-) Adoption of Advanced Data Analytics in Auditing: A Process Theory* 41 *International Journal of Accounting Information Systems* 1 (2021).

not specifically address them.⁶³ These survey findings are consistent with other surveys that find auditors structure their audit approaches to manage regulatory risks arising from inspections, including risks associated with compliance with PCAOB standards.⁶⁴ However, by contrast, another survey found that the audit regulatory environment was not commonly cited by respondents as an impediment to the use of data analytics.⁶⁵

Overall, the research suggests that the auditor's use of data analytics in designing and performing audit procedures is becoming increasingly prevalent. This provides a baseline for considering the potential impacts of the proposed amendments. The research also suggests that some auditors perceive regulatory risks when implementing data analytics. This provides evidence of a potential problem that standard setting may address.

Question:

13. We request comment generally on the baseline for evaluating the economic impacts of the proposed amendments. Is there additional information regarding auditors' use of technology-assisted analysis or are there additional academic studies that we should consider?

B. Need

Several attributes of the audit market support a need for the PCAOB to establish effective audit performance standards. First, the company under audit, investors, and other financial statement users cannot easily observe the services performed by the auditor or the quality of the audit. This leads to a risk that, unbeknownst to the company under audit, investors, or other financial statement users, the auditor may perform a low-quality audit.⁶⁶

⁶³ See, Salijeni, et al., *Big Data*.

⁶⁴ See Kimberly D. Westermann, Jeffrey Cohen, and Greg Trompeter, *PCAOB Inspections: Public Accounting Firms on "Trial,"* 36 *Contemporary Accounting Research* 694 (2019). See also Lindsay M. Johnson, Marsha B. Keune, and Jennifer Winchel, *U.S. Auditors' Perceptions of the PCAOB Inspection Process: A Behavioral Examination,* 36 *Contemporary Accounting Research* 1540 (2019).

⁶⁵ See CPA Canada, *Audit Data Analytics* at Exhibit 10.

⁶⁶ See, e.g., Monika Causholli and Robert W. Knechel, *An Examination of the Credence Attributes of an Audit,* 26 *Accounting Horizons* 631, 632 (2012):

During the audit process, the auditor is responsible for making decisions concerning risk assessment, total effort, labor allocation, and the timing and extent of audit procedures that will be implemented to reduce the residual risk of material misstatements. As a non-expert, the auditee may not be able to judge the appropriateness of such decisions. Moreover, the auditee may not be able to ascertain the extent to which the risk of material misstatement has been reduced even after the audit is completed. Thus,

Second, the federal securities laws require that an issuer retain an auditor for the purpose of preparing or issuing an audit report. While the appointment, compensation, and oversight of the work of the registered public accounting firm conducting the audit is, per Sarbanes-Oxley, entrusted to the issuer's audit committee,⁶⁷ there is nonetheless a risk that the auditor may seek to satisfy the interests of the issuer audit client rather than the interests of investors and other financial statement users.⁶⁸ This risk can arise out of the audit committee's identification with the company or its management (e.g., for compensation) or through management's exercise of influence over the audit committee's supervision of the auditor, which can result in a *de facto* principal-agent relationship between the company and the auditor.⁶⁹ Effective auditing standards address these risks by explicitly assigning responsibilities to the auditor that, if executed properly, are expected to result in high-quality audits that satisfy the interests of audited companies, investors, and other financial statement users.

Economic theory suggests that technology is integral to the auditor's production function—i.e., the quantities of capital and labor needed to produce a given level of audit quality. As technology evolves, so do the quantities of capital and labor needed to produce a given level of audit quality.⁷⁰ Auditing standards that do not appropriately accommodate the evolution of technology may therefore inadvertently deter or insufficiently facilitate improvements to the audit approach. Risk-averse auditors may be especially cautious about incorporating significant new technological developments into their audit approaches because they may be either unfamiliar with the technology or unsure whether a new audit approach would comply with the PCAOB's auditing standards. On the other hand, auditing standards that are too accommodative (e.g., they do not fully address scenarios that may occur when auditors

information asymmetry exists between the auditee and the auditor, the benefit of which accrues to the auditor. If such is the case, the auditor may have incentives to: Under-audit, or expend less audit effort than is required to reduce the uncertainty about misstatements in the auditee's financial statements to the level that is appropriate for the auditee.

⁶⁷ See Section 301 of Sarbanes-Oxley, 15 U.S.C § 78f(m) (also requiring that the firm "report directly to the audit committee"). As an additional safeguard, the auditor is also required to be independent of the audit client. See 17 CFR 210.2-01.

⁶⁸ See, e.g., Joshua Ronen, *Corporate Audits and How to Fix Them*, 24 *Journal of Economic Perspectives* 189 (2010).

⁶⁹ See *id.*; see also, e.g., Liesbeth Bruynseels and Eddy Cardinaels, *The Audit Committee: Management Watchdog or Personal Friend of the CEO?*, 89 *The Accounting Review* 113 (2014). Cory Cassell, Linda Myers, Roy Schmardebeck, and Jian Zhou, *The Monitoring Effectiveness of Co-Opted Audit Committees*, 35 *Contemporary Accounting Research* 1732 (2018). Nathan Berglund, Michelle Draeger, and Mikhail Sterin, *Management's Undue Influence over Audit Committee Members: Evidence from Auditor Reporting and Opinion Shopping*, 41 *Auditing: A Journal of Practice & Theory* 49 (2022).

⁷⁰ See Gregory N. Mankiw, *Principles of Economics*, (6th ed. 2008) at 76 (discussing how technology shifts the supply curve).

use new technologies in the audit) may not sufficiently address potential risks to audit quality arising from new audit approaches.

Since 2010, when the PCAOB released a suite of auditing standards related to the auditor's assessment of and response to risk, two key technological developments have occurred. First, ERP systems that structure and house large volumes of information in electronic form have become more prevalent among issuers. For example, one study reports that the global ERP market size increased by 60% between 2006 and 2012.⁷¹ As a result, auditors have greater access to large volumes of company-produced and third-party information in electronic form that may potentially serve as audit evidence. Second, the use of more sophisticated data analysis tools has become more prevalent among auditors.⁷² As noted above, the staff's analysis of the tools that firms use in technology-assisted analysis indicates that the number of such tools used by U.S. GNFs on audits increased by 24% between 2018 and 2021.⁷³

These recent technological developments have been changing the way technology-assisted analysis is used in audits, as discussed in more detail in Section IV.A above. Although PCAOB standards related to the auditor's assessment of and response to risk generally were designed to apply to audits that use information technology, they may be less effective in providing direction to auditors if the standards do not address certain advancements in the use of technology-assisted analysis in audits. Modifying existing PCAOB standards through the proposed amendments would address this risk, as discussed below. The remainder of this section discusses the specific problem that the proposed amendments are intended to address and how the proposed amendments are intended to address it.

1. Problem to be Addressed

Audit procedures that involve technology-assisted analysis may be an effective and efficient way to obtain persuasive audit evidence. Although the staff's research indicates that auditors are using technology-assisted analysis to obtain audit evidence, it also indicates that

⁷¹ See Adelin Trusculescu, Anca Draghici, and Claudiu Tiberiu Albuлесcu, *Key Metrics and Key Drivers in the Valuation of Public Enterprise Resource Planning Companies*, 64 *Procedia Computer Science* 917 (2015).

⁷² This may be caused in part by a decrease in the quality-adjusted cost of software (i.e., the cost of software holding quality fixed). For example, see U.S. Bureau of Economic Analysis, "Table 5.6.4. Price Indexes for Private Fixed Investment in Intellectual Property Products by Type," (accessed Dec. 21, 2022) (indicating that the price index for capital formation in software by the business sector has decreased by approximately 13% between 2010 and 2021). In preparing its price indices, the U.S. Bureau of Economic Analysis attempts to control for changes in product quality over time. Improvements to product quality may have contributed in part to some increase in the cost of software, including some of the software that can process large volumes of data.

⁷³ See Section IV.A. See also Lowe et al., *Information Technology* 95 (reporting an increase in the use of information technology in audits between 2004 and 2014).

existing PCAOB standards do not specify aspects of designing and performing audit procedures that involve technology-assisted analysis. As discussed in detail in Section III above, these aspects may include classifying auditing procedures, determining whether an audit procedure provides audit evidence for more than one purpose, investigating certain items identified by the auditor, and evaluating the reliability of external information obtained by the company and provided to the auditor in electronic form.

Consequently, under existing standards, there is a risk that when using technology-based tools to design and perform audit procedures that involve technology-assisted analysis, auditors may fail to obtain sufficient appropriate audit evidence when addressing one or more financial statement assertions. For example, if an auditor does not appropriately investigate certain items identified through technology-assisted analysis, the auditor may not identify indicators of a risk of material misstatement that would need to be addressed under PCAOB standards. In another example, if an auditor does not appropriately evaluate the level of disaggregation of certain information maintained by the company, the auditor would not be able to determine, under PCAOB standards, whether the evidence obtained is relevant to the assertion being tested.⁷⁴

Furthermore, there is a risk that auditors may choose not to perform audit procedures that involve technology-assisted analysis, even if performing such procedures would be a more effective or efficient way of obtaining audit evidence. For example, an auditor may choose not to perform a substantive procedure that involves technology-assisted analysis if the auditor cannot determine whether the procedure would be considered a test of details under existing standards.

2. How the Proposed Amendments Would Address the Need

The proposed amendments would address the risk that the auditor may not obtain sufficient appropriate audit evidence when addressing one or more financial statement assertions. For example, the proposed amendments would: (i) specify considerations for the auditor when specific items are identified for investigation as part of designing or performing substantive procedures;⁷⁵ (ii) specify procedures the auditor should perform to evaluate the reliability of external information maintained by the company in electronic form and used as audit evidence;⁷⁶ and (iii) clarify that if the auditor uses audit evidence from an audit procedure

⁷⁴ See, e.g., Helen Brown-Liburd, Hussein Issa, and Danielle Lombardi, *Behavioral Implications of Big Data's Impact on Audit Judgment and Decision Making and Future Research Directions*, 29 *Accounting Horizons* 451 (2015) (discussing how irrelevant information may limit the value of data analysis). See also Financial Reporting Council, *Audit Quality*.

⁷⁵ See detailed discussion in Section III.C.

⁷⁶ See detailed discussion in Section III.D.

for more than one purpose, the auditor should design and perform the procedure to achieve the relevant objectives.⁷⁷

The proposed amendments would also address the risk that auditors may choose not to perform audit procedures involving technology-assisted analysis by clarifying: (i) the difference between tests of details and analytical procedures;⁷⁸ and (ii) that audit evidence from an audit procedure may be used for more than one purpose.⁷⁹ Collectively, the proposed amendments should lead auditors to perceive less risk of non-compliance with PCAOB standards when using technology-assisted analysis.

Question:

14. The Board requests comment generally on the need for rulemaking. Should we consider any additional arguments, academic studies, or data related to the need for rulemaking?

C. Economic Impacts

This section discusses the expected benefits and costs of the proposed amendments and potential unintended consequences. Overall, we expect that the economic impact of the proposed amendments, including both benefits and costs, would be relatively modest. We also expect that the benefits of the proposed amendments would justify the costs and any unintended consequences.

1. Benefits

The proposed amendments may lead auditors to design and perform audit procedures more efficiently and effectively. They would achieve this by clarifying and strengthening requirements of AS 1105 and AS 2301 related to aspects of designing and performing audit procedures that involve technology-assisted analysis.

More efficient and effective audit procedures may lead to higher audit quality, more efficient audits, lower audit fees, or some combination of the three. To the extent the proposed amendments would lead to higher audit quality, they would benefit investors and other financial statement users by reducing the likelihood that the financial statements are materially misstated, whether due to error or fraud.

Investors may also benefit from being able to use the more reliable financial information to improve the efficiency of their capital allocation decisions (e.g., investors may reallocate

⁷⁷ See detailed discussion in Section III.B.

⁷⁸ See detailed discussion in Section III.A.

⁷⁹ See detailed discussion in Section III.B.

capital from less profitable companies to more profitable companies). Investors may also perceive less risk in capital markets generally, leading to an increase in the supply of capital. An increase in the supply of capital could increase capital formation while also reducing the cost of capital to companies.⁸⁰

Auditors also are expected to benefit from the proposed amendments because the additional clarity provided by the proposed amendments could reduce regulatory uncertainty and the associated compliance costs. Specifically, the proposal would provide auditors with a better understanding of their responsibilities, which in turn should reduce the risk that auditors would design and perform potentially unnecessary audit procedures (e.g., potentially duplicative audit procedures).

The following discussion describes the benefits of key aspects of the proposed amendments that are expected to impact auditor behavior. As discussed in Section IV.B above, the changes are intended to clarify and specify aspects of designing and performing audit procedures that involve technology-assisted analysis. To the extent that a firm has already incorporated aspects of the proposed amendments into its methodology, some of the benefits described below would be reduced.⁸¹

i. Reducing the Likelihood of Not Obtaining Sufficient Appropriate Audit Evidence

The proposed amendments would enhance audit quality by reducing the likelihood that an auditor who uses technology-assisted analysis will issue an opinion without obtaining sufficient appropriate audit evidence to support the opinion. For example, the proposed amendments would specify auditors' responsibilities for investigating items that meet auditor-established criteria when designing or performing substantive procedures. In another example, the proposed amendments would specify auditors' responsibilities for evaluating the reliability of electronic information. As a result, auditors may be more likely to obtain sufficient appropriate audit evidence when designing and performing audit procedures that use technology-assisted analysis. This would result in higher audit quality. As described above, the higher audit quality would benefit investors and other financial statement users by reducing the likelihood that the financial statements are materially misstated, whether due to error or fraud. These benefits to audit quality would apply both to audit engagements where auditors currently incorporate technology-assisted analysis into their audit approach and audit

⁸⁰ See, e.g., Hanwen Chen, Jeff Zeyun Chen, Gerald J. Lobo, and Yanyan Wang, *Effects of Audit Quality on Earnings Management and Cost of Equity Capital: Evidence from China*, 28 *Contemporary Accounting Research* 892 (2011); Richard Lambert, Christian Leuz, and Robert E. Verrecchia, *Accounting Information, Disclosure, and the Cost of Capital*, 45 *Journal of Accounting Research* 385 (2007).

⁸¹ See discussion in Section II.C.

engagements where auditors have been previously reluctant to use technology-assisted analysis because of the risk of noncompliance.

ii. Greater Use of Technology-Assisted Analysis

The proposed amendments may lead to some increase in the use of technology-assisted analysis by auditors when designing and performing multi-purpose audit procedures and tests of details. For example, the proposed amendments would clarify the difference between tests of details and analytical procedures. As a result of this clarification, auditors may make greater use of technology-assisted analysis when designing or performing tests of details because they may perceive a reduction in noncompliance risk.

Notwithstanding the associated fixed and variable costs, greater use of technology-assisted analysis by the auditor when designing or performing audit procedures may allow the auditor to perform engagements with fewer resources, which may increase the overall resources available to perform audits.⁸² In economic terms, it may increase the supply of audit quality.⁸³ As one example, the auditor may be able to gather sufficient appropriate audit evidence with fewer staff hours by using technology-assisted analysis to automatically perform an audit procedure rather than manually perform the procedure. Current labor shortages of qualified individuals and decreases in accounting graduates and new CPA examination candidates amplify the value of gathering sufficient appropriate audit evidence with fewer staff hours.⁸⁴ Apart from consideration of demands from the audited company, discussed in greater detail below, the efficiencies that may arise from greater utilization of technology-assisted analysis would be retained by the auditor in the form of higher profit. However, to better address regulatory, litigation, or reputational risks, the auditor may choose to redeploy engagement-level resources to other work. For example, auditors may shift staff resources to audit areas or issues that are more complex or require more professional judgment.⁸⁵

As a result of the greater use of technology-assisted analysis by auditors, some companies may be able to obtain a higher level of audit quality, renegotiate their audit fee, or

⁸² See Section IV.C.2.ii for discussion on the costs associated with greater use of technology-assisted analysis.

⁸³ For purposes of this discussion, “audit quality” refers to assurance on the financial statements provided by the auditor to the users of the financial statements. The “supply of audit quality” is the relationship between audit quality and incremental cost to the auditor. An “increase in the supply of audit quality” occurs when the incremental costs of audit quality decrease (e.g., due to technological advances) and the auditor is able to profitably provide more audit quality.

⁸⁴ See, e.g., AICPA Private Companies Practice Section, *2022 PCPS CPA Top Issues Survey (2022)*; AICPA, *2021 Trends: A report on accounting education, the CPA exam and public accounting firms’ hiring of recent graduates (2021)*.

⁸⁵ See, e.g., Salijeni et al., *Big Data*.

some combination of the two. The outcome would likely vary by company depending on the competitiveness of the company's local audit market and the company's audit quality expectations. For example, negotiating power may be smaller for larger multinational issuers, which may have fewer auditor choices, than for smaller issuers, which may have more auditor choices. Furthermore, some companies may expect their auditor to reassign engagement team staff resources from repetitive or less complex audit procedures to more judgmental aspects of the audit. Other companies may expect the engagement team to perform the audit with fewer firm resources (e.g., fewer billable hours). Some research suggests that most companies prefer audit fee reductions in response to their auditor's greater use of data analytics.⁸⁶

Because the proposed amendments do not require the auditor to use technology-assisted analysis when designing and performing audit procedures, the associated benefits would likely be limited to cases where the benefits to the auditor would justify the costs to the auditor, as well as any fixed costs required to update the auditor's approach (e.g., update methodologies, provide training). The fixed costs may be significant; however, some firms may have incurred some of these costs already.⁸⁷ Moreover, despite the continued tendency of companies to adopt ERP systems to house their accounting and financial reporting data, some issuers' data may remain prohibitively difficult to obtain and analyze, thus limiting the extent to which the auditor can use technology-assisted analysis.⁸⁸ Some survey research also suggests that some firms lack sufficient staff resources to appropriately deploy data analysis.⁸⁹ Collectively, these private costs may deter some auditors from incorporating technology-assisted analysis into their audit approach and thereby reduce the potential benefits associated with greater use of the technology-assisted analysis.

Question:

15. Are there additional potential benefits that should be considered?

2. Costs

We expect the costs associated with the proposed amendments to be relatively modest. To the extent that firms would make changes to their existing audit approaches as a result of the proposed amendments, they may incur certain fixed costs (i.e., costs that are generally independent of the number of audits performed), including costs to: update audit

⁸⁶ See Austin et al., *The Data Analytics Journey*.

⁸⁷ See Section IV.A., discussing increased availability of data analytic tools at larger firms and Austin et al., *The Data Analytics Journey* 1908.

⁸⁸ See, e.g., Austin, *The Data Analytics Journey* 1906.

⁸⁹ See, e.g., Saligeni, *Big Data* 108. See also CPA Canada, *Audit Data Analytics*. However, some more recent survey research suggests that auditors tend to agree that they have the technical expertise to deploy data analytics. See Eilifsen et al., *An Exploratory Study* 84.

methodologies, templates, and tools; prepare training materials; train their staff; and purchase software. GNFs and some NAFs are likely to update their methodologies using internal resources, whereas other NAFs are likely to purchase updated methodologies from external vendors.

In addition, firms may incur certain engagement-level variable costs. For example, the proposed amendments related to evaluating whether external information maintained by the company in electronic form and used as audit evidence is reliable could require additional time and effort by engagement teams that would use such information in performing audit procedures. This additional time, and therefore the resulting variable costs, may be less on integrated audits or financial-statement audits that take a controls reliance approach because, in these cases, ITGCs and automated application controls over information in electronic form may already be tested. As another example, some firms may incur software license fees that vary by the number of users. To the extent that auditors incur higher costs to implement the proposed amendments and can pass on at least part of the increased costs through an increase in audit fees, audited companies may also incur an indirect cost.

Some aspects of the proposed amendments may result in more or different costs than others. The following discussion describes the potential costs associated with specific aspects of the proposed amendments.

i. Reducing the Likelihood of Not Obtaining Sufficient Appropriate Audit Evidence

As discussed above, the proposed amendments are intended to enhance audit quality by reducing the likelihood that an auditor would not obtain sufficient appropriate audit evidence. The proposed amendments would achieve this primarily by further clarifying and specifying auditor responsibilities when designing and performing audit procedures that involve technology-assisted analysis. As a result, some auditors may perform incremental procedures to comply with the new requirements, which may lead to incremental costs. For example, in addition to applying technology-assisted analysis to each item in the population and other tests of details to select individual items, some auditors may perform tests of details on a sample of items from the same population. These incremental procedures may apply to audit engagements where auditors currently incorporate technology-assisted analysis into their audit approach, and audit engagements where auditors have been reluctant to use technology-assisted analysis due to the risk of noncompliance.

At the firm level, some firms may incur relatively modest fixed costs to update their methodologies and templates (e.g., documentation templates) or customize their technology-based tools. Firms may also need to prepare training materials and train their staff. Firms may incur relatively modest variable costs if they determine that additional time and effort on an individual audit engagement would be necessary in order to design and perform audit procedures to comply with PCAOB standards as clarified or specified by the proposed

amendments. For example, a firm may incur additional variable costs to investigate items identified by the auditor that meet auditor-established criteria when designing or performing substantive procedures.

ii. Greater Use of Technology-Assisted Analysis

As discussed above, the proposed amendments would not require the use of technology-assisted analysis in an audit. However as noted above, the proposed amendments may lead to some increase in the use of technology-assisted analysis by auditors when designing and performing multi-purpose audit procedures and tests of details. The greater use of technology-assisted analysis by the auditor may allow the auditor to perform engagements with fewer resources. However, this potential efficiency benefit would likely be offset, in part, by fixed and variable costs to the audit firm. Relatively modest, fixed costs would be incurred to incorporate technology-assisted analysis into its audit approach. For example, some firms may purchase, develop, or customize new tools.⁹⁰ Some firms may choose to hire programmers to develop tools internally. Firms may also incur fixed costs to obtain an understanding of companies' information systems.⁹¹

Relatively modest variable costs would be incurred to use technology-assisted analysis on individual audit engagements. For example, firms may incur variable costs associated with preparing company data for analysis or updating their technology-based tools. In another example, a firm may incur variable costs to obtain specialized expertise for using technology-assisted analysis on audit engagements. For example, a firm data analytics specialist may be used on an audit engagement to automate certain aspects of data preparation or design and perform a custom technology-assisted analysis.

As discussed in Section IV.C.1.ii above, greater use of technology-assisted analysis may result in lower audit fees under certain conditions. We account for this impact as a reduced benefit to audit firms rather than a cost.

Several factors may limit the costs associated with greater use of technology-assisted analysis in an audit. First, the costs would likely only be incurred by a firm if it determined that the private benefits to it would exceed the private costs. Second, some firms have already made investments to incorporate technology-assisted analysis on audits. Finally, the cost of software that can process and analyze large volumes of data has been decreasing.⁹²

⁹⁰ See Financial Reporting Council, *Audit Quality*. See also Austin et al., *The Data Analytics Journey*.

⁹¹ See Eilifsen et al., *An Exploratory Study 71* (discussing how audit data analytics are less often used when the issuer does not have an integrated ERP/IT system). See also Financial Reporting Council, *Audit Quality*.

⁹² See *supra* note 72.

Questions:

16. Are there additional potential costs that should be considered? If so, what are they?
17. Are there additional academic studies or data related to the potential benefits and costs of the proposed amendments? If so, please provide citations or other reference information for such studies and data.

3. Potential Unintended Consequences

In addition to the benefits and costs discussed above, the proposed amendments could have unintended economic impacts. The following discussion describes potential unintended consequences considered by the Board and, where applicable, factors that mitigate them. These include actions taken by the Board as well as the existence of other countervailing forces.

i. Reduction in the Use of Technology-Assisted Analysis

It is possible that, as a result of the proposed amendments, some auditors could reduce their use of technology-assisted analysis. This could occur if the proposed amendments would lead firms to conclude that the private benefits would not justify the private costs of involving technology-assisted analysis in their audit approach. For example, the proposed amendments would specify considerations for investigating certain items identified by the auditor and procedures for evaluating the reliability of certain electronic information. As discussed in Section IV.C.2 above, such additional responsibilities could lead to fixed costs at the firm level and variable costs at the engagement level. As a result, some auditors may choose not to use audit procedures that involve technology-assisted analysis.

Several factors would likely limit any negative effects associated with this potential unintended consequence. First, we believe that any decrease in the use of technology-assisted analysis would likely arise from a reduction in the performance of audit procedures that would not have contributed significantly to providing sufficient appropriate audit evidence. This development would therefore probably benefit, rather than detract from, audit quality. For example, currently some auditors might not appropriately investigate items identified when using technology-assisted analysis in designing and performing substantive procedures. The proposed amendments would specify auditors' responsibilities for investigating the items identified. If auditors view the proposed requirement as too costly to implement, they may instead choose to perform audit procedures that do not involve the use of technology-assisted analysis. If the other procedures chosen by the auditor provide sufficient appropriate audit evidence, the reduction in the performance of audit procedures that involve technology-assisted analysis where auditors did not appropriately investigate items identified would benefit audit quality.

Second, any reduction in the use of technology-assisted analysis as a result of certain proposed amendments, such as in the above scenario, may be offset by the greater use of

technology-assisted analysis in other scenarios. For example, as discussed in Section IV.C.1 above, the proposed amendments would clarify the difference between tests of details and analytical procedures. As a result, auditors may make greater use of technology-assisted analysis in performing tests of details because they may perceive a reduction in non-compliance risk.

Finally, because the proposed amendments would be principles-based, auditors would be able to tailor their work subject to the proposed amendments to the facts and circumstances of the audit. For example, the proposed amendments would not prescribe procedures for investigating items that meet certain criteria established by the auditor. Rather, the auditor would be able to structure the investigation based on, among other things, the type of analysis (e.g., performed as part of risk assessment or substantive procedure) and considerations provided by the proposed amendments (e.g., indicate a previously unidentified risk of material misstatement).⁹³

ii. Inappropriately Designed Multiple-Purpose Audit Procedures

It is possible that some auditors could view the proposed amendments as allowing any audit procedure that involves technology-assisted analysis to be considered a multi-purpose procedure. Auditors who hold this view may fail to design and perform audit procedures that provide sufficient appropriate audit evidence. This potential unintended consequence would be mitigated by: (i) existing requirements of PCAOB standards; and (ii) a proposed amendment to paragraph .14 of AS 1105.

Existing PCAOB standards address auditors' responsibilities for designing and performing procedures to identify, assess, and respond to risks of material misstatement and obtaining sufficient appropriate audit evidence.⁹⁴ Auditor responsibilities established by existing PCAOB standards apply to the performance of both audit procedures that are designed to achieve a single objective and audit procedures that are designed to achieve multiple objectives. Further, existing standards specify auditor responsibilities in certain scenarios that involve multi-purpose audit procedures. For example, existing PCAOB standards discuss that an audit procedure may serve as both a risk assessment and a test of control provided that the auditor meets the objectives of both procedures.⁹⁵ In another example, existing PCAOB standards discuss that audit procedures may serve as both a test of control and a substantive procedure provided that the auditor meets the objectives of both procedures.⁹⁶

⁹³ See discussion in Section III.C.

⁹⁴ See AS 2110 and AS 2301.

⁹⁵ See AS 2110.39.

⁹⁶ See AS 2301.47.

In addition, the proposed amendment to paragraph .14 of AS 1105 would further mitigate the risk that auditors fail to design and perform multi-purpose audit procedures. The proposed amendment would emphasize the auditor's responsibility to achieve particular objectives specified in existing PCAOB standards when using audit evidence from an audit procedure for multiple purposes.

iii. Disproportionate Impact on Smaller Firms

It is possible that the costs of the proposed amendments could disproportionately impact smaller firms. As discussed in Section IV.C.2 above, increased use of technology-assisted analysis may require incremental investment and specialized skills. Smaller firms have fewer audit engagements over which to distribute fixed costs (i.e., they lack economies of scale). As a result, smaller firms may be less likely than larger firms to increase their use of technology-assisted analysis when designing and performing multi-purpose audit procedures and tests of details. Although the proposed amendments would not require auditors to use technology-assisted analysis, a choice not to use it may negatively impact smaller firms' ability to compete with larger firms (e.g., if using technology-assisted analysis is expected by prospective users of the auditor's report).

This potential unintended negative consequence would be mitigated by several factors. First, the fixed costs associated with the proposed amendments may be offset by engagement-level efficiencies which may increase the competitiveness of smaller firms. Second, as discussed in Section IV.B above, the costs associated with acquiring and incorporating technology-based tools that are used to perform technology-assisted analysis into firms' audit approaches have been decreasing and may continue to decrease. Third, while reduced competition may result in higher audit fees,⁹⁷ it may also reduce issuers' opportunity to opinion shop, thereby positively impacting audit quality.⁹⁸ Finally, any negative impact to the smaller firms' ability to compete with larger firms would likely be limited to smaller and mid-size issuers because smaller firms may lack the economies of scale and multi-national presence to compete for the audits of larger issuers. Indeed, there is some evidence that smaller and larger audit firms do not directly compete with one another in some segments of the audit market.⁹⁹

⁹⁷ See, e.g., Joshua L. Gunn, Brett S. Kawada, and Paul N. Michas, *Audit Market Concentration, Audit Fees, and Audit Quality: A Cross-Country Analysis of Complex Audit Clients*, 38 *Journal of Accounting and Public Policy* 1 (2019).

⁹⁸ See, e.g., Nathan J. Newton, Julie S. Persellin, Dechun Wang, and Michael S. Wilkins, *Internal Control Opinion Shopping and Audit Market Competition*, 91 *The Accounting Review* 603 (2016); Nathan J. Newton, Dechun Wang, and Michael S. Wilkins, *Does a Lack of Choice Lead to Lower Quality?: Evidence from Auditor Competition and Client Restatements*, 32 *Auditing: A Journal of Practice & Theory* 31 (2013).

⁹⁹ See, e.g., GAO Report No. GAO-03-864, *Public Accounting Firms: Mandated Study on Consolidation and Competition* (July 2003).

Questions:

18. The Board requests comment generally on the potential unintended consequences of the proposal. Are the responses to the potential unintended consequences discussed in the release adequate? Are there additional potential unintended consequences that the Board should consider? If so, what responses should be considered?
19. Are there any other economic impacts we did not describe above that are relevant to the Board's consideration?

D. Alternatives Considered

The development of the proposed amendments involved considering numerous alternative approaches to addressing the problems described above. This section explains: (i) why standard setting is preferable to other policy-making approaches, such as providing interpretive guidance or enhancing inspection or enforcement efforts; (ii) other standard-setting approaches that were considered; and (iii) key policy choices made by the Board in determining the details of the proposed amendments.

1. Why Standard Setting is Preferable to Other Policy-Making Approaches

The Board's policy tools include alternatives to standard setting, such as issuing interpretive guidance or increasing the focus on inspections or enforcement of existing standards. The Board considered whether providing guidance or enhancing inspection or enforcement efforts would be effective mechanisms to address concerns associated with aspects of designing and performing audit procedures that involve technology-assisted analysis.

Interpretive guidance provides additional information about existing standards. Inspection and enforcement actions take place after insufficient audit performance (and potential investor harm) has occurred. Devoting additional resources to guidance, inspections, or enforcement activities, without improving the relevant performance requirements for auditors, would at best focus auditors' performance on existing standards and would not provide the benefits associated with improving the standards.

The proposed amendments, by contrast, are designed to improve PCAOB standards by adding further clarity and specificity to existing requirements. For example, the proposed amendments would clarify the differences between two types of audit procedures discussed in PCAOB standards – tests of details and analytical procedures. In another example, the proposed amendments would specify auditor responsibilities for investigating certain items and for evaluating the reliability of certain information used as audit evidence.

2. Other Standard-Setting Approaches Considered

The Board considered, but is not proposing, developing a standalone standard that would address designing and performing audit procedures that involve technology-assisted analysis. Addressing the use of technology-assisted analysis in a standalone standard could further highlight the auditor's responsibilities relating to using technology-assisted analysis. However, a new standalone standard would also unnecessarily duplicate many of the existing requirements, as existing PCAOB standards are already designed to be applicable to audits performed with the use of technology, including technology-assisted analysis.

Further, as Section II above explains in greater detail, the staff's research indicates that auditors are using technology-assisted analysis in audit procedures. Rather than proposing a new standalone standard, this proposal uses a more targeted approach that includes amending certain requirements of the existing standards where our research indicates the need for providing further clarity and specificity regarding designing and performing audit procedures that involve technology-assisted analysis.

3. Key Policy Choices

i. Investigating Certain Items Identified by the Auditor

As discussed in Sections II and III above, auditors may use technology-assisted analysis to identify specific items within a population (e.g., transactions in an account) for further investigation.¹⁰⁰ The auditor's investigation may include, for example, examining documentary evidence for items identified through the analysis or performing procedures to determine whether the identified items indicate a previously unidentified risk of material misstatement.

We considered but are not proposing prescribing specific audit procedures to investigate items identified by the auditor in the way described in the above examples. We also considered but are not proposing prescribing specific audit procedures to address items not identified by the auditor for investigation (e.g., items in the remaining population). While certain audit procedures may be effective when investigating items identified under certain circumstances, other audit procedures may be more effective under different circumstances. Because of the wide range of both analyses that may be applied by the auditor and potentially appropriate audit procedures for investigating these items, we believe that an overly prescriptive standard could, in certain cases, unintentionally lead auditors to perform audit procedures without considering the facts and circumstances of the audit engagement.

¹⁰⁰ See detailed discussion in Section III.C.

ii. Defining the Term “Data Analysis”

As technology-assisted analysis is often referred to in practice as “data analysis” or “data analytics,” we considered but are not proposing to define the term “data analysis” or “data analytics” as a new type of specific audit procedure that would be included in the list of specific audit procedures in AS 1105. Defining a new type of specific audit procedure could potentially provide additional clarity when describing auditor responsibilities under PCAOB standards. However, our research indicates that, in practice, the meaning of the term “data analysis” varies depending on the context in which it is used. Auditors may use technology-assisted analysis at various stages of the audit (e.g., when identifying risk or addressing risk) and in various types of audit procedures (e.g., inspection, recalculation, reperformance, analytical procedures). As technology evolves, the meaning of the term data analysis may also evolve. Defining the term “data analysis” as a new specific audit procedure under AS 1105 could therefore create confusion and unnecessarily constrain the potential use of technology-assisted analysis in the audit.

Questions:

20. Are any of the alternative approaches, or any other approaches, preferable to the approaches that are being proposed to address audit procedures that involve technology-assisted analysis? If so, what are they and what reasons support one or more alternative approaches over the proposed approaches?
21. Are there additional economic considerations associated with this proposal that should be considered? If so, what are those considerations?

V. SPECIAL CONSIDERATIONS FOR AUDITS OF EMERGING GROWTH COMPANIES

Pursuant to Section 104 of the Jumpstart Our Business Startups (“JOBS”) Act, rules adopted by the Board subsequent to April 5, 2012 generally do not apply to the audits of emerging growth companies (“EGCs”), as defined in Section 3(a)(80) of the Securities Exchange Act of 1934 (“Exchange Act”), unless the SEC “determines that the application of such additional requirements is necessary or appropriate in the public interest, after considering the protection of investors, and whether the action will promote efficiency, competition, and capital formation.”¹⁰¹ As a result of the JOBS Act, the rules and related amendments to PCAOB

¹⁰¹ See Pub. L. No. 112-106 (Apr. 5, 2012). See Section 103(a)(3)(C) of the Sarbanes-Oxley Act, as added by Section 104 of the JOBS Act, which also provides that any rules of the Board requiring: (1) mandatory audit firm rotation; or (2) a supplement to the auditor’s report in which the auditor would be required to provide additional information about the audit and the financial statements of the issuer (auditor discussion and analysis), shall not apply to an audit of an EGC. The proposed amendments do not fall within either of these two categories.

standards that the Board adopts are generally subject to a separate determination by the SEC regarding their applicability to audits of EGCs.

To inform consideration of the application of auditing standards to audits of EGCs, the PCAOB staff prepares a white paper annually that provides general information about characteristics of EGCs.¹⁰² As of the November 15, 2021, measurement date, PCAOB staff identified 3,092 companies that self-identified with the SEC as EGCs and filed with the SEC audited financial statements in the 18 months preceding the measurement date.

As discussed in Section II, auditors are expanding the use of technology-assisted analysis in audits. The proposed amendments would address aspects of designing and performing audit procedures that involve technology-assisted analysis. The proposed amendments are principles-based and are intended to be applied in all audits performed pursuant to PCAOB standards, including audits of EGCs.

The discussion of benefits, costs, and unintended consequences of the proposed amendments in Section IV is generally applicable to all audits performed pursuant to PCAOB standards, including audits of EGCs. The economic impacts of the proposed amendments on an individual EGC audit would depend on factors such as the auditor's ability to distribute implementation costs across its audit engagements, whether the auditor has already incorporated technology-assisted analysis into its audit approach, and electronic information acquisition challenges (e.g., information availability, legal restrictions, or privacy concerns). EGCs are more likely to be newer companies, which are typically smaller in size and receive lower analyst coverage. These factors may increase the importance to investors of the higher audit quality resulting from the proposed amendments, as high-quality audits generally enhance the credibility of management disclosures.¹⁰³

¹⁰² For the most recent EGC white paper, see *Characteristics of Emerging Growth Companies and Their Audit Firms at November 15, 2021* (January 5, 2023), available at: <https://pcaobus.org/resources/other-research-projects>.

¹⁰³ Researchers have developed a number of proxies that are thought to be correlated with information asymmetry, including small issuer size, lower analyst coverage, larger insider holdings, and higher research and development costs. To the extent that EGCs exhibit one or more of these properties, there may be a greater degree of information asymmetry for EGCs than for the broader population of companies, which increases the importance to investors of the external audit to enhance the credibility of management disclosures. See, e.g., Steven A. Dennis and Ian G. Sharpe, *Firm Size Dependence in the Determinants of Bank Term Loan Maturity*, 32 *Journal of Business Finance and Accounting* 31 (2005); Michael J. Brennan and Avandhar Subrahmanyam, *Investment Analysis and Price Formation in Securities Markets*, 38 *Journal of Financial Economics* 361 (1995); David Aboody and Baruch Lev, *Information Asymmetry, R&D, and Insider Gains*, 55 *Journal of Finance* 2747 (2000); Raymond Chiang and P. C. Venkatesh, *Insider Holdings and Perceptions of Information Asymmetry: A*

However, as discussed in Section IV.A above, the use of technology-assisted analysis appears to be less prevalent among NAFs than GNFs. Therefore, since EGCs are more likely to be audited by NAFs than are non-EGCs, the impacts of the proposed amendments on EGC audits may be less than on non-EGC audits.¹⁰⁴

The proposed amendments could impact competition in an EGC's product market if the indirect costs to audited companies disproportionately impact EGCs relative to their competitors. However, as discussed in Section IV.C above, the costs associated with the proposed amendments are expected to be relatively modest. Therefore, the impact of the proposed amendments on competition, if any, is likewise expected to be limited.

Overall, the proposed amendments are expected to enhance the efficiency and quality of EGC audits that implement technology-assisted analysis and contribute to an increase in the credibility of financial reporting by those EGCs. To the extent the proposed amendments would improve EGCs' financial reporting quality, they may also improve the efficiency of capital allocation, lower the cost of capital, and enhance capital formation. For example, investors may improve their capital allocation by reallocating capital from less profitable EGCs to more profitable EGCs. Investors may also perceive less risk in EGC capital markets generally, leading to an increase in the supply of capital to EGCs. This may increase capital formation and reduce the cost of capital to EGCs. Furthermore, if certain of the proposed amendments did not apply to the audits of EGCs, auditors would need to address additional differing audit requirements in their methodologies, or policies and procedures, with respect to audits of EGCs and non-EGCs. This could create the potential for additional confusion.

Accordingly, and for the reasons explained above, the Board anticipates that, if it adopts the proposed amendments, it will request the Commission to determine that it is necessary or appropriate in the public interest, after considering the protection of investors and whether the action will promote efficiency, competition, and capital formation, to apply the proposed amendments to audits of EGCs.

Note, 43 *Journal of Finance* 1041 (1988); Molly Mercer, *How Do Investors Assess the Credibility of Management Disclosures?*, 18 *Accounting Horizons* 185 (2004).

¹⁰⁴ This statement is based on staff analysis of SEC filings and data from Audit Analytics and Standard & Poor's as of the Nov. 15, 2021 measurement date. The non-EGC-population is limited to exchange-listed companies that are not registered investment companies or EGCs and have filed audited financial statements with the SEC, including an audit report signed by a firm in the 18 months preceding the measurement date.

Question:

22. The Board requests comment generally on the analysis of the impacts of the proposal on EGCs. Are there reasons why the proposal should not apply to audits of EGCs? If so, what changes should be made so that the proposal would be appropriate for audits of EGCs? What impact would the proposal likely have on EGCs, and how would this affect efficiency, competition, and capital formation?

VI. EFFECTIVE DATE

The Board seeks comment on the amount of time auditors would need before the proposed amendments would become effective, if adopted by the Board and approved by the SEC. Specifically, the Board is considering whether compliance with the adopted amendments should be required for audits of fiscal years ending on or after June 30 in the year after approval by the SEC.

Questions:

23. How much time following SEC approval would audit firms need to implement the proposed requirements?
24. Would requiring compliance for fiscal years beginning after the year of SEC approval present challenges for auditors? If so, what are those challenges, and how should they be addressed?

VII. APPENDICES

This proposal includes this release with its appendices:

- Appendix 1 – Proposed Amendments
- Appendix 2 – Conforming Amendments to Related PCAOB Auditing Standards

VIII. OPPORTUNITY FOR PUBLIC COMMENT

The Board seeks comments on all aspects of its proposal, as well as specific comments on the proposed amendments. Among other things, the Board seeks comment on the economic analysis relating to its proposal, including potential costs. To assist the Board in evaluating such matters, the Board requests relevant information and empirical data regarding the proposed amendments.

Written comments should be sent by email to comments@pcaobus.org or through the Board's website at www.pcaobus.org. Comments may also be sent to the Office of the Secretary, PCAOB, 1666 K Street, NW, Washington, DC 20006-2803. All comments should refer

to PCAOB Rulemaking Docket Matter No. 052 in the subject or reference line and should be received by the Board no later than August 28, 2023.

The Board will consider all comments received. After the close of the comment period, the Board will determine whether to adopt final rules, with or without changes from the proposal. Any final rules adopted will be submitted to the SEC for approval. Pursuant to Section 107 of the Sarbanes-Oxley Act, proposed rules of the Board do not take effect unless approved by the SEC. Standards are rules of the Board under the Sarbanes-Oxley Act.

* * *

On the 26th day of June, in the year 2023, the foregoing was, in accordance with the bylaws of the Public Company Accounting Oversight Board,

ADOPTED BY THE BOARD.

/s/ Phoebe W. Brown

Phoebe W. Brown
Secretary

June 26, 2023

* * *

APPENDIX 1: PROPOSED AMENDMENTS

Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures That Involve Technology-Assisted Analysis of Information in Electronic Form

This appendix presents the proposed amendments to the following PCAOB standards. Language that would be deleted is ~~struck through~~. Language that would be added is underlined.

- AS 1105, *Audit Evidence*
- AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*

AS 1105, *Audit Evidence*

Relevance and Reliability

.07 *Relevance*. The relevance of audit evidence refers to its relationship to the assertion or to the objective of the control being tested. The relevance of audit evidence depends on:

- a. The design of the audit procedure used to test the assertion or control, in particular whether it is designed to (1) test the assertion or control directly and (2) test for understatement or overstatement; ~~and~~
- b. The timing of the audit procedure used to test the assertion or control; and
- c. The level of disaggregation or detail of information necessary to achieve the objective of the audit procedure.

.08 *Reliability*. The reliability of evidence depends on the nature and source of the evidence and the circumstances under which it is obtained. ~~For example, in~~ In general:

- Evidence obtained from a knowledgeable source that is independent of the company is more reliable than evidence obtained only from internal company sources.

Note: See Appendix A of this standard for requirements related to the evaluation of evidence from a company's specialist.

- ~~The reliability of information generated internally~~ information produced by the company and external information maintained by the company in electronic form are more reliable ~~is increased~~ when the company's controls over that information including, where applicable, its information technology general controls and automated application controls, are effective.
- Evidence obtained directly by the auditor is more reliable than evidence obtained indirectly.
- Evidence provided by original documents is more reliable than evidence provided by photocopies or facsimiles, or documents that have been filmed, digitized, or otherwise converted into electronic form, the reliability of which depends on the controls over the conversion and maintenance of those documents.

Note: If a third party provides evidence to an auditor subject to restrictions, limitations, or disclaimers, the auditor should evaluate the effect of the restrictions, limitations, or disclaimers on the reliability of that evidence.

Using Information Produced by the Company

.10 When using information produced by the company as audit evidence, the auditor should evaluate whether the information is sufficient and appropriate for purposes of the audit by performing procedures to:³

- Test the accuracy and completeness of the information, or test the controls over the accuracy and completeness of that information, including, where applicable, information technology general controls and automated application controls;^{3A} and
- Evaluate whether the information is sufficiently precise and detailed for purposes of the audit.

³ When using the work of a company's specialist, see Appendix A of this standard. When using information produced by a service organization or a service auditor's report as audit evidence, see AS 2601, *Consideration of an Entity's Use of a Service Organization*, and for integrated audits, see AS 2201, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*.

^{3A} For situations involving information in electronic form, see paragraph .17 of AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*.

Evaluating the Reliability of External Information Maintained by the Company in Electronic Form

.10A The company may provide to the auditor information that the company received from one or more external sources and maintained in its information systems in electronic form.^{3B}

When using such information as audit evidence, the auditor should evaluate whether the information is reliable for purposes of the audit by performing procedures to:

- a. Obtain an understanding of the source of the information and the company's procedures by which such information is received, recorded, maintained, and processed in the company's information systems, and
- b. Test controls (including information technology general controls and automated application controls) over the company's procedures discussed in subpart (a) of this paragraph or test the company's procedures discussed in subpart (a) of this paragraph.

^{3B} For example, information regarding a purchase order submitted to the company by a customer or regarding cash received by the company from a customer as payment for an invoice.

Audit Procedures for Obtaining Audit Evidence

.13 Audit procedures can be classified into the following categories:

- a. Risk assessment procedures,⁶ and
- b. Further audit procedures,⁷ which consist of:
 - (1) Tests of controls, and
 - (2) Substantive procedures, including tests of details and substantive analytical procedures.

Note: A test of details involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts.^{7A}

⁶ AS 2110.

⁷ AS 2301, ~~The Auditor's Responses to the Risks of Material Misstatement.~~

^{7A} See also paragraph .21 of this standard.

.14 Paragraphs .15-.21 of this standard describe specific audit procedures. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure. If the auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure to achieve each of the relevant objectives. ^{7B}

^{7B} AS 2110 establishes requirements regarding the process of identifying and assessing risks of material misstatements of the financial statements. AS 2301 establishes requirements regarding designing and implementing appropriate responses to the risks of material misstatement, including tests of controls and substantive procedures.

Inspection

.15 Inspection involves examining information records or documents, whether internal or external, in paper form, electronic form, or other media, or physically examining an asset. Inspection of information records and documents provides audit evidence of varying degrees of reliability, depending on ~~its~~ their nature and source. ^{7C} ~~and, in the case of~~ information produced by the company, or external information maintained by the company, also depends on the effectiveness of the controls over their that information production, including, where applicable, information technology general controls and automated application controls. ^{7D} An example of inspection used as a test of controls is inspection of records for evidence of authorization.

^{7C} See paragraph .08 of this standard.

^{7D} For situations involving information in electronic form, see AS 2301.17.

Recalculation

.19 Recalculation consists of checking the mathematical accuracy of information documents or records. ~~Recalculation may be performed manually or electronically.~~

Analytical Procedures

.21 Analytical procedures consist of evaluations of financial information made by an analysis~~a study~~ of plausible relationships among both financial and nonfinancial data that can be external or company-produced. Analytical procedures also encompass the investigation of significant differences from expected amounts. Unlike tests of details, analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts.¹¹

¹¹ Paragraphs .46-.48 of AS 2110, establish requirements regarding performing analytical procedures as risk assessment procedures. AS 2305, *Substantive Analytical Procedures*, establishes requirements regarding ~~on~~-performing analytical procedures as substantive procedures. Paragraphs .05-.09 of AS 2810, *Evaluating Audit Results*, establish requirements regarding performing analytical procedures in the overall review of financial statements.

AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*

Substantive Procedures

.37A When the auditor establishes and uses criteria to identify items for further investigation,^{17A} as part of designing or performing substantive procedures, the auditor's investigation should consider whether the identified items:

- a. Provide audit evidence that contradicts the evidence on which the original risk assessment was based;
- b. Indicate a previously unidentified risk of material misstatement;
- c. Represent a misstatement or indicate a deficiency in the design or operating effectiveness of a control; or
- d. Otherwise indicate a need to modify the auditor's risk assessment or planned audit procedures.

Note: Inquiring of management may assist the auditor with this consideration. The auditor should obtain audit evidence to evaluate the appropriateness of management's responses.

^{17A} For example, an auditor may identify balances or transactions that contain a certain characteristic or that are valued outside of a range.

APPENDIX 2: CONFORMING AMENDMENTS TO RELATED PCAOB STANDARDS

In connection with the proposed amendments, the Board is proposing amendments to several auditing standards to conform to the requirements of the proposed amendments. Language that would be deleted by the proposed amendments is ~~struck through~~. Language that would be added by the proposed amendments is underlined. The presentation of proposed amendments to PCAOB standards by showing deletions and additions to existing sentences, paragraphs, and footnotes is intended to assist the reader in easily comprehending the Board's proposed changes to the auditing standards. The Board's proposed amendments consist of only the deleted or added language. This presentation does not constitute or represent a proposal of all or of any other part of the auditing standard or interpretation as amended by this proposal.

The Board is requesting comments on all aspects of the proposed amendments.

Other PCAOB Standards Proposed to Be Amended

PCAOB Standard	Paragraph(s)	Subject Heading of Paragraph Affected	Action(s)	Page(s)
AS 1105, <i>Audit Evidence</i>	.A8	Appendix A – Using the Work of a Company's Specialist as Audit Evidence.	Make conforming amendment to footnote 5	p.A2-2
AS 2110, <i>Identifying and Assessing Risks of Material Misstatement</i>	.48	Performing Analytical Procedures	Make conforming amendment to footnote 27	p.A2-2
AS 2305, <i>Substantive Analytical Procedures</i>	.02	N/A	Make conforming amendment	p.A2-3
AS 2501, <i>Auditing Accounting Estimates, Including Fair Value Measurements</i>	.12	Testing Data Used	Make conforming amendment	p.A2-3
AS 2501	.13	Testing Data Used	Make conforming amendment	p.A2-3

AS 1105, Audit Evidence

Appendix A – Using the Work of a Company’s Specialist as Audit Evidence

.A8 The auditor should:

- a. Test the accuracy and completeness of company-produced data used by the specialist,⁴ and evaluate the relevance and reliability⁵ of data from sources external to the company that are used by the specialist;

⁴ See paragraph .10 of this standard.

⁵ See paragraphs .07, ~~and .08,~~ and .10A of this standard.

AS 2110, Identifying and Assessing Risks of Material Misstatement

Performing Analytical Procedures

.48 When performing an analytical procedure, the auditor should use his or her understanding of the company to develop expectations about plausible relationships among the data to be used in the procedure.²⁷ When comparison of those expectations with relationships derived from recorded amounts yields unusual or unexpected results, the auditor should take into account those results in identifying the risks of material misstatement.

²⁷Analytical procedures consist of evaluations of financial information made by an analysis-a study of plausible relationships among both financial and nonfinancial data that can be external or company-produced, see AS 1105.21.

AS 2305, *Substantive Analytical Procedures*

.02 Analytical procedures are an important part of the audit process and consist of evaluations of financial information made by an analysis—a study of plausible relationships among both financial and nonfinancial data that can be external or company-produced. Analytical procedures range from simple comparisons to the use of complex models involving many relationships and elements of data. A basic premise underlying the application of analytical procedures is that plausible relationships among data may reasonably be expected to exist and continue in the absence of known conditions to the contrary. Particular conditions that can cause variations in these relationships include, for example, specific unusual transactions or events, accounting changes, business changes, random fluctuations, or misstatements.

AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements*

Testing Data Used

.12 AS 1105 requires the auditor, when using information produced by the company as audit evidence, to evaluate whether the information is sufficient and appropriate for purposes of the audit by performing procedures to (1) test the accuracy and completeness of the information or test the controls over the accuracy and completeness of that information, including, where applicable, information technology general controls and automated application controls, and (2) evaluate whether the information is sufficiently precise and detailed for purposes of the audit.¹³

¹³ See AS 1105.10.

.13 If the company uses data from an external source, the auditor should evaluate the relevance and reliability of the data in accordance with AS 1105.¹⁴

¹⁴ See AS 1105.07-.08 and .10A. Appendix B of AS 1105 describes the auditor's responsibilities for obtaining sufficient appropriate audit evidence in situations in which the valuation of an investment is based on the investee's financial results.



Exhibit 2(a)(B)

Alphabetical List of Commenters on Proposed Rules in PCAOB Release No. 2023-004
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1	American Accounting Association, Auditing Standards Committee, Auditing Section
2	BDO USA, P.A.
3	Center for Audit Quality
4	Crowe LLP
5	Deloitte & Touche LLP
6	Ernst & Young LLP
7	Daniel Friscia
8	Grant Thornton LLP
9	Johnson Global Accountancy
10	KPMG LLP
11	Norman D. Marks, CPA, CRMA
12	Mazars USA LLP
13	Members of the Investor Advisory Group
14	MNP LLP
15	National Association of State Boards of Accountancy
16	Pennsylvania Institute of Certified Public Accountants
17	John Prendergast
18	PricewaterhouseCoopers LLP
19	Mark Reger
20	RSM US LLP
21	Texas Society of Certified Public Accountants

Comments of the Auditing Standards Committee of the Auditing Section of the American Accounting Association on the PCAOB's *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*

Participating Committee Members

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University of Wisconsin – Milwaukee
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Dana R. Hermanson (Outgoing Committee Chair)
Kennesaw State University
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School of Accountancy
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Jonathan S. Pyzoha (Incoming Committee Chair)
Miami University
Farmer School of Business
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Yibo (James) Zhang (Ad Hoc Member)
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Running Head: Comments on Technology-Assisted Analysis

Note: The views expressed in this letter are those of the participating members of the Committee and do not reflect an official position of the American Accounting Association. The comments do not necessarily reflect the views of every member.

Keywords: Auditing standards; PCAOB; technology-assisted analysis; data analytics

Comments of the Auditing Standards Committee of the Auditing Section of the American Accounting Association on the PCAOB's *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*

SUMMARY: On June 26, 2023, the Public Company Accounting Oversight Board (the Board or PCAOB) issued a request for comment on its *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (PCAOB 2023b). This commentary summarizes the participating committee members' views on the proposal. We first provide answers to specific questions posed in the Release, viewing the issuance of a new standard as a given. Subsequently, we also examine how well the proposal's economic analysis establishes a solid foundation for new standard setting.

Comments of the Auditing Standards Committee of the Auditing Section of the American Accounting Association on the PCAOB’s *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*

I. INTRODUCTION

We are pleased to provide feedback on the PCAOB’s *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (PCAOB 2023b) (the “proposal” or “Release”).¹ In the following sections, we provide our responses to the questions.

It is important to note that in our answers to Questions 1 – 12 below, we seek to offer suggestions that will improve the proposed standard and make it more complete, *viewing the issuance of a new standard as a given*. By contrast, when we subsequently consider the economic analysis underlying the proposed standard, *we do not view new standard setting as a given*. Rather, we consider how well the economic analysis establishes a solid foundation for new standard setting.

II. RESPONSES TO QUESTIONS

Question 1: Does the description of auditors’ use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors’ use of technology-assisted analysis that we should consider?

In general, we believe the proposal’s description of auditors’ use of technology-assisted analysis in designing and performing audit procedures accurately depicts the current audit practice, for the most part. For example, as described in Titera (2013) and the Release, technology-assisted analysis can happen in any stage of an audit (from planning to reporting, and from risk assessment

¹ We adapt or use language from PCAOB (2023b) and other PCAOB resources.

to substantive tests). However, we believe there are multiple additional areas to consider from current practice that should be addressed in the proposed amendments.

First, the proposed amendments are designed to cover only the phases of designing and performing audit procedures. It is therefore missing guidance and examples regarding the use of technology-assisted analysis in risk assessments. Multiple research studies demonstrate that technology-assisted analysis improves audit quality in risk assessments (Wang and Cuthbertson 2015; Eilifsen, Kinserdal, Messier, and McKee 2020). Therefore, we encourage the PCAOB to amend the audit standards relating to technology-assisted analysis in risk assessments to meet the needs of the current audit practice.

Second, technology-assisted analysis can allow auditors to conduct test of details on 100 percent of a population of transactions and to perform continuous auditing of balances (Issa, Sun, and Vasarhelyi 2016). Recent interview, survey, and case research also demonstrates that auditors use robotic process automation (RPA) technologies to achieve enhanced efficiency when performing a test of details (Eulerich, Pawlowski, Waddoups, and Wood 2022). Therefore, the nature, timing, and extent of tests of details have drastically changed with technology-assisted analysis. In response to this change, we encourage the PCAOB to provide updated guidance regarding the nature and timing of tests of details.

Third, we believe that the proposed standard would be strengthened with guidance or examples regarding the procedures for data preparation and data validation. As the Release notes on page 25, the standard is being amended “to address the risk that the external information maintained by the company and provided to the auditor to be used as audit evidence may be incomplete or inaccurate.” With the advancement of modern analytical tools, auditors obtain stronger capabilities and greater confidence in preparing and validating client data before

conducting analyses (Moffitt, Rozario, and Vasarhelyi 2018). For example, auditors may use data preparation tools (e.g., Alteryx) to clean and join client datasets and then load them into audit analytics tools for testing (O’Brien and Stone 2021). In contrast, the current PCAOB standard does not provide guidance about how auditors should appropriately prepare and validate client data. Thus, we encourage the PCAOB to include guidance and/or examples regarding data preparation and data validation.

Fourth, while we agree that the Release accurately describes most aspects of designing and performing audit procedures and that improvements within the standards are necessary, the scope of this amendment is limited. Specifically, page 5 of the release states, “The Board’s proposal is focused on addressing aspects of technology-assisted analysis and *does not address other technology applications used in audits (e.g., blockchain or artificial intelligence) or the evaluation of the appropriateness of tools by the firm’s system of quality control*” (emphasis added). We believe these italicized areas should be addressed within the standards as well. Both practitioners and academics have realized the significant impact of adopting artificial intelligence (AI) technologies in auditing. For example, in response to the recent popularity of generative AI tools (e.g., ChatGPT), PwC has announced an investment of \$1 billion to expand and scale AI capabilities (PwC 2023). Both empirical results on AI investment and interview insights from audit partners show that the deployment of AI improves audit quality (A. Fedyk, Hodson, Khimich, and T. Fedyk 2022). However, research also finds negative consequences of AI adoption in auditing, such as algorithm aversion (i.e., discounting the advice from AI) (Commerford, Dennis, Joe, and Ulla 2022). Additionally, audit firm size can drive the degree of AI/robotics adoption, and robust adoption of technologies often happens only in larger audit firms (Bakarich and O’Brien 2021). Given the pros and cons in AI adoption in auditing, we believe it is necessary for the PCAOB to

be forward-thinking and to regulate this area and enhance auditors' confidence when leveraging the capabilities of AI in auditing.

Finally, we also encourage a minor clarification within the proposed amendments. In paragraph .10A part (b), the Release could clarify that the auditor would "test controls over the company's procedures in part (a)..."

Question 2: Does the release accurately describe aspects of designing and performing audit procedures involving technology-assisted analysis where improvements to PCAOB standards may be necessary?

Please refer to our response for Question 1.

Question 3: In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?

Please refer to our response for Question 1.

Question 4: Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

The proposal indicates that the current standards only provide examples of substantive procedures and do not provide descriptions that differentiate between tests of details and analytical procedures. We agree that this lack of differentiation should be clarified by standard setters to ensure that sufficient appropriate audit evidence is collected, in general, and specifically within the context of this proposal (i.e., when using technology-assisted tools during tests of detail).

As the Release notes, auditors are using technology-assisted procedures for various procedures, including risk assessment, tests of details, and substantive analytical procedures. The

amended standard seeks to clarify that tests of details include substantive procedures that examine individual items, whereas substantive analytical procedures typically do not (unless an individual item explains a significant difference within the procedure). We believe that this differentiation is appropriately clear in the amended standard. However, it is not clear how these particular changes to AS 1105 will necessarily “increase the likelihood that auditors obtain sufficient appropriate audit evidence *when using technology-assisted analysis...*” (emphasis added). For example, the proposed amendments to .13 and .21 do not reference or differentiate between technology-assisted versus non-technology-assisted procedures. These changes to the standards, therefore, do not resolve the question asked on page 14 about whether technology-assisted analysis can be a test of details and not an analytical procedure. We encourage the PCAOB to offer clarifying language or examples to paragraphs .13-.21 to provide examples, context, and/or clarification for auditors when they use a technology-assisted analysis for either tests of details or analytical procedures.

Question 5: Would the proposed amendment that states that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure improve the auditor’s evaluation of the relevance of audit evidence? If not, what changes should be made?

The proposed amendment seeks to clarify AS 1105 to indicate that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure. Based on the changes being proposed, we believe the auditor’s evaluation of the relevance of audit evidence should improve for both technology-assisted and non-technology-assisted procedures. The proposed amendment to .07 does not, however, mention or differentiate between technology-assisted versus non-technology-assisted procedures. Based on the proposal’s intent to address the growing use of certain technology in audit procedures, we

believe more clarification is needed on how this amendment specifically improves testing with technology-assisted procedures. We encourage the PCAOB to offer clarifying language or examples to paragraphs .07 and/or .13-.21 to provide examples, context, and/or clarification for auditors when they use a technology-assisted analysis for either tests of details or analytical procedures.

Question 6: Are the proposed requirements that specify the auditor’s responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

The proposed standard seeks to update AS 1105.14 for auditors who use audit evidence from an audit procedure to achieve more than one objective. We believe that the proposed amendments are clear and appropriate. However, the proposed amendment to .14 does not mention or differentiate between technology-assisted versus non-technology-assisted procedures. Based on the proposal’s intent to address the growing use of certain technology in audits, we believe more clarification is needed on how this amendment specifically improves testing with technology-assisted procedures. We encourage the PCAOB to offer clarifying language or examples to paragraphs .13-.21 to provide examples, context, and/or clarification for auditors when they use a technology-assisted analysis for either tests of details or analytical procedures.

Question 7: Would the proposed amendments, that specify considerations for the auditor’s investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

The considerations specified in paragraph .37A direct the auditor to consider the broader effects of investigating identified items. These effects may include raising questions about the original risk assessment, suggesting new risks of material misstatement, identifying misstatements or internal control deficiencies, or suggesting a need to modify the audit approach. We believe that highlighting these considerations is appropriate, as prior research indicates that auditors sometimes struggle to adequately respond to identified risks (e.g., Beasley, Carcello, Hermanson, and Neal 2013).

Regarding investigating identified items, the Release states, “The proposed amendments would not prescribe the nature, timing, or extent of procedures for investigating the identified items” (p. 22). Despite this language, there may be auditor uncertainty regarding the handling of large numbers of identified items. The proposed amendments should acknowledge that the auditor has to balance costs versus benefits in deciding what to test. For example, if thousands of items are deemed to be an exception in a test designated as a substantive procedure, the standard should indicate that the auditor should use professional judgment in deciding whether it is feasible to test all exceptions. Alternatively, the auditor should document the considerations in deciding what to examine further to obtain sufficient evidence.

Failing to explicitly acknowledge that the auditor has to weigh costs and benefits may encourage the auditor to forego analytics that may identify a large number of exceptions, particularly when using computerized techniques to test 100 percent of the transactions. Barr-Pulliam, Brown-Liburd, and Munoko (2022) note that “uncertainty about regulators’ response and acceptance of emerging technologies can hinder its adoption” (p. 349). Arguably, if auditors are uncertain as to how regulators will view the examination of exceptions identified as part of substantive testing, auditors may forego this potentially useful tool. Greater clarity needs to be

included as to how the auditor will address large numbers of exceptions when using analytics as part of substantive testing or when testing 100 percent of items in a population.

Question 8: What other factors, if any, should the auditor consider when investigating items that meet criteria established by the auditor when designing or performing substantive procedures?

As noted in the response to Question 7, the standard should address costs versus benefits of testing 100 percent of exceptions. Further, the standard should acknowledge that auditors are not required to test 100 percent of exceptions if they can use alternative measures (sampling, isolating errors) to examine the exceptions.

Further, continuous monitoring/assurance could impact the nature, timing, and even scope of substantive testing. Barr-Pulliam et al. (2022) indicate, “For example, instead of obtaining printouts of transactions from the client’s enterprise resource planning (ERP) for substantive testing, the emerging technology may require a direct connection to the client’s ERP for continuous monitoring/assurance. Client data security preferences and digitization capabilities influence auditors’ emerging technology deployment” (p. 348).

Question 9: Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

The standard does not directly address some issues that may be relevant. First is whether the auditor has to validate that the information created by others, but maintained by the company, is reliable when the company receives the information. A company may receive unreliable information but have strong controls over that bad information. Second, in addition to information

maintained by the client, the auditor may use third party information, for example, data from the Federal government, in analytics involving non-financial information. Does the auditor have a responsibility to validate the reliability of this type of information that was not created or maintained by the client? Arguably, the auditor would be relying on outside information without any comfort that the information is accurate. Finally, the appropriateness of the paragraph depends on whether the auditor should be responsible for controls over all information, or only information related to financial reporting.

Further, in our response to Question 1 above, we discuss the need to provide guidance for data preparation and data validation (Moffitt et al. 2018; O'Brien and Stone 2021). These same issues of data preparation and data validation may apply to the process of evaluating external information maintained by the company in electronic form.

Question 10: Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

Please refer to our response for Question 9.

Question 11: When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

We believe that the Board needs to tread carefully in this area. Currently, the auditor has the responsibility for testing internal control over financial reporting (ICFR). Requiring the auditor to consider all information controls, depending on how far this extends, may significantly expand

the scope of auditor testing. For example, information obtained from outsourced third-party vendors would seem to apply for this standard. Presumably, auditors now rely on System and Organization Controls (SOC) 1 reports by third parties that are relevant to ICFR. It is possible that this standard expands the reliance to include reviewing SOC 2 reports if those reports relate to nonfinancial information used by the auditor. Further, the Board may be inadvertently expanding the auditors' scope to include controls over the collection of all information, not just that related to the financial statements. If there is a perceived need to test controls over all data outside of the system that creates financial data, we question whether such a change should come through audit standards.

Question 12: Are the proposed amendments that update certain terminology in AS 1105 clear and appropriate? If not, what changes should be made?

These definitions appear clear and appropriate. See also responses to Questions 4 – 6.

Economic Analysis: Other Research to Consider (Questions 13, 14, and 17)

In addition to the studies cited in the Release, we call the Board's attention to other recent research that may be useful as the Board continues to oversee auditors' use of data analytics (DA). Specifically, we highlight selected studies in three areas: (1) the perceived impact of DA on auditing and financial reporting quality, (2) factors affecting auditors' use of and reliance on DA, and (3) suggestions for optimizing auditors' DA use. This literature relates to Questions 13, 14, and 17 in the Release.

Perceived Impact of DA on Auditing and Financial Reporting Quality

Two studies provide evidence of the perceived positive effects of DA use on auditing and financial reporting quality. Kend and Nguyen (2020) conduct interviews and focus groups with auditing stakeholders in Australia. They find that stakeholders view the impact of DA on auditing

as positive, in part because it provides auditors with more time to apply judgment in critical areas. The stakeholders also call on regulators to “keep on track with the fast-paced IT, automation evolution in the auditing field” (p. 269). Saleh, Marei, Ayoush, and Abu Afifa (2023) conduct interviews of Canadian auditors and find evidence that auditors believe that DA use significantly improves financial reporting quality. In both studies, there is evidence that auditors and stakeholders perceive considerable benefits of DA use.

Factors Affecting Auditors’ Use of and Reliance on DA

Several studies examine issues related to auditors’ use of and reliance on DA. Jacky and Sulaiman (2022) analyze the content of comment letters submitted to the International Auditing and Assurance Standards Board’s Data Analytics Working Group. The authors find that many factors affect auditors’ use of DA, including “the usefulness of DA in auditing, authoritative guidance (auditing standards), data reliability and quality, auditors’ skills, [and] clients’ factors and costs” (p. 31).

Cao, Duh, Tan, and Xu (2022, 131) examine auditors’ reluctance to rely on DA, in part due to a fear that inspectors “will second-guess the audit evidence gathered using DA” (see Gepp, Linnenluecke, O’Neill, and Smith 2018; Austin, Carpenter, Christ, and Nielson 2021). The authors conduct an experiment with Big 4 auditors, manipulating inspection risk as low or high and auditor mindset as “fixed” (auditors are focused on performance and being judged) or “growth” (auditors are focused on learning and improving). The authors find that “relative to low inspection risk, high inspection risk reduces auditors’ reliance on DA when auditors are prompted to adopt a fixed mindset but increases it when auditors are prompted to adopt a growth mindset” (p. 131). Thus, when inspection risk is high, the effect on auditor DA use depends on the auditor’s mindset.

Schmidt, Riley, and Swanson Church (2020) use a survey approach to understand accounting and finance professionals' resistance to move beyond Excel and adopt DA. They find that the benefits of switching to DA and the perceived value of DA reduce DA resistance, while costs to switch to DA increase resistance.²

Koreff (2022) examines factors that affect auditors' judgments when using DA. He conducts an experiment that manipulates whether the DA tool identifies anomalies or makes predictions and whether the data used by the DA tool are financial or nonfinancial. He finds that both the type of DA model and type of data affect auditors' decisions regarding time budgets. Auditors increase time budgets more when financial data are used in predictive DA models and when nonfinancial data are used in anomaly DA models.

Barr-Pulliam, Brazel, McCallen, and Walker (2023) experimentally examine the effects of false positives and auditor rewards on auditor skepticism when using DA. Auditors are more likely to disregard DA results when false positives are high. Auditors are more likely to respond to DA-generated red flags when false positives are low, and auditors are consistently rewarded for being skeptical. Further, the authors find that when false positive rates are very low, auditors tend to discuss the red flag with their manager before formally pursuing the red flag. Overall, the results suggest the importance of well-calibrated DA tools and consistent rewards for auditor skepticism.

Finally, Barr-Pulliam, Brown-Libur, and Sanderson (2022) examine the effects of auditors' DA through the lens of jurors' assessments of auditor negligence. The authors conduct an experiment manipulating the opinion on internal control over financial reporting (ICFR, unqualified or adverse) and the audit testing method (statistical sampling or audit DA). The authors

² Also see Dagiliene and Kloviene (2019) for evidence from the Lithuanian context on factors affecting auditors' use of DA.

find that when the ICFR opinion is unqualified, jurors' assessments of auditor negligence are lower when auditors use DA, rather than statistical sampling.

Suggestions for Optimizing Auditors' DA Use

Two recent papers offer insights for improving auditors' DA use. No, Lee, Huang, and Li (2019) present the Multidimensional Audit Data Selection (MADS) framework to provide a systematic approach to DA use, including how to address a large number of outliers. The authors explain, "The MADS framework ...[identifies] outliers based on multidimensional criteria and then prioritiz[es] the outliers to help auditors focus on the most problematic items while performing substantive tests of details" (p. 128).

Yoon and Pearce (2021) assess findings from 21 prior studies and offer their insights into auditors' use of substantive analytical procedures, including procedures based on advanced analytics models. The authors note the limitations of certain substantive analytical procedures related to revenue, and they encourage complementary use of audit sampling and substantive analytical procedures.

Economic Analysis: Process (Questions 14 – 19)

The PCAOB has adopted a framework to conduct an economic analysis of all new and potential regulations. This framework has four main elements: (1) the need for the rule, (2) the baseline for measuring the rule impacts, (3) the alternatives considered, and (4) the economic impacts of the rule (and alternatives), including the benefits and costs (PCAOB 2023a). In submissions to prior proposed standards in 2023, we observed that the economic analysis had fallen short of this framework. This motivates our discussion of the economic analysis regarding technology-assisted analysis of information in electronic form.

One important clarification is in order with respect to this section of our response. In our answers to Questions 1 – 12 above, we seek to offer suggestions that will improve the proposed standard and make it more complete, *viewing the issuance of a new standard as a given*. By contrast, in this section, we consider the economic analysis underlying the proposed standard (including the need for standard setting to address technology-assisted analysis) at a higher level. In this economic analysis section, *we do not view new standard setting as a given*. Rather, we consider how well the economic analysis supports new standard setting.

The Need for the Rule and Alternatives Considered

The Board asserts that “advancements in technology have enabled auditors to expand the use of technology-assisted analysis in audits. If not designed and executed in accordance with PCAOB standards, audit procedures that involve analyzing information in electronic form with technology-based tools may not provide sufficient appropriate audit evidence” (p. 4). However, the proposed solution mainly clarifies existing requirements, highlighting that AS 1105, *Audit Evidence* (PCAOB 2010a), and AS 2301, *The Auditor’s Responses to the Risk of Material Misstatement* (PCAOB 2010b), apply to technology-assisted analysis of issuer information. These clarifications take the form of renaming “records and documents” as “information” and identifying that such information may be stored in an electronic format. The proposal also clarifies the differences between tests of detail and analytical procedures. Although we expected a robust examination of alternatives, we agree that neither a separate technology proposal nor a data analysis definition is appropriate. Thus, one could argue that staff guidance would seem adequate to communicate the requirements of the two standards. However, as the Board has undertaken a modernization initiative to update older standards to reflect the current environment (PCAOB

2022a, 10), it appears reasonable to change the language around evidence (e.g., that “records and documents” become “information”).

Economic Analysis and Unintended Consequences

The Board asserts its research suggests the need to “more specifically address aspects of audit procedures that involve technology-assisted analysis” (PCAOB 2023b, 5). However, the Release does not provide concrete, persuasive evidence of the need. Further, although economic analysis should consider both qualitative and quantitative impacts of proposed rulemaking, we do not observe either. The cited research is limited to a description of the tools used by large multinational audit firms (PCAOB 2023b, 28) or survey data describing how DA is or could be integrated into the audit (PCAOB 2023b, 29). The link between the proposed changes and the tool descriptions is missing for large multinational audit firms. The research on incorporating DA into the audit suggests that firms should be doing more. However, it is unclear why the Board would imply the need for greater DA adoption in its rationale, yet remain silent in the standards themselves.

In prior proposals, the Board has made significant efforts to consider the scalability of its proposals for smaller firms. As the Board inspects over 200 audit firms and 800 engagements annually (PCAOB 2022b), it appears that a rich data set exists to describe how the large firms are improperly using the approved tools. Alternatively, although the Release describes survey data on the use of DA, the Board should have that data in the inspection files. The PCAOB’s economic analysis framework would suggest a rigorous analysis of these inspection files, detailing the nature and frequency of the misuse of technology tools or data analysis. Instead, the proposal speculates where and how auditors might become confused (e.g., “For example, currently some auditors might not appropriately investigate items identified when using technology-assisted analysis in

designing and performing substantive procedures” p. 41). Further, it is unclear why technology-assisted analysis is more prone to inappropriately designed multiple-purpose audit procedures than current practice.

We believe costs and benefits are idiosyncratic to each firm’s and engagement’s economics, and some may be skeptical that the current proposal will differ from the prior evidence standard on the likelihood of not obtaining sufficient appropriate audit evidence. The Release’s focus on technology presents a potential unintended consequence. Although the proposed changes are not restricted to technology, auditors may view the modifications as increasing technology usage requirements. In addition, the proposal appears to suggest the Board is encouraging audit firms to adopt such technology, not to guide its use. The suggestion that firms might forgo using a technology that may negatively impact audit quality seems to suggest making tools required (PCAOB 2023b, 41). This apparent encouragement is troubling for two reasons. First, as the Board has not quantified costs or benefits, there is no basis for evaluation. Second, the supposition that efficiencies would accrue to the firms, potentially impacting audit efficiencies or even audit fees, is beyond the Board’s charge of improving audit quality. Instead, we would expect the Board to be agnostic about auditors’ decisions regarding the tradeoffs of technology usage, instead focusing on the objectives of the audit. Whether an auditor uses technology is not a market failure requiring a regulatory solution.

Overall, we continue to have concerns about the economic analyses of proposed audit standards. In this case, it seems that the clarifications made could have been achieved more efficiently. Having said that, our answers to Questions 1 – 12 are designed to improve the proposed standard and make it more complete, given that standard setting is the approach that the PCAOB is taking in this area.

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August 28, 2023

Via E-mail: comments@pcaobus.org

Office of the Secretary
 Public Company Accounting Oversight Board
 1666 K Street, NW
 Washington, DC 20006-2803

Re: PCAOB Rulemaking Docket Matter No. 052

Dear Office of the Secretary:

BDO USA, P.A. appreciates the opportunity to comment on the Public Company Accounting Oversight Board (“PCAOB” or the “Board”) *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (the release).

We are supportive of the Board’s overall objectives of improving audit quality and enhancing investor protection by clarifying and strengthening requirements in the existing standards related to aspects of designing and performing audit procedures that involve technology-assisted analysis. Our comments and suggestions are outlined by topic in this letter.

A. Differences Between Tests of Details and Analytical Procedures and Appropriate Disaggregation or Detail of Information

We support the Board’s objectives of clarifying the difference between the terms “tests of details” and “analytical procedures” in the proposed amendments. We find the proposed amendments to paragraphs .13 and .21 of AS 1105 to be clear and appropriate with one exception, where the language in the proposed amendments states that “*analytical procedures generally do not involve evaluating individual items included in an account or disclosure [emphasis added], unless those items are part of the auditor’s investigation of significant differences from expected amounts.*”¹

Based on our experience, audit procedures using technology-assisted analysis enable the auditor to: (i) analyze large volumes of transactions at an individual item or transaction level within a population (e.g., an account or class of transaction), and (ii) examine the company’s recorded transactions to other related information from a variety of sources that are both internal and external to the company. Such procedures are capable of providing audit evidence that can be used to:

- provide a basis for the auditor’s identification and assessment of risks of material misstatement;

¹ See proposed amendments to AS 1105.13 and .21



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- provide corroborative evidence for assertions about classes of transactions or account balances; and
- support the auditor’s reliance on the completeness and accuracy of financial information used in the performance of other audit procedures.

As noted in the release “[t]he proposed amendments are principles-based and therefore are intended to be adaptable to the ever-evolving nature of technology.”² To ensure that the proposed amendments remain relevant and adaptable to the evolving capabilities of technology-assisted analysis in practice, we suggest the following revisions to the proposed AS 1105.13 and .21.

Suggested language to be added is shown in boldface underlined italics and the suggested language to be deleted is shown in strikethrough.

.13 Audit procedures can be classified into the following categories:

- Risk assessment procedures, [footnote excluded] and*
- Further audit procedures, [footnote excluded] which consist of:*
 - Tests of controls, and*
 - Substantive procedures, including tests of details and substantive analytical procedures.*

*Note: A test of details involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures ~~generally do~~ **may not necessarily** involve evaluating individual items included in an account or disclosure, ~~unless those items are part of the auditor’s investigation of significant differences from expected amounts~~ **depending on the objective of the audit procedure.** [footnote excluded]*

*.21 Analytical procedures consist of evaluations of financial information made by an analysis of plausible relationships among both financial and nonfinancial data that can be external or company-produced. Analytical procedures also encompass the investigation of significant differences from expected amounts. Unlike tests of details, analytical procedures ~~generally do~~ **may not necessarily** involve evaluating individual items included in an account or disclosure, ~~unless those items are part of the auditor’s investigation of significant differences from expected amounts~~ **depending on the objective of the audit procedure.** [Footnote excluded]*

² See page 5 of the release.



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B. Responsibilities When Using Audit Evidence for More Than One Purpose

We support the proposed amendments to AS 1105.14 to specify that if an auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure to achieve each of the relevant objectives. However, we believe that the proposed requirements could be further enhanced by acknowledging the exploratory and iterative nature of audit procedures that can be designed and performed using technology-assisted analysis and the cumulative nature of audit evidence obtained from performing various procedures during the audit.

Specifically, the use of technology-assisted analysis has enabled auditors to examine entire population of transactions and corroborate information at an individual transaction level across multiple sources. In our experience, such procedures are capable of providing more persuasive audit evidence than traditional audit procedures. As noted in the release, “[b]ecause of the wide variety of analyses that may be applied by the auditor, it would be impractical to anticipate what a particular investigation could entail or what information it may provide to the auditor.”³

For example, an audit procedure may be designed as a risk assessment procedure; however, the technology-assisted analysis performed as part of the procedure may provide corroborative evidence for assertions about classes of transactions or account balances or other evidence regarding the completeness and accuracy of information produced by the company that is used in the performance of other audit procedures. As noted in existing AS 1105.02, audit evidence is “*all the information, whether obtained from audit procedures or other sources [emphasis added]*, that is used by the auditor in arriving at the conclusions on which the auditor’s opinion is based.”

C. Investigation of Items When Designing or Performing Substantive Audit Procedures

We are supportive of the Board’s objectives to modify the existing standards to specify the auditor’s responsibilities regarding addressing specific items identified when designing and performing substantive audit procedures. The release states that the new proposed paragraph AS 2301.37A “supplement existing direction in PCAOB standards.”⁴ However, we believe these proposed amendments should be further clarified for the reasons described below:

- 1) The requirements in proposed paragraph AS 2301.37A appear to be consistent with the existing requirements in the standards.⁵ For example, existing paragraphs AS 2110.74 and AS 2301.46 establish auditor responsibilities to consider contradictory

³ See page 22 of the release.

⁴ See page 21 of the release.

⁵ Existing requirements in AS 1215, *Audit Documentation*, AS 2110, *Identifying and Assessing Risks of Material Misstatement*, and AS 2310, *The Auditor’s Responses to the Risks of Material Misstatement*.



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audit evidence and its impact on the audit, including revisions to risk assessment and modifications of planned audit procedures. As a result, it is unclear how the proposed new paragraph AS 2301.37A supplements or enhances the existing requirements in the standards.

- 2) As described in the release, “technology-assisted analysis may enable the auditor to examine all items in a population, it is possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor.”⁶ Assuming such items or transactions within a population exhibit similar characteristics, it is unclear whether the proposed amendments: (a) establish a presumptively mandatory responsibility for the auditor to test a 100% of the items or transactions within a population that meet the auditor’s established criteria for further investigation (i.e., the sub-population), or (b) enable the auditor to exercise professional judgment in determining the appropriate number of transactions or items to select and test to reach a conclusion on the sub-population. We believe it is important that the Board clarify the auditor requirements with respect to the points above.
- 3) On the other hand, if the auditor establishes appropriate criteria for selection of items for further investigation within a population as part of its substantive procedures using technology-assisted analysis, and the auditor’s analysis results in no items, it is unclear whether such scenarios could, in any circumstance, provide sufficient and appropriate audit evidence in responding to risks of material misstatement.
- 4) The discussions within Section III.C of the release (pages 20 - 23) describes the design and performance of risk assessment procedures and substantive procedures in response to risks where an auditor may establish criteria and identify and investigate specific items; however, the proposed amendments only apply to AS 2301 and the release text describes an example relating to the auditor’s risk assessment procedure in the context of applying the proposed new paragraph in AS 2301.37A. Further clarification to this section of the release would be helpful to better align the example to the proposed changes.

D. Specifying Auditor Responsibilities for Evaluating the Reliability of Certain Audit Evidence

We support the Board’s objectives to specify the auditor’s responsibilities regarding the reliability of external information maintained by the company in electronic form and used as audit evidence; however, we find various aspects of proposed AS 1105.10A to be unclear or not achievable in certain circumstances as described in more details below.

- 1) AS 1105.10 permits the auditor to perform procedures to (a) test the accuracy and

⁶ See page 21 of the release.



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completeness of information, or (b) test the company's controls over the accuracy and completeness of information to be used as audit evidence. Similarly, AS 2305.16 permits the auditor perform either (a) or (b) above to evaluate the reliability of information used in the performance of substantive analytical procedures. However, proposed AS 1105.10A does not provide the auditor with the option to performing other auditor procedures to evaluate the reliability of external information maintained by the company in electronic form. We believe that additional clarifications to the proposed amendments are necessary to enable the auditor to perform other audit procedures (other than tests of controls) to evaluate the reliability of external information maintained by the company. We believe, in various situations, other audit procedures may be designed and performed to address the risks arising from the use of information technology (IT) and evaluating the reliability of external information maintained in the company's information system.

- 2) Subpart (b) of proposed AS 1105.10A establishes requirements for the auditor to perform tests controls (including information technology general controls and automated application controls) over the company's procedures discussed in subpart (a) of the proposed paragraph or *test the company's procedures* [emphasis added] discussed in subpart (a). The nature of the audit procedures that are required to be performed to "test the company's procedures" in accordance with the proposed requirements are not sufficiently clear.

Further, subpart (b) of proposed AS 1105.10A establishes a presumptively mandatory responsibility for the auditor to perform tests of controls (including information technology general controls and automated application controls) or test the company's procedures in all circumstances in which the company provides information to the auditor that it received from external sources. While we appreciate that in some cases, the reliability of information may only be established when the related controls including those over the company's procedures discussed in subpart (a) have been tested and determined to be operating effectively, we do not believe that tests of controls are necessary in all circumstances. We believe the auditor should be able to make an informed judgment about the reliability of the external information based on various factors. PCAOB Staff Guidance states that "Overall, as the risk of material misstatement increases, the amount of evidence that the auditor should obtain also increases. Additionally, greater relevance and reliability of audit evidence are needed to address higher levels of risk."⁷ For example, when the information is from a credible authoritative source, the extent of the auditor's further audit procedures may be less extensive, such as corroborating the information with the source's website or published information.

⁷ See page 4 of [Staff Guidance - Insights for Auditors Evaluating Relevance and Reliability of Audit Evidence Obtained From External Sources](#) (October 2021)



Office of the Secretary
Public Company Accounting Oversight Board
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Effective Date

We believe that there are certain aspects of the proposed standard and related amendments that will require additional time, beyond the proposed effective date noted in the release, to design and implement necessary changes to firm methodologies, tools, and to provide training. We recommend an effective date of audits of periods ending on or after December 15 at least one year after approval by the SEC. Therefore, assuming SEC approval occurs during 2024, we recommend the final standard be effective no earlier than for audits with fiscal years beginning on or after December 15, 2025.

* * * *

We appreciate your consideration of our comments and suggestions and would be pleased to discuss them with you at your convenience. Please direct any questions to Ashwin Chandran at 214-689-5667 (achandran@bdo.com), or James D'Arcangelo at 203-905-6234 (jdarcangelo@bdo.com).

Very sincerely,

BDO USA, P.A.

BDO USA, P.A.



August 28, 2023

By email: comments@pcaobus.org

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street, NW
Washington, DC 20006-2803

Re: Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form; PCAOB Rulemaking Docket Matter No. 052

Dear Office of the Secretary:

The Center for Audit Quality (CAQ) is a nonpartisan public policy organization serving as the voice of U.S. public company auditors and matters related to the audits of public companies. The CAQ promotes high-quality performance by U.S. public company auditors; convenes capital market stakeholders to advance the discussion of critical issues affecting audit quality, U.S. public company reporting, and investor trust in the capital markets; and using independent research and analyses, champions policies and standards that bolster and support the effectiveness and responsiveness of U.S. public company auditor firm and audits to dynamic market conditions. This letter represents the observations of the CAQ based upon feedback and discussions with certain of our member firms, but not necessarily the views of any specific firm, individual, or CAQ Governing Board member.

Support and General Observations

This letter sets forth our views on the Public Company Accounting Oversight Board's (PCAOB or the Board) Technology-Assisted Analysis proposal to amend AS 1105 *Audit Evidence* and AS 2301 *The Auditor's Responses to the Risks of Material Misstatement*.

The CAQ is supportive of the Board's objective to provide greater guidance and clarity for auditors when using technology-assisted analysis within the audit as the use of technology-assisted analysis in the audit continues to become more pervasive.

We commend the PCAOB on the outreach performed to date related to technology, which has been conducted with a wide range of stakeholders in the profession, the PCAOB's Data and Technology Task



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Force, the previous Standing Advisory Group, as well as the current PCAOB advisory groups: the Investor Advisory Group (IAG) and the Standards and Emerging Issues Advisory Group (SEIAG). As technology continues to evolve at a rapid pace, additional topics and questions are likely to arise related to the use of technology in the audit and how these technologies improve audit quality. We recommend that the PCAOB continue to engage with the audit profession, key technology providers, and others to understand emerging technology-related topics and assess whether and how the PCAOB can most appropriately address such emerging topics on a timely and priority basis as they arise.

In particular, while we recognize that the proposed amendments are intentionally focused on providing clarity regarding the use of technology-assisted analysis within the *existing* framework for audit evidence in the PCAOB standards, we encourage the Board to potentially think broader about technology, the audit, and audit quality. As one example, we believe that there remains an opportunity for the PCAOB to reconsider the binary classification of substantive procedures and instead focus solely on the sufficiency and appropriateness of audit evidence obtained by an audit procedure. While these distinctions are historic and thus known to auditors and PCAOB inspection professionals, we believe a better focus is on the substance of the audit evidence versus the classification. The CAQ welcomes the opportunity to engage in further dialogue with the PCAOB and especially the Board's Technology Innovation Alliance Working Group on these topics.

Summary of Significant Feedback on the Proposed Amendments

In our responses to the specific questions outlined in the Release, we offer feedback on certain proposed requirements for which we believe additional clarifications or edits would be beneficial. As we are generally supportive of the amendments, we have only responded to questions where we have specific feedback or recommendations. Our most significant comments are as follows:

- **Clarification provided by defining tests of details**

We support the clarification in AS 1105.13(b), which states that a test of details (TOD) involves performing procedures with respect to individual items included in an account or disclosure. While the statement “analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor’s investigation of significant differences from expected amounts” was true in the past, it may not be currently. Specifically, as it relates to analytical procedures enabled by technology, plausible relationships among data and related expectations can, in certain circumstances, be developed at the individual item level. As such, we recommend that the discussion on analytical procedures be removed from the note to AS 1105.13.

- **Evaluating the reliability of external information maintained by the company in electronic form**

It is helpful that the proposal provides additional guidance regarding the reliability of external information maintained by the company in electronic form. As we discuss in our response to questions 9 and 10, we offer this feedback:

- It would be helpful if the Board would provide examples of external information maintained by the company *in its information systems* in electronic form to alleviate uncertainty regarding what is meant by “in its information systems.”



- It would be helpful if the Board could clarify the phrase “test the company’s procedures” used in AS 1105.10A, as this phrase is not used elsewhere within PCAOB standards.
 - We believe that AS 1105.10A should provide the auditor with the ability to directly perform procedures to evaluate the reliability of external information maintained by the company in its information systems in electronic form.
 - We do not agree with the requirements in AS 1105.10A(b) that appear to require testing of information technology general controls and application controls in all circumstances (where the auditor chooses to test controls rather than testing the company’s procedures). We believe that the auditor should be permitted to determine the degree of control testing required based on the auditor’s risk assessment.
 - We recommend updates to the discussion of “original documents” in AS 1105.08, which relates to the reliability of evidence provided by information in electronic form.
- **Investigation of items meeting the criteria established by the auditor when designing and performing substantive procedures**

We believe that there is an opportunity for the PCAOB to provide additional guidance to auditors on key topics related to the investigation of items meeting the criteria established by the auditor. Specifically, clarification would be helpful related to certain situations that the auditor may face when performing audit procedures over 100% of the population using technology-assisted analysis. See further discussion in our response to question 7.

Support for a Scalable Approach to the Use of Technology-Assisted Analysis in Audits

We believe that significant benefits can be realized by employing technology-assisted analysis on audit engagements, including, as highlighted in the Release, designing and performing audit procedures more effectively and efficiently, ultimately leading to higher audit quality.¹ Technology-assisted analysis may enable the auditor to identify and analyze financial relationships, providing auditors with new insights and the ability to form more detailed views about the likelihood and potential magnitude of risks of material misstatement, and also to obtain persuasive audit evidence.

Notwithstanding our views on the benefits of technology-assisted analysis, we appreciate that PCAOB standards continue to enable auditors to employ audit procedures that are appropriate based on the engagement-specific facts and circumstances, recognizing that technology-assisted analysis may not be the most effective option and therefore its use should not be expected on all audits. We believe that this is particularly important for the proposal to be scalable for firms (and the companies they audit) of all sizes and with varying technological resources. There can be significant costs associated with performing technology-assisted analysis. Costs to obtain and prepare company data for analysis can vary significantly depending on the enterprise resource planning (ERP) system used by the company and the type and format of available data. In addition, the need to involve specialists or others outside the core engagement team may vary depending on the nature and complexity of the technology-assisted analysis to be

¹ PCAOB Release No. 2023-004, page 35.



performed. In some circumstances, it may not be possible to perform procedures using technology-assisted analysis due to the lack of data or format of data available from the company.

Specific Feedback

3. *In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?*

In addition to our general observations above, the Board's upcoming proposal related to substantive analytical procedures (SAP) (AS 2305) is also important to address the use of technology-assisted analysis in audits. The SAP project provides an opportunity to reconsider the presumption that it is unlikely that audit evidence obtained from SAPs alone will be sufficient to respond to significant risks. We believe that the use of technology-assisted analysis in performing SAPs may enable auditors to perform SAPs with higher levels of precision that may provide the auditor with sufficient and appropriate audit evidence to address significant risks and may enhance the auditor's procedures to detect fraud.

4. *Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?*

In addition to our general observations above, we are supportive of the Board's intent to describe TODs as they currently are not defined in the PCAOB standards, and we agree that a TOD involves performing procedures with respect to individual items included in an account or disclosure. However, we offer the following feedback for consideration on this topic.

We believe that analytical procedures are clearly defined in the PCAOB standards and are well-understood by auditors. AS 2305.02 states that SAPs "consist of evaluations of financial information made by a study of plausible relationships among both financial and nonfinancial data. Analytical procedures range from simple comparisons to the use of complex models involving many relationships and elements of data. A basic premise underlying the application of analytical procedures is that plausible relationships among data may reasonably be expected to exist and continue in the absence of known conditions to the contrary." We believe that this definition coupled with the new definition of TODs provides helpful guidance to auditors to determine the appropriate classification of an audit procedure.

We appreciate the intent to describe TODs. However, we do not believe that the comparison to SAPs is necessary. The current proposal states that "analytical procedures generally do not involve evaluating individual items included in an account or disclosure." However, we think that analytical procedures could, in certain circumstances, involve evaluating individual items included in an account or disclosure because the use of technology enables the auditor to design and perform analytical procedures by understanding plausible relationships among data and developing related expectations at the individual item level. Auditors would likely look to the nature of the procedure (i.e., the analysis of plausible relationships among data compared with other more direct audit procedures) in determining whether an audit procedure is a TOD or SAP.



Accordingly, we propose the following update to AS 1105.13:

.13 Audit procedures can be classified into the following categories:

- a. Risk assessment procedures, [FN 6 excluded] and*
- b. Further audit procedures, [FN 7 excluded] which consist of:*
 - (1) Tests of controls, and*
 - (2) Substantive procedures, including tests of details and substantive analytical procedures.*

*Note: A test of details involves performing audit procedures with respect to individual items included in an account or disclosure, ~~whereas analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts.~~[FN 7A]
[FN 7A] See also paragraph .21 of this standard.*

We also recommend updates to AS 1105.21, which would remove the discussion contrasting analytical procedures and TODs (consistent with our suggested edits to AS 1105.13) and specifically clarify that analytical procedures can involve developing expectations at an aggregate or individual item level (additions marked as underlined):

.21 Analytical procedures consist of evaluations of financial information made by an analysis of plausible relationships among both financial and nonfinancial data that can be external or company-produced. Analytical procedures may involve using data to develop expectations at an aggregate or individual item level. Analytical procedures also encompass the investigation of significant differences from expected amounts. ~~Unlike tests of details, analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts.~~[FN 11 excluded]

The nuances of classifying technology-assisted analysis as TODs and SAPs are challenging to work through without an interactive discussion. As noted above, the CAQ welcomes the opportunity to engage in further discussion with the PCAOB on this topic.

6. *Are the proposed requirements that specify the auditor's responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?*

We support the proposed amendments to AS 1105.14, which would require the auditor to design and perform an audit procedure to achieve each relevant objective established by the auditor. However, we believe it is important to acknowledge that procedures performed using technology-assisted analysis may provide the auditor with new insights and information that can be used to refine the auditor's expectations and procedures in real-time and may produce evidence related to audit objectives that may not have been originally contemplated, confirmatory or contradictory. For example, when using technology-assisted analysis to perform procedures on a population of revenue transactions, the auditor



may find that there is a sub-population of revenue transactions that exhibit different characteristics than the rest of the population. Using professional judgment, the auditor may determine that it is appropriate to modify the initially planned audit procedures to address these differing characteristics and achieve the relevant audit objective. As such, it would be helpful for the final standard to acknowledge that designing and performing audit procedures to achieve each relevant objective can be iterative in nature and that the purpose or intent of the procedure and expectations may evolve while executing the analysis and that this is appropriate given the proposed amendments to AS 1105.14.

Additionally, to provide additional guidance and promote consistency in practice, we suggest that the PCAOB include an example of audit evidence from an audit procedure that achieves more than one purpose, such as the example provided in AICPA AU-C 500 *Audit Evidence* Exhibit A.²

7. *Would the proposed amendments, that specify considerations for the auditor’s investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?*

We appreciate the PCAOB specifying what is expected regarding the investigation of items meeting criteria established by the auditor when designing or performing substantive procedures. However, the requirements proposed in AS 2301.37A may leave some open questions that could be clarified to help drive consistency in interpretation and execution. The points in 2301.37A (a) – (d) already exist in other PCAOB standards and we believe that firms are already contemplating these requirements.³ As such, we believe that the final standard could be enhanced by addressing the following topics related to the auditor’s investigation of items that meet criteria established by the auditor:

- A. Clarification that if an audit procedure that addresses 100% of the population using technology-assisted analysis returns items within the population that meet the criteria established by the auditor, it may be acceptable to sample those items if they have similar characteristics such that audit sampling can be expected to be representative of that population of items identified and the results can be projected to the population of items that meet the criteria established by the auditor. We believe that this is an acceptable approach and recommend that additional guidance be provided in AS 2301. Clarification on this point could give auditors confidence in using technology-assisted analysis to perform procedures over 100% of populations.
- B. Conversely, if the auditor properly designs a TOD involving technology-assisted analysis that addresses 100% of the population (and appropriately addresses the risk(s) of material

² [AICPA AU-C 500](#) paragraph A69

³ For example, when the auditor obtains evidence during the audit that contradicts the audit evidence on which the original risk assessment was based, AS 2110.74 requires the auditor to revise the risk assessment and modify the planned audit procedures or perform additional procedures in response to the revised risk assessment (see also AS 2301.46), which is consistent with the proposed amendments to paragraph .37A bullets a, b, and d. We also believe that bullet c of the proposed amendments to paragraph .37A is addressed through the requirements within AS 2201.08 and AS 2315.26.



misstatement) and returns no items that meet the criteria established by the auditor, then additional testing of the population would not be expected in accordance with the proposed amendments (assuming the auditor has determined that the information used in the analysis is sufficient and appropriate for purposes of the audit). Further, the requirements in AS 2301.37A would not be applicable as no items meeting the auditor's criteria for investigation were identified. While we believe that the requirements as currently proposed would indicate that the procedures performed are sufficient, additional guidance such as an example in the Release text or through specific requirements included in AS 2301 would be beneficial.

8. What other factors, if any, should the auditor consider when investigating items that meet criteria established by the auditor when designing or performing substantive procedures?

As described in our response to question 7, additional clarification to the amendments related to the investigation of items meeting criteria established by the auditor when designing or performing substantive procedures could be beneficial to provide clarity on key questions faced by auditors.

Additionally, page 22 of the Release provides examples for consideration when applying the proposed amendments to AS 2301.37A. The first example discusses how the auditor may apply the requirements when performing risk assessment procedures. It is our view that AS 2301.37A would be applicable when the auditor is investigating items that meet the criteria established for a substantive procedure, as the investigation of items identified in the performance of risk assessment procedures would be addressed through the requirements in AS 2110.74. Accordingly, we recommend that the revenue transaction example on page 22 of the Release be removed or updated.

The second example refers to groups of transactions where the risk of material misstatement may be assessed as higher or lower. This example introduces terminology that is not used in AS 2110, which focuses on the likelihood and magnitude of potential misstatements but does not introduce the concept of lower and higher risk of material misstatement. For consistency with existing PCAOB standards, it would be helpful for the wording of the example to align with AS 2110. It may also be helpful to include additional detail in the example to provide further clarity as to why the procedures performed to investigate the higher and lower risk transactions are appropriate.

9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

We appreciate the guidance in AS 1105.10A to provide additional clarity regarding the auditor's responsibility for external information maintained by the company in electronic form. The Board's consideration of the following further clarifications would be helpful.

In proposed AS 1105.10A the phrase "maintained *in its information systems* in electronic form [emphasis added]" is included. We interpret the term "information systems" in AS 1105.10A to be consistent with AS 2110.28, which focuses on information systems that are relevant to financial reporting. We believe



that this is an important clarification because external information maintained by the company in its information systems in electronic form (for example, information regarding purchase orders from suppliers) would typically be subject to information technology general controls, whereas a PDF bank statement downloaded by an employee and maintained on their local computer may not be subject to the same or similar information technology general controls. As such, it would be beneficial for the PCAOB to include an example in the Release to clarify that this interpretation is accurate.

Additionally, we are not sure what is meant by AS 1105.10A(b) which states that the auditor can “test the company’s procedures discussed in subpart (a) of this paragraph.” The phrase “test the company’s procedures” is not used elsewhere in the PCAOB auditing standards and it is not clear to us what is meant by testing the company’s procedures compared with testing the company’s controls.

We note that AS 1105.10 permits the auditor to perform procedures to directly test the accuracy and completeness of information produced by the company. AS 2305.16 also permits the auditor to test controls or perform other procedures to support the completeness and accuracy of the underlying information used in SAPs. It does not appear that this option to perform other procedures to evaluate the reliability of external information maintained by the company in its information systems in electronic form is included in AS 1105.10A. We ask the Board to consider providing additional clarity stating that it would be appropriate for the auditor to directly perform procedures to evaluate the reliability of such information in AS 1105.10A. This is important because potential audit scope limitations could arise in instances where controls are not effective or the company’s controls are not designed at a precise enough level for the auditor to rely on certain data elements, and the company does not perform other procedures over the information. In these circumstances, while management’s controls may be appropriate for management’s purposes, the auditor does not appear to have another method to test the underlying information for reliability. We believe that it should still be possible for the auditor to independently gather audit evidence that the information is reliable.

Further, the requirements in AS 1105.10A(b) seem to imply that it would be mandatory for the auditor to test information technology general controls and automated application controls in all circumstances (when the auditor chooses to test controls). The external information may also be subject to manual controls that, if operating effectively, could provide sufficient appropriate audit evidence about the reliability of external information maintained by the company in its information systems electronic form, and further testing of information technology general controls and automated application controls would not be necessary. Additionally, a requirement to test information technology general controls and automated application controls in all circumstances appears inconsistent with the requirements in AS 2201 *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*, which links the extent of the auditor’s control testing procedures to the auditor’s risk assessment.⁴ AS 1105.10A(b) appears to remove considerations of the auditor’s risk assessment and judgment in determining the extent of control testing required.

⁴ AS 2201.41 states that “[t]he decision as to whether a control should be selected for testing depends on which controls, individually or in combination, sufficiently address the assessed risk of misstatement to a given relevant



Finally, we recommend that the examples of external information maintained by the company in its information systems in electronic form included in footnote 3B to AS 1105.10A be updated to provide greater clarity for auditors. The example states “information regarding ... cash received by the company from a customer as payment for an invoice,” however it is not clear if this is referring to cash receipts data where the cash has been applied to customer invoices in the company’s ERP system, the electronic data files received from the bank from the lockbox with cash receipt information, wire transfer information, information received through an EDI feed, or something else.

To address our concerns noted above and also to enhance scalability of the standard, we suggest AS 1105.10A be updated as follows (additions marked as underlined):

***.10A** The company may provide to the auditor information that the company received from one or more external sources and maintained in its information systems in electronic form.[FN 3B excluded] When using such information as audit evidence, the auditor should evaluate whether the information is reliable for purposes of the audit by performing procedures to:*

- a. Obtain an understanding of the source of the information and, where necessary, the company’s procedures ~~by which over~~ such information is received, recorded, maintained, and processed in the company’s information systems, and*
- b. Test controls ~~(including information technology general controls and automated application controls)~~ over the company’s procedures discussed in subpart (a) of this paragraph or otherwise obtain evidence about the reliability of the information ~~test the company’s procedures discussed in subpart (a) of this paragraph.~~*

10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

While we are supportive of emphasizing the importance of controls through the proposed updates to AS 1105.08 and AS 1105.15, we have concerns related to proposed amendments that appear to require the testing of controls (including information technology general controls and automated application controls). Specifically, we believe that the proposed amendments to AS 1105.15 could imply that the auditor cannot perform procedures to establish the reliability of information if the controls are found to be ineffective. As the proposed amendments to AS 1105.15 related to the reliability of information parallel the concepts in AS 1105.08, we recommend the following updates to paragraph AS 1105.15 to mirror the language in AS 1105.08 (additions marked as underlined):

***.15** Inspection involves examining information, whether internal or external, in paper form, electronic form, or other media, or physically examining an asset. Inspection of information provides audit*

assertion rather than on how the control is labeled (e.g., entity-level control, transaction-level control, control activity, monitoring control, preventive control, detective control).”



evidence of varying degrees of reliability, depending on its nature and source.[Footnote 7C excluded] In addition, ~~the reliability of information produced by the company, or external information maintained by the company~~ in electronic form, is generally considered more reliable when the company's controls over that information including, where applicable, its information technology general controls and automated application controls, are effective, ~~also depends on the effectiveness of the controls over that information, including, where applicable, information technology general controls and automated application controls.~~[Footnote 7D excluded] An example of inspection used as a test of controls is inspection of records for evidence of authorization.

Additionally, as it relates to AS 1105.08, we believe that the discussion regarding “original documents” could be further modernized to better reflect that some information and documents may only exist in electronic form (as opposed to the electronic form of the document being a copy of the original) or, in many cases, the execution of a transaction is not in the form of a document at all. For example, when a transaction is initiated in a company’s ERP system through an electronic data transmission directly from a customer, no physical or original document exists evidencing the initiation of the transaction by the customer and the traditional notion of an “original document” doesn’t fit the way the transaction is originated and executed. In such cases, evaluating other evidence including the effectiveness of controls, the customer order history, the billing and subsequent settlement of accounts receivable with the customer, the delivery and acceptance history, the customer’s return/rejection history, and/or credit notes may be more appropriate individually or in combination to establish the reliability of the customer-initiated transactions. While we suggest modernizing the language, we agree that it is important for AS 1105.08 to continue to address the concept that information that has been modified from its original form (whether that is hard copy or electronic form) may give rise to additional risks about the reliability of the information.

As such, we recommend that AS 1105.08 be updated as follows (additions marked as underlined):

***.08 Reliability.** The reliability of evidence depends on the nature and source of the evidence and the circumstances under which it is obtained. In general:*

- *Evidence obtained from a knowledgeable source that is independent of the company is more reliable than evidence obtained only from internal company sources.
Note: See Appendix A of this standard for requirements related to the evaluation of evidence from a company’s specialist.*
- *Information in electronic form, including information produced by the company and external information maintained by the company in electronic form, is generally considered ~~are~~ more reliable when the company’s controls over that information including, where applicable, its information technology general controls and automated application controls, are effective.*
- *Evidence obtained directly by the auditor is more reliable than evidence obtained indirectly.*



- *Evidence provided ~~by~~ in its original form documents (whether in hard copy or electronic form) is generally considered more reliable than evidence ~~provided by that has~~ undergone conversion, copying, or other modifications from its original form, photocopies or facsimiles, or documents that have been filmed, digitized, or otherwise converted into electronic form, ~~€~~The reliability of information that has been converted, copied or otherwise modified from its original form ~~which depends on the controls over the conversion and maintenance of that information~~ those documents.*

Note: If a third party provides evidence to an auditor subject to restrictions, limitations, or disclaimers, the auditor should evaluate the effect of the restrictions, limitations, or disclaimers on the reliability of that evidence.

11. *When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?*

We do not believe that PCAOB standards should require internal controls over information produced by the company and external information maintained by the company in its information systems in electronic form to be effective for such information to be considered reliable audit evidence. In certain circumstances, internal controls over such information may not be effective or may be outside the scope of the company's internal controls over financial reporting (in accordance with the Sarbanes-Oxley Act (SOX) Section 404) but the auditor may still be able to conclude that the information is reliable based on the performance of other audit procedures, such as directly testing the completeness and accuracy of the information.

12. *Are the proposed amendments that update certain terminology in AS 1105 clear and appropriate? If not, what changes should be made?*

Our feedback on terminology has been included in our responses to questions 4, 9, and 10.

20. *Are any of the alternative approaches, or any other approaches, preferable to the approaches that are being proposed to address audit procedures that involve technology-assisted analysis? If so, what are they and what reasons support one or more alternative approaches over the proposed approaches?*

As we describe in our introductory remarks, we encourage the Board to potentially think broader about technology, the audit, and audit quality. We believe that there is a future opportunity for the PCAOB standards to focus on the sufficiency and appropriateness of audit evidence obtained from audit procedures rather than the classification of audit procedures. As technology-assisted analysis evolves over time, it may continue to become more difficult to fit new analyses into specific classifications.



23. How much time following SEC approval would audit firms need to implement the proposed requirements?

In establishing the effective date, it is important for the PCAOB to take a holistic view of all new and revised PCAOB auditing standards that will become effective in the coming years. We especially believe the multitude of changing standards will significantly impact smaller firms, who will need ample time to evaluate and implement new standards. In addition, firms of all sizes will need time to evaluate and implement changes to firm methodologies, training, and tools.

It is also important for the PCAOB to consider that the new requirements of this proposal could indirectly impact issuers, especially if they need to implement or formalize controls or processes around external information (based on the requirements in AS 1105.10A). As a result, if the requirements in AS 1105.10A remain as proposed, we recommend that an additional year of implementation time after the year of approval by the SEC may be needed.

24. Would requiring compliance for fiscal years beginning after the year of SEC approval present challenges for auditors? If so, what are those challenges, and how should they be addressed?

We believe that requiring compliance for fiscal years beginning after the year of SEC approval may present challenges for auditors. Updating training and firm methodology will take time not just for this proposal but for what is anticipated to be many new or amended auditing standards in the near or medium term. As such, assuming SEC approval occurs during 2024, we recommend the final standard be effective no earlier than for audits with fiscal years beginning on or after December 15, 2025.

CAQ

The CAQ appreciates the opportunity to comment on the technology-assisted analysis proposal, and we look forward to future engagement. As the Board gathers feedback from other interested parties, we would be pleased to discuss our comments or answer questions from the Board regarding the views expressed in this letter. Please address questions to Vanessa Teitelbaum (vteitelbaum@thecaq.org) or Erin Cromwell (ecromwell@thecaq.org).

Sincerely,



Vanessa Teitelbaum, CPA
Senior Director, Professional Practice
Center for Audit Quality

cc:

PCAOB

Erica Y. Williams, Chair
Duane M. DesParte, Board member
Christina Ho, Board member
Kara M. Stein, Board member
Anthony C. Thompson, Board member
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Crowe LLP
Independent Member Crowe Global

August 28, 2023

By email: comments@pcaobus.org

Ms. Phoebe W. Brown
Office of the Secretary
PCAOB
1666 K Street NW
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Re: PCAOB Rulemaking Docket Matter No. 052: *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (PCAOB Release No. 2023-004)

Dear Ms. Brown:

Crowe LLP appreciates the opportunity to comment on the Public Company Accounting Oversight Board's (PCAOB or "the Board") proposed amendments to Auditing Standard (AS) 1105, *Audit Evidence*, AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and related conforming amendments.

General Observations

We support the PCAOB's efforts to modernize its standards by specifically addressing aspects of designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools (i.e., technology-assisted analysis). Technology-assisted analysis presents opportunities to design and execute more efficient and effective audit procedures and has the potential to increase audit quality. It is important for the PCAOB's auditing standards to provide clear requirements and guidance to auditors that support the use of technology in a manner that enhances audit quality. Generally, we believe these proposed amendments will achieve that outcome.

We commend the PCAOB on the outreach performed to date related to technology, including with the Data and Technology Task Force. As technology-assisted analysis continues to evolve and more data becomes available in electronic form, there will likely be a need for further changes to existing standards. It will be important, however, for the PCAOB standards to be scalable to both the range of audit firms using the standards and the issuers and broker-dealers that they audit and be applicable to a variety of technologies. As such, we strongly encourage the PCAOB to continue to engage with the audit profession, issuers and others to understand how auditors are using technology in their audits. In particular, it will be important for the PCAOB to understand how firms of different sizes are incorporating technology-assisted analysis into their audits so the standards continue to be applicable to all PCAOB-registered firms.

Specific Areas of Comment

Evaluating the Sufficiency and Appropriateness of Audit Evidence

As noted in the release, "...technology-assisted analysis could be used in a variety of audit procedures, including risk assessment and further audit procedures [and] an audit procedure that involves technology-assisted analysis may provide audit evidence for more than one purpose..." The proposed amendments, however, maintain the distinction between risk assessment procedures, tests of details, and substantive analytical procedures. We recognize that the proposed amendments are focused on providing clarity regarding the use of technology-assisted analysis within the existing framework in the PCAOB standards; however, we believe there is an opportunity for the PCAOB to strengthen its standards by focusing on the audit evidence provided.

Given that technology-assisted analysis may be classified as more than one type of audit procedure and can provide evidence for more than one purpose, we believe it is necessary for the auditing standards to evolve to guide auditors in evaluating the sufficiency and appropriateness of audit evidence obtained. The classification of an audit procedure as a risk assessment, test of detail or analytical procedure should be of less importance compared to the audit evidence provided by the procedures being performed. This change in the focus of the standards would further promote the auditor's evaluation of whether the evidence obtained is sufficient and appropriate to support the opinion(s) being issued.

Additionally, as technology allows auditors to perform procedures at increasingly detailed levels or new technology-assisted procedures are developed, it may become increasingly difficult to specify the type of procedure being performed. By focusing the standards on obtaining sufficient appropriate audit evidence and providing guidance on how to evaluate the evidence that a procedure provides, the standards can support high quality audits and be adaptable for future evolutions in technology.

Description of Test of Details and Analytical Procedures

Notwithstanding the comment above, we agree with the Board's proposed description of tests of details in AS 1105.13 as performing procedures with respect to individual items included in an account or disclosure. We do not, however, believe it is accurate to contrast analytical procedures with a test of details as proposed in AS 1105.13 and .21:

...analytical procedures generally do not involve evaluating individual items included in an account or disclosure...

Technology-assisted analysis allows the auditor to develop expectations at increasing precise levels, such that the auditor may be able to evaluate "individual" items when performing a procedure that has generally been classified as an analytical procedure. As noted in our comment above, it will become more difficult to classify an audit procedure as an analytical procedure or a test of details as technology develops and the nature of procedures the auditor is able to perform changes. Including this description of an analytical procedure in the standard may add to the confusion as to the type of procedure being performed and discourage auditors from performing technology-assisted analysis that appear to be both a test of details and an analytical procedure. We recommend, therefore, that the Board remove this added description of an analytical procedure from AS 1105.13 and .21.

Investigating Specific Items

We agree that the auditor's appropriate investigation of identified items is important both for identifying and assessing the risks of material misstatement and for designing and implementing appropriate responses to the identified risks. We are concerned, however, that as drafted, the proposed amendment to AS 2301.37A may result in the auditor investigating an extensive number of items that do not reasonably represent a risk of material misstatement to the financial statements.

As the release notes, when using technology-assisted analysis, the auditor may identify hundreds of items as meeting specified criteria. While the amendments would “specify considerations for the auditor’s investigation of items that meet criteria...,” it is not clear as to whether the auditor would be expected to perform testing (i.e., further investigation) on each of the items meeting specified criteria. We believe it is important that the amendments allow the auditor to apply judgment in selecting items for further investigation. Without this clarification, auditors may perform extensive testing of items that do not represent a risk of material misstatement. In addition to taking into consideration the criteria proposed in AS 2301.37A, the standard should clearly state that the auditor can use one or a combination of means to select items for further investigation. For example, depending on the characteristics of the identified items, the auditor may be able to select a representative sample and project the results to the entire population of identified items. Alternatively, the auditor may select a sample of items to test based on risk-based criteria such that the remaining items do not reasonably represent a risk of material misstatement to the financial statements. Adding this clarification to the standard is important to give auditors guidance in designing and implementing technology-assisted analysis that performs procedures over 100% of populations.

Evaluating the Reliability of External Information

The release notes that the proposed amendments are designed to address the risk that the external information maintained by the company and provided to the auditor to be used as audit evidence may be incomplete or inaccurate. To accomplish this, the proposal would include the following as paragraph 10A to AS 1105:

The company may provide to the auditor information that the company received from one or more external sources and maintained in its information systems in electronic form.^{3B} When using such information as audit evidence, the auditor should evaluate whether the information is reliable for purposes of the audit by performing procedures to:

- a. Obtain an understanding of the source of the information and the company’s procedures by which such information is received, recorded, maintained, and processed in the company’s information systems, and
- b. Test controls (including information technology general controls and automated application controls) over the company’s procedures discussed in subpart (a) of this paragraph or test the company’s procedures discussed in subpart (a) of this paragraph.

^{3B} For example, information regarding a purchase order submitted to the company by a customer or regarding cash received by the company from a customer as payment for an invoice.

It is important for the auditor to assess the reliability of information used in its audit procedures so that the auditor is obtaining relevant and reliable evidence on which to base the opinion(s). While we are supportive of emphasizing the importance of assessing the reliability of external information, we have several concerns about the proposed requirements in AS 1105.10A.

Firstly, we have concerns that the amendments appear to require the testing of controls (including information technology general controls and automated application controls). We do not believe that the proposed requirements provide the auditor with sufficient flexibility to design a risk-based audit that is appropriate for the specific issuer’s facts and circumstances. Specifically, proposed AS 1105.10A directs the auditor to “test controls (including information technology general controls and automated application controls) over the company’s procedures...” This approach appears to be a departure from how the auditor evaluates the completeness and accuracy of information pursuant to AS 1105.10 which allows the auditor to either directly test the accuracy and completeness of the information or test the controls over the accuracy and completeness of that information. We believe it is important for proposed AS 1105.10A

to provide the auditor with the ability to perform procedures to directly evaluate the reliability of external information maintained by the company in its information systems in electronic form as there may be instances where the auditor is unable to test controls, including information technology general controls, or controls are ineffective.

We also noted the proposed amendments in AS 1105.08 and 1105.10 include the phrase “where applicable” in relation to testing information technology general controls and automated application controls. This phrase is not included, however, in proposed AS 1105.10A. As described above, there may be instances in which the auditor cannot test controls over the reliability of external information. It is also not clear whether “automated application controls” would be in place over the reliability of external information in all instances, or that testing those controls would be the most effective audit approach. As such, we recommend the Board include the phrase “where applicable” in AS 1105.10A to acknowledge that testing information technology general controls and automated application controls may not be relevant in all audits:

- b. Test controls (including, where applicable, information technology general controls and automated application controls) over the company’s procedures...

Additionally, we noted the references to “the company’s procedures” and a requirement to test those procedures in proposed AS 1105.10A. As this phrase is not used elsewhere in the PCAOB standards, it is not clear what the Board intends for the auditor to test (as compared to management’s controls). This phrase also appears to create a different focus from the approach in other paragraphs of AS 1105. Rather than directing the auditor to assess the reliability of the external information (whether by testing the reliability of the external information directly or testing controls over it), the auditor’s attention is being directed at management’s processes or controls. We believe the requirements in AS 1105 should clearly and directly address testing the reliability of external information, rather than achieving that outcome through reference to the company’s procedures.

We noted proposed AS 1105.10A includes the phrase “...maintained in its information systems in electronic form.” We recommend the Board clarify that the term “information systems” in proposed AS 1105.10A is consistent with paragraph 28 of AS 2110, *Identifying and Assessing Risks of Material Misstatement* (i.e., information systems relevant to financial reporting). We believe this clarification would be useful when considering controls, including information technology general controls, that operate with respect to the external information.

Finally, we recommend that the amendments provide clear examples of external information maintained by the company in its information systems in electronic form as guidance for auditors. For example, proposed footnote 3B to AS 1105.10A provides an example of “information...regarding cash received by the company from a customer as payment for an invoice.” A company, however, may have information regarding cash receipts in the company’s ERP system, in downloaded wire transfer information, received through an EDI feed, as a few examples. It is important for the standard to provide a clear explanation for external information maintained by the company in its information systems in electronic form so that the auditor can develop a sufficient audit approach.

Requiring Test of Details to Respond to a Significant Risk

As noted in the release, existing PCAOB standards require the auditor to perform tests of details that are specifically responsive to significant risks, including fraud risks. As technology-assisted analysis become more prevalent and can be performed at increasing levels of precision, we encourage the Board to reconsider the presumption that it is unlikely that audit evidence obtained from substantive analytical procedures alone will be sufficient to respond to significant risks. We believe that the use of technology-assisted analysis may provide the auditor with sufficient and appropriate audit evidence to address significant risks and may enhance the auditor’s procedures to detect fraud.

Effective Date

We noted the PCAOB proposed that auditors would need to adopt the amendments for audits of fiscal years ending on or after June 30th of the year after SEC approval. As this could be as little as six months, we are concerned about the ability to effectively implement the proposed amendments in that short of a timeframe. Implementing the amendments will include updating methodology and related tools and developing and conducting training for the entire audit practice. In order to allow sufficient time to implement the new standard thoroughly and thoughtfully, we encourage the PCAOB to allow for at least 12 months for implementation.

We also strongly encourage the Board to take a holistic view of the standard-setting activity when evaluating an effective date. Firms will need time to evaluate and implement changes to methodologies, training, and tools for each standard that the Board adopts; to the extent there are multiple standards being implementing concurrently, firms will need to devote substantial resources to those efforts. Allowing sufficient time for the implementation period of each new standards will support firm's abilities to effectively implement the new standards.

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We appreciate the opportunity to share our perspectives on the Board's proposed amendments. We would be pleased to discuss our comments with the Board or its staff. If you have any questions, please contact Matthew Schell or Kyle Owens.

Sincerely,

A handwritten signature in black ink that reads "Crowe LLP". The letters are cursive and somewhat stylized.

Crowe LLP

**Deloitte & Touche LLP**

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August 28, 2023

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street, NW
Washington, DC 20006-2803

Re: PCAOB Rulemaking Docket Matter No. 052

Deloitte & Touche LLP (“D&T,” “we,” or “our”) appreciates the opportunity to respond to the request for comments from the Public Company Accounting Oversight Board (the “PCAOB” or the “Board”) on PCAOB Release No. 2023-004, *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (the “proposed amendments”).

Overview

The availability of electronic information both internal and external to the company being audited is increasing and the auditor’s use of technology-assisted analysis on that information as part of the audits of the company’s financial statements and internal control over financial reporting, where applicable, continues to evolve. We are supportive of the Board’s strategic plan to modernize the auditing standards, including addressing aspects of designing and performing audit procedures that involve technology-assisted analysis in audits and taking this initial step to begin creating a comprehensive framework addressing appropriate use of technology on the audit. To that end, we recommend that, as the Board is modernizing its standards, it continues to consider the continual evolution of technology that will occur over time. We believe that the requirements in the standards should not be overly prescriptive or contain examples that may become outdated as technology continues to evolve. Examples can, however, provide helpful context to the requirements and how they are expected to be applied. For that reason, we encourage the Board to include examples in the accompanying release, or in staff guidance that can be updated as needed.

Overall, we are supportive of the proposed amendments to PCAOB Auditing Standards (“AS”) 1105, *Audit Evidence* (“AS 1105”), and AS 2301, *The Auditor’s Responses to the Risks of Material Misstatement* (“AS 2301”); however, we believe certain clarifications may be useful to avoid misinterpretation and support consistent understanding and application. In those respects, we have the following recommendations.

Classification of Audit Procedures

We appreciate the Board’s effort to describe a test of details, however, the determination or classification of the type of audit procedure may become increasingly challenging as the use of technology-assisted analysis may result in procedures that do not clearly fall into a single type of audit procedure. Although a test of details generally involves performing audit procedures with respect to individual items, with technology-assisted analysis we believe that there may also be audit procedures “performed on individual items” as part of analytical procedures, including substantive analytical procedures. For example:

- The auditor develops a visualization of the distribution of revenue transactions at a detailed level to identify outliers within the population. Even though the auditor is using transaction-level data (i.e., individual items), the analysis is an analytical procedure (as described in existing AS 1105, paragraph .21) used by the auditor to support risk assessment conclusions and is not designed to be a test of details.
- The auditor tests loan repayments by developing an expectation of the recorded amounts for individual loans (i.e., individual items) within a population. The auditor develops an expectation using monthly interest rates (as opposed to daily interest rates used by the company to record the balance). The auditor considers the procedure a substantive analytical procedure as opposed to a test of details, because the expectation is not a precise recalculation, and the auditor uses the individual loan data to develop an expectation in the aggregate for comparison to the recorded amount.

In all cases, we think that the auditor’s determination of how to classify a particular procedure is less important than the assessment of whether sufficient and appropriate audit evidence has been obtained (either to support risk assessment, or to provide the basis as to whether risks have been reduced to an acceptably low level).

Given the examples above, we suggest the Board make the following revisions to AS 1105, paragraph .13 and make conforming amendments to AS 1105, paragraph .21:

Note: A test of details involves performing audit procedures with respect to individual items included in an account or disclosure, ~~whereas analytical~~ **Analytical** procedures generally do not involve evaluating individual items included in an account or disclosure. **However, there may be circumstances in which expectations for analytical procedures are developed at the individual item level or unless when** those items are part of the auditor’s investigation of significant differences from expected amounts.

We also recommend that within the release that will accompany the final standard the Board include examples of analytical procedures designed at an individual item level (similar to the two examples above) in order to provide additional clarity regarding the application of the description within AS 1105, paragraphs .13 and .21.

In addition, we are supportive of the proposed amendments to AS 1105, paragraph .14 that clarify that the auditor can use evidence obtained from an audit procedure for more than one purpose. We suggest that the Board also clarify that the specific audit procedures referenced in paragraph .14 are not an all-inclusive list, to allow for additional types of procedures that might be used in the future with the advancement of technology-assisted analysis.

External Information Maintained by the Company in Its Information Systems

We agree with the Board’s proposal to clarify the auditor’s responsibilities to evaluate external information maintained by management in its information systems in electronic form. However, as further described below, aspects of the proposed amendments in AS 1105 risk being inconsistently applied and would appear to limit the procedures that may be performed by the auditor to evaluate the reliability of external information.

While we are supportive of the Board’s efforts to emphasize the importance of controls over information used as audit evidence, we do not believe that testing information technology general controls (ITGCs) and automated application controls should be required in all cases, except when substantive procedures alone cannot provide sufficient appropriate audit evidence as described in AS 2301, paragraph .17. For example, in instances in which there are no ITGCs or automated application controls over the information in the company’s information system, a company may have effective manual controls in place to address the accuracy and completeness of the information (e.g., controls that reconcile the information back to the original external source).

In addition, it is unclear what is intended by the proposed amendment to “test the company’s procedures,” and how it would differ from testing the company’s controls. In instances in which controls are not present or are

ineffective, and the company does not perform procedures over the information, we believe auditors may nevertheless obtain evidence over the reliability of information independent of the company's controls or procedures (i.e., by testing the accuracy and completeness of the information, consistent with the requirements in AS 1105, paragraph .10). As drafted, the proposed requirement would appear to preclude this alternative.

For example, in preparing the financial statements, the company uses mortality tables obtained from an external source. The mortality tables are manually input into the company's information system in electronic format by company personnel. Once in the company's information system, there are no controls or other procedures performed by the company to maintain or protect the information from being modified. The auditor uses these mortality tables in performing audit procedures.

The auditor would not be able to apply AS 1105, paragraph .10A to test the reliability of the mortality tables, as (1) management does not have controls over the information in the company's information system and (2) the company does not perform any procedures over the information.

We believe that the auditor can obtain sufficient appropriate audit evidence that the mortality tables are reliable by obtaining evidence independent of management. The auditor may substantively test the reliability of the information by obtaining the tables directly from the external source. Provided that the auditor is satisfied as to the relevance and reliability of the external source, the auditor would agree the independently obtained information to the tables used by the company. If provided this alternative, even though the controls are not effective, the auditor may still nevertheless be able to obtain sufficient appropriate audit evidence that the data used by management is reliable. The auditor would also separately identify and evaluate deficiencies in the company's internal control.

We suggest the following revisions to AS 1105, paragraph .10A(b) to (1) clarify testing controls in paragraph .10A(b) may include ITGCs and automated application controls "where applicable," but testing such controls would not be required in all cases and (2) replace "test the company's procedures" with "test the completeness and accuracy of information." While it is important to recognize that the auditor may not be able to evaluate the completeness and accuracy of information obtained from an external source to the same degree as the auditor would evaluate the completeness and accuracy of internal information obtained from management, this edit would allow auditors the option of evaluating the reliability of information used in the audit, independent of processes and controls at the company:

- .10A(b) Test controls (including, where applicable, information technology general controls and automated application controls) over the company's procedures discussed in subpart (a) of this paragraph or test the accuracy and completeness of the information ~~test the company's procedures discussed in subpart (a) of this paragraph.~~

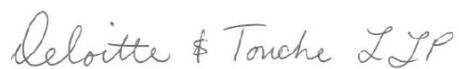
Note: Procedures regarding the reliability of information that the company received from external sources may depend on the nature and source of the information, as well as how the external information will be used in the execution of an audit procedure. The auditor may not be able to evaluate the completeness and accuracy of information obtained from an external source to the same degree as the auditor would evaluate the completeness and accuracy of internal information obtained from the company.

In addition, in the proposed amendments to footnote 3B of AS 1105, the Board includes an example of information regarding cash received from customers as external information maintained by the company in its information systems in electronic form. We suggest the Board provide clarity on why this is an appropriate example of third-party information maintained electronically in the company's information systems. It is unclear whether the Board

intends that this example includes information regarding cash received from bank statements in electronic form (e.g., PDF), as we do not believe bank statements would typically be considered information maintained in the company's information systems. We also recommend the Board include additional, commonly used examples in the release that will accompany the final standard, in order to provide examples of external information used by management and maintained in its information systems (e.g., foreign currency exchange rates).

We would welcome the opportunity to engage with the Board in dialogue about our comments to provide additional context about impacts and implications. If you have any questions, please contact Jennifer Haskell at 203-761-3394 or Dora Burzenski at 206-716-7881.

Yours sincerely,

A handwritten signature in cursive script that reads "Deloitte & Touche LLP".

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Ms. Phoebe W. Brown
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28 August 2023

Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Dear Ms. Brown:

Ernst & Young LLP welcomes the opportunity to offer its views on the Public Company Accounting Oversight Board (PCAOB or Board) proposal to amend Auditing Standard (AS) 1105, *Audit Evidence*, and AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and make conforming amendments.

We support the Board's efforts to modernize the standards related to the auditor's use of technology-assisted analysis (also known as data analytics). As the Board noted in the proposing release, the use of technology by the auditors to perform audit procedures has significantly increased since 2010 when the PCAOB adopted AS 1105 and AS 2301. This trend will likely accelerate as the use of technology, including emerging technologies, expands and financial statement users expect the auditors to use data and technology to more effectively and efficiently obtain audit evidence. Updating the standards to include considerations and principles that are flexible to support the rapid pace of change is essential to maintaining audit quality.

We believe that technology-assisted analysis, when designed and executed appropriately, enhances the effectiveness of audit procedures in all phases of the audit, and the need for new technology-assisted procedures is increasing as issuers incorporate the use of highly automated IT applications and emerging technologies into their accounting processes. Auditors can and should use the available comprehensive, detailed and disaggregated data to more accurately identify risks of material misstatement, understand the flow of data through a company's financial reporting processes, and design and execute audit procedures to more precisely address identified risks.

We generally support the PCAOB's proposed guidance to address the increasing use of technology-assisted analysis. However, we discuss below certain changes and clarifications to the proposal that we believe would help the auditor more confidently perform data analytics and improve the relevance and quality of the assurance provided to investors and other users of a company's financial statements.

We encourage the Board to make the following adjustments in the final amendments.



Specifying the difference between substantive analytical procedures and tests of detail

We recommend that any new guidance focus on whether a procedure is designed appropriately to address the identified risks and whether it provides sufficient appropriate audit evidence rather than focusing on the differences between a substantive analytical procedure (SAP) and a test of details.

Given the evolution of technology-assisted analysis, it will become increasingly challenging to categorize new procedures. Further, these procedures may provide sufficient and appropriate audit evidence but do not meet the proposed definitions. For example, a regression model can be used to compare variables of individual revenue transactions posted throughout the year to identify outliers outside of the confidence bounds for further investigation. In another example, the expected revenue for all individual lease contracts may be re-calculated using certain terms extracted from the contracts and other assumptions using auditor judgment (e.g., monthly interest rate). The techniques in these examples could be classified either as a test of details, since they are performed at the “individual item” level, or as a SAP, which identifies and investigates outliers outside of the expected range.

If the proposed amendments to paragraphs .13 and .21 of AS 1105 are made, we recommend the following:

1. Clarifying the type of data or level of disaggregation intended by the term “individual items.” The proposed definition could be misinterpreted due to the varying forms of data obtained for analysis by the auditor. For example, individual items related to the revenue of a retail company may be interpreted as individual sales by a customer at the point-of-sale, individual entries made to the subledger by store or by day, or individual journal entries posting daily aggregated sales from the subledger to the general ledger. Each of the transactions tested in these examples could be considered “individual items” rather than SAPs performed using aggregated sales (e.g., by month or product line).

We recommend amending the proposed note at AS 1105.13(b)(2) to include considerations that the auditor may use to define the appropriate level of “individual item” for the procedure being performed, consistent with AS 1105.22-27. These considerations could include the objective of the audit procedure, the nature of the audit procedure to be applied and the evidence necessary to meet the objective of the audit procedure.

2. Clarifying that SAPs may also be performed at the individual item level. As illustrated in the examples above, SAPs may be designed with expectations at the individual item level (e.g., individual lease contract) but may not be considered to be a test of details. The current proposed language implies that such situations may be rare, but the availability of disaggregated data has increased the use of such procedures. Therefore, we recommend making the following edits to the note in the proposed amendments to AS 1105.13:

Note: A test of details involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor’s investigation of significant differences from expected amounts [FN 7A excluded].



We also suggest making the following conforming edits to the proposed amendments to AS 1105.21:

~~.21 Analytical procedures consist of evaluations of financial information made by an analysis of plausible relationships among both financial and nonfinancial data that can be external or company-produced. The plausible relationships may be evaluated at different levels of disaggregation to provide the desired level of assurance [FN X]. Analytical procedures also encompass the investigation of significant differences from expected amounts. ~~Unlike tests of details, analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts.~~[FN 11 excluded]~~

FN X: Automated tools and techniques may enable the auditor to set expectations of the plausible relationship at a more disaggregated level, such as at the individual item level.

Reliability of information provided by the company

The proposed requirements in AS 1105.10A blur the definition of external information received and maintained by the company and information produced by the company and have the potential to confuse auditors designing procedures to test each type of information. AS 1105.08 describes the evidence obtained from external sources as more reliable than evidence obtained from internal sources, which is why designing procedures to obtain and test the reliability of such information is important. After external information has been received, it is often recorded into the company's information system where it is moved, processed and changed to the point where it is no longer considered external information but rather information produced by the company and subject to transactional processes and controls. We believe it is important to clarify the difference between the two types of information and the expectations of auditors to test the reliability of both sources of information.

For example, AS 1105.10 requires auditors to test the accuracy and completeness of information produced by the company. However, testing the accuracy of external information received by the company may be difficult because the information originates from a third party. Instead, the auditor would likely focus on the evaluation of the completeness of the data obtained or the source and nature of the information as described in recent PCAOB Staff guidance¹. Additional procedures to test how the data is maintained and protected from unauthorized changes is also important so that the auditor can rely on the information as external evidence.

Refer to our response to question 9 in the Appendix for recommendations to clarify the proposed requirements of AS 1105.10A.

Investigating items identified by technology-assisted analyses

We agree that the standards should be modified to address the auditor's responsibilities when technology-assisted analyses return a high number of items for investigation. As a result of the improved coverage of the procedure, it is becoming more common for auditors to identify a larger

¹ *Staff Guidance – Insight for Auditors: Evaluating Relevance and Reliability of Audit Evidence Obtained From External Sources*, October 2021



number of items that do not initially meet their expectations. The considerations proposed as the new paragraph AS 2301.37A are a helpful start, but additional guidance is needed to help auditors respond appropriately to the identified items that may or may not result in a material misstatement or deficiency. We suggest incorporating elements of the International Auditing and Assurance Standards Board's recent Technology Frequently Asked Questions (February 2023) to enhance these considerations, such as:

- ▶ The ability for the auditor to perform further testing on a portion of identified items when there is a reasonable basis on which to draw conclusions about the population or sub-population of identified items. The discussion of the PCAOB's proposed amendment contains an example of an auditor taking a risk-based approach to the analysis of raw material purchases by testing all items for which the risk of material misstatement was assessed as higher and only certain items for which the risk was assessed as lower. We suggest incorporating this concept or example into the standard itself.
- ▶ The extent of testing expected, if any, over the population of items that are not indicative of a material misstatement or control deficiency. We believe that technology-assisted analyses can provide evidence about the items that fall within our financial or non-financial criteria (i.e., do not represent a risk of material misstatement or control deficiency) because those items have been subjected to a procedure to determine that they are less likely to be materially misstated. Because these items have been tested and found not to represent a risk of material misstatement, we believe the proposed requirements in AS 2301.37A would not be applicable. This concept is similar to the "scanning" procedure described in the American Institute of Certified Public Accountants (AICPA) clarified statement on auditing standards (AU-C) 500.A61.
- ▶ The ability for the auditor to refine the original analysis because it may have been inappropriately defined or to adjust or narrow the parameters to further analyze the items identified by the analysis.

The Appendix contains our responses and recommendations to selected questions the PCAOB asked in the proposing release.

* * * * *

We would be pleased to discuss our comments with members of the PCAOB or its staff at your convenience.

Very truly yours,

Ernst & Young LLP

Appendix

Q1. Does the description of auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors' use of technology-assisted analysis that we should consider?

Use of data analytics

While we agree with the general description of the use of technology-assisted analyses in the proposing release, we believe the final standard should acknowledge that data analytics are used to understand the company's flow of transactions, especially given the increase in the number and complexity of information systems and related data at many companies. We note that, while AS 2201.37 states that walkthroughs will frequently be the most effective way of obtaining this understanding, data can be used to corroborate walkthrough procedures to obtain a more complete and objective understanding of the process.

In addition, it might be difficult to obtain a complete and accurate understanding of complex, highly automated processes without using technology-assisted analyses to examine the underlying data. For example, auditors have begun to use technology-assisted analyses, such as process mining software or related techniques, to better understand the process and identify processing alternatives in a class of transactions that would be difficult to identify through inquiry, observation, inspection or re-performance of controls. This data-driven understanding can be used to more accurately identify risks of material misstatement and design more appropriate procedures to address those risks.

Given the pace of change, we believe it is critical that the final amendments be sufficiently flexible to support the use of new and emerging technology and audit techniques that may be developed in the future. Many of the technology-assisted analyses currently used and referenced in the proposing release are automated versions of traditional audit procedures, such as matching invoices to shipping documents.

While these uses of technology can increase the effectiveness of the procedures, we note that the proposal does not address an auditor's use of technology-assisted analysis to evaluate relationships in the data (e.g., the relationship of revenue, trade receivables and cash journal entries) or perform new procedures (e.g., testing controls using IT application event data) or an auditor's use of other emerging technologies (e.g., blockchain, artificial intelligence).

We believe the standards need to be principles-based to be sufficiently flexible to support the uses of technology-assisted analysis described above and the use of emerging technologies in the future.

Reason for using data analytics

The section *Reasons to Improve Auditing Standards* in the proposal cited comments about the potential for "bad actors" to use data analytics to "weaken audit quality to save money." While this concern should not be ignored, it is generally contrary to what we have experienced since we began using data analytics-driven audit procedures. Our use of data analytics is primarily driven by our desire to improve quality and investor expectations to use technology in response to the growing complexity of a company's IT applications and availability of data.

Based on our experiences, data analytics can enhance quality and help us better identify and respond to risks of material misstatement but has not reduced costs for the vast majority of our engagements, as discussed in our response to question 16.

Q3. In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?

We believe it is important to consider the benefits of technology-assisted analysis as part of the ongoing standard-setting project on SAPs (AS 2305). Data analytics are often used to perform SAPs, but as described in the proposing release, new and emerging tools and the availability of more disaggregated data can lead to SAPs that provide higher-quality audit evidence.

As described in our cover letter, disaggregated data allows us to design SAPs with precise expectations for individual items (e.g., individual lease contracts), increasing the level of evidence obtained. When designed appropriately, SAPs can be responsive to significant risks of material misstatement, so we recommend updating AS 2305.09 to acknowledge that SAPs alone may be sufficient when designed to specifically address significant risks of material misstatement.

Q7. Would the proposed amendments, that specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

While we believe that the considerations in the proposed amendments would improve the responses to assessed risks, further clarifications are needed as described in the main body of this letter.

In addition, the AICPA *Guide to Data Analytics* 4.10 provides a framework that includes an evaluation of whether the procedure has been appropriately planned and performed and, if not, directs the auditor to refine and reperform it prior to evaluating the items identified for further investigation. Given the variability inherent in large populations of data, including a similar consideration in the proposed amendment would help auditors refine the analysis before investigating items that do not affect their risk assessment or planned response.

Q9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

We appreciate the intention of the proposed amendments to validate the reliability of external information used as audit evidence. However, we believe some of the proposed language may not clarify the difference between maintaining the reliability of the external information received by the company and what the company does with that information after it is received.

For external information to be relied upon as audit evidence, the company should have processes to determine whether a complete file is received, it is maintained as received and is protected from unauthorized changes. However, when the external information begins to be processed or recorded, it is then subject to the company's transactional processes and controls, supported by appropriate IT general controls (i.e., subject to AS 1105.10). To clarify the difference between the uses of the external information, we recommend the following changes be made to AS 1105.10A:

The company may provide the auditor information that the company received from one or more external sources and maintained in its information systems in electronic form. [FN 3B excluded] When using such information as audit evidence, the auditor should evaluate whether the information is reliable for purposes of the audit by performing procedures to:

- a. Obtain an understanding of the source of the information and the company's procedures by which such information is received ~~and, recorded, maintained, and processed~~ in the company's information systems, and
- b. Test the reliability of the information, or test the controls (including, where applicable, information technology general controls ~~and automated application controls~~) over the company's procedures discussed in subpart (a) of this paragraph ~~or test the company's procedures discussed in subpart (a) of this paragraph.~~

Q10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

We are supportive of the proposed amendments that emphasize the importance of understanding the source of the external information received and maintained by the company and agree that testing controls can be an effective method to validate that the information was received completely and not modified while being maintained in the company's information systems. However, the updates made to AS 1105.08, 1105.10A and AS 1105.15 imply that the reliability of the information can only be supported by effective controls. We recommend that auditors have the flexibility to test the reliability of the external information directly, consistent with the procedures performed over information produced by the company in AS 1105.10 and used in SAPs in AS 2305.16. Refer to question 9 for our recommended changes to the proposed language in AS 1105.10A to provide this flexibility.

Q11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

No. We do not believe that the PCAOB standards should require internal controls over information produced by the company and external information maintained by the company in electronic form, because the auditor may be able to conclude that the information is reliable based on the performance of other audit procedures, such as directly testing the accuracy and completeness of the information in scenarios where internal controls are ineffective or not tested.

Further, the proposed requirements also would limit the auditor's flexibility to choose a testing approach for audits of financial statements only (i.e., non-integrated audit) and for instances where direct and dual-purpose testing are more appropriate to verify the accuracy and completeness of the information.

Q16. Are there additional potential costs that should be considered? If so, what are they?

We agree with the proposing release that the increased use of technology-assisted analysis may allow the auditor to perform engagements with fewer resources, due to automation of labor-intensive, repetitive tasks, and may significantly improve audit quality. However, we observed that the analysis in the proposing release did not explicitly consider other potential costs, such as the resources needed to execute the proposal's new requirement to test the controls over the external information maintained by the company and the resources needed to investigate items identified by the technology-assisted analysis. This investigation often requires the involvement of experienced engagement executives to interpret the behavior of data and its relationship with other financial and non-financial information. We believe considering these resource needs is important. That is, the use of technology-assisted analysis has not significantly reduced our cost of executing audit procedures. In some cases, costs have increased significantly due to the reasons mentioned above.

Our experience is also contrary to the assertion in the proposal that the fixed and variable costs for adopting data analytics is "relatively modest." In addition to the resourcing costs mentioned above, our technology and infrastructure costs have continued to increase as company financial reporting processes and related IT applications have become increasingly complex and the volume of data from these systems have expanded. Rapid technological advancements by issuers in areas such as cloud computing and process automation require continual investment by auditors to keep pace. Substantial investments are required not only for the initial building of data analytic tools and their related IT supply chains, but also for its successful implementation, support, regular updates, and related training.

Q23. How much time following SEC approval would audit firms need to implement the proposed requirements?

We believe that requiring compliance two years after SEC approval would be appropriate if the requirements are approved as proposed. For instance, to meet the new requirements in paragraph AS 1105.10A, sufficient time would be required for companies to validate that controls related to the external information they maintain are in place.

In addition, audit firms would need time to update their methodology and make relevant changes to firm tools and technology.

Q24. Would requiring compliance for fiscal years beginning after the year of SEC approval present challenges for auditors? If so, what are those challenges, and how should they be addressed?

As explained in our response to question 23, we believe that requiring compliance two fiscal years after SEC approval would be more appropriate if the proposal is approved as is.

From: Daniel Friscia <danny.friscia@gmail.com>
Sent: Monday, November 6, 2023 8:40 PM
To: Comments
Subject: [EXT]: Comment - AS 1105.22

Hello –

As it relates to AS 1105, section .22, I have a comment, broken down into parts, surrounding what is currently written. To summarize:

- I believe this section should be bifurcated between substantive tests of details procedures (i.e., procedures performed by the auditor) and controls testing procedures
- The population to which the auditor uses to test a control for operating effectiveness should be established by management and not by the auditor
 - To expand on this, controls are designed, implemented and maintained by management. (AS 5 emphasizes that management is responsible for establishing and maintaining effective internal controls over financial reporting) By that logic, the population of instances to which a control is performed should fall under management to maintain; to which management would be responsible for furnishing for operating effectiveness testing.
 - The current wording of section .22 indicates how the auditor is responsible for that population. While it makes sense that the auditor would be responsible in cases of a substantive test, since these tests are not part of managements framework to perform, controls follow a different logic.

Please let me know if my comment requires any further specificity.

--

Daniel Friscia

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Phi is for Loyalty

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August 28, 2023

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street NW
Washington, DC 20006-2803

Via Email to comments@pcaobus.org

Re: PCAOB Rulemaking Docket Matter No. 052, Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Dear Office of the Secretary:

Grant Thornton LLP appreciates the opportunity to comment on the Public Company Accounting Oversight Board's (PCAOB's or Board's) Rulemaking Docket Matter No. 052, *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (Proposal).

We commend and support the Board for undertaking an initiative to update standards that impact auditors' use of technology-assisted analysis (TAA), especially given the increasing pervasiveness and complexity of such analyses that are being used today in audits to varying degrees. We believe that significant benefits can be realized by employing TAA on audit engagements, including, as highlighted in the Proposal, designing and performing audit procedures more effectively and efficiently, fostering continuous improvement in audit quality. Such benefits can be maximized by auditing standards that are sufficiently principles-based and promote the performance of appropriate risk-based procedures.

We respectfully submit our comments and recommendations for the Board's consideration. Please note that we have included as an Appendix to this letter our responses to certain questions posed in the Proposal.



Sufficiency and appropriateness of audit evidence

Technology-assisted analytics increasingly enable the performance of multipurpose procedures that gather audit evidence that may not neatly fit into an existing category or sub-category of audit procedures under PCAOB standards, and that exercise is only likely to grow more challenging as technology and audit procedures continue to evolve. As the Board continues to deliberate the Proposal and carve a path forward, we believe the focus should be on the sufficiency and appropriateness of audit evidence obtained, as opposed to the classification or type of procedure performed to obtain that evidence. We note that such an approach was undertaken by the AICPA's Auditing Standards Board in Statement on Auditing Standards 142, *Audit Evidence*, codified in AU-C section 500. We believe such focus would increase auditors' confidence in adopting and using TAA while appropriately addressing the related risks of material misstatement to the financial statements. We encourage the Board to consider the requirements and related guidance of AU-C section 500 because we believe those requirements would facilitate successful adoption of TAA while remaining appropriately principles- and risk-based.

We provide additional considerations regarding the sufficiency and appropriateness of audit evidence in the Appendix to our letter.

Iterative nature of audit procedures

While recognizing that an audit is dynamic and iterative, PCAOB standards, inclusive of the amended language in the Proposal, generally assume that the intent of an audit procedure is fully established upfront. In practice, however, auditors may initially design a procedure for a single purpose but ultimately discover that the evidence obtained from performing that procedure can be used for more than one purpose.

AS 2305, *Substantive Analytical Procedures* establishes that "The auditor develops such expectations by identifying and using plausible relationships that are reasonably expected to exist based on the auditor's understanding of the client and of the industry in which the client operates." We believe auditors may discover new information from the performance of an analytical procedure or other type of procedure using TAA that refines their initially developed expectations. Even further, TAA could allow auditors to both identify and develop expectations from the results of the analysis itself.

Therefore, we recommend that the final standard acknowledge that audit procedures involving TAA can be iterative in nature and that the purpose or intent of the procedure and expectations, whether explicit or implicit, may evolve while executing the analysis, resulting in multifaceted procedures.

Auditor investigation of items

We support providing greater clarity in the standards with regard to the investigation of items meeting the criteria established by the auditor but suggest that the Board provide additional guidance in this area. Specifically, the Proposal could explore situations the auditor may face when performing audit procedures covering 100% of the population using TAA. We provide detailed recommendations regarding this topic in the Appendix to our letter.



Responsibilities for evaluating the reliability of external information

Given that TAA incorporates the use of increasingly large volumes of electronic information, including data from external sources, we support the Proposal addressing the reliability of information used in the auditor's procedures. However, we are concerned that certain language introduced in the Proposal may be unclear, such as the phrase "external information maintained by the company in electronic form." The ambiguity of this terminology could cause misunderstanding and create inconsistencies in practice. We believe additional examples or guidance would help alleviate potential practical application challenges and reduce the potential for diverse practices. Refer to our detailed responses in the Appendix to our letter.

Additionally, the proposed amendments require tests of controls, inclusive of information technology general controls (ITGC) and automated application controls, over external information maintained by the company in electronic form. Requiring tests of controls in this manner could result in potential unintended consequences related to the use of TAA. For example, the proposed amendments might disincentivize auditors from utilizing TAA when the entity maintains external information because the cost and effort to tests all relevant controls may outweigh the intended benefits. Companies also might not have adequate or effective controls over such information, and the amendments as proposed imply the auditor would not be able to leverage the external information maintained by the company in such situations. We believe this creates an unnecessary difference with existing requirements; for example, in a financial statement audit, an auditor is able to perform other procedures to determine the relevance and reliability of external information, even information maintained in electronic form. Further, if ITGCs were deemed ineffective, the auditor would be unable to rely on automated application controls and would, therefore, perform other procedures over such external information. We provide suggested revisions to certain language proposed within AS 1105, *Audit Evidence* to clarify and align this content with existing requirements.

We would be pleased to discuss our comments with you. If you have any questions, please contact Jeff Hughes, National Managing Partner of Audit Quality and Risk, at 404-475-0130 or Jeff.Hughes@us.gt.com.

Sincerely,

/s/ Grant Thornton LLP



Appendix: Responses to certain questions within the Proposal

Question 3. In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?

We acknowledge and support the PCAOB's active, short-term standard-setting project related to AS 2305. With respect to this Proposal, it is important that the substantive analytical procedures (SAP) project include consideration of TAA and the interaction with the proposed amendments to AS 1105 and AS 2301.

We recommend that updates to AS 2305 reconsider the following presumptions that currently exist in the standard:

- It is unlikely that audit evidence obtained from SAPs alone will be sufficient to respond to significant risks
- SAPs alone are not well suited to detecting fraud.

We believe it is possible to design and perform an SAP to obtain sufficient appropriate audit evidence that addresses significant risks of material misstatement and therefore, encourage the PCAOB to consider further amendments to the language in AS 2305.09 that note it is "unlikely." We believe that SAPs performed using TAA could be very effective at identifying factors that can influence financial relationships and enable auditors to develop very precise expectations, whether explicit or implicit, via the use of increasingly disaggregated information, including at an individual item level. Use of advanced statistical approaches (for example, regression-based techniques) and advanced analytics that incorporate large populations of relevant and reliable external information are just two examples of factors that can facilitate the development and execution of an appropriate SAP in response to a significant risk.

We also believe that SAPs performed via TAA could be appropriately designed to detect material misstatement due to fraud. Modern analytics, including transactional-scoring models utilizing sophisticated routines and composite risk scoring at the unique journal entry level, are significantly more advanced than traditional fraud-focused analytics and are, therefore, well-positioned to detect potential fraud and management override.



Question 4. Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

We appreciate the Board's efforts to address a topic that is often viewed as challenging. We are concerned, however, that the proposed amendments may not adequately clarify the differences between tests of details (TODs) and analytical procedures, nor fully alleviate the challenges we see in practice in this area.

Our primary recommendation would be to focus the proposed amendments on the sufficiency and appropriateness of audit evidence obtained, as opposed to the classification of the procedure performed to obtain that evidence, as that will increase auditors' confidence in adopting and using TAA while maintaining appropriate focus on addressing the related risks of material misstatement to the financial statements. We believe that some advanced analytics available today may not precisely meet one classification of procedure as currently proposed to be defined but could nonetheless provide sufficient appropriate audit evidence, considering its precision. This is why we recommend the focus be on the persuasiveness of the evidence gathered versus characterizing evidence based on the type of procedure performed.

At the same time, we understand and acknowledge the practicality of introducing a definition for TODs given the questions surrounding classification, and we support introducing such a definition. On the other hand, we believe that analytical procedures are well-understood and clearly defined currently in AS 2305.02. Therefore, we recommend that the Board exclude from the proposed TOD definition provided in the note to paragraph .13(b) of AS 1105 the language referencing and directly contrasting with analytical procedures. We also recommend parallel updates to AS 1105.21 that would remove the discussion contrasting analytical procedures and TODs and ask the Board to specifically clarify that the use of technology may enable the auditor to design and perform an analytical procedure at a disaggregated level, including individual items in an account or disclosure.

Our recommended edits to the note to paragraph 13 and paragraph 21 of AS 1105 are as follows (deletions in ~~strike through~~ and additions in ***bold italics***):

.13 ...

Note: A test of details involves performing audit procedures with respect to individual items included in an account or disclosure. ~~, whereas analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts. [FN 7A]~~

[FN7A] See also paragraph .21 of this standard.

.21 Analytical procedures consist of evaluations of financial information made by an analysis of plausible relationships among both financial and nonfinancial data that can be external or company-produced. Analytical procedures ***may involve developing expectations, whether explicit or implicit, at an aggregate or individual item level and*** also encompass the investigation of significant differences from expected amounts. ~~Unlike tests of details, analytical procedures generally do not involve evaluating individual items included in an account or~~



~~disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts. [FN 11 excluded]~~

Question 6. Are the proposed requirements that specify the auditor's responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

We are supportive of the objective of the requirements to specify the auditor's responsibilities when using audit evidence from an audit procedure intended to achieve more than one purpose. We believe our recommendations below could enhance the understandability and practicability of the proposed amendments.

As noted in the body of our letter, the standards, including the amended language in the Proposal, assume that the intent of an audit procedure is generally understood upfront, which may not always be the case in practice. For example, when using TAA to substantively test a population of transactions, the auditor may identify a sub-population of transactions that exhibit different characteristics than the rest of the population and then use that information to modify the risk assessment of the sub-population.

We believe that documenting the nature of the analysis and the results of the procedures performed would be sufficient to demonstrate the purpose(s) of the procedures and whether they had been achieved. As such, we recommend that paragraph AS 1105.14 be updated to focus on whether the audit evidence obtained from the TAA is sufficient and appropriate to achieve each relevant objective.

Finally, in order to provide additional guidance and promote consistency in practice, we suggest that the PCAOB include an example of audit evidence from an audit procedure that achieves more than one purpose. We recommend incorporating an example similar to the example provided in Exhibit A of AU-C section 500.¹

Question 7. Would the proposed amendments, that specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

While we support the Board proposing additional guidance related to the investigation of items meeting criteria established by the auditor when designing or performing substantive procedures, we believe proposed AS 2301.37A(a) through (d) are already addressed through PCAOB standards and, therefore, we believe that firms are already complying with these requirements.² We believe that the requirements proposed in AS

¹ [AICPA AU-C section 500](#) paragraph A69

² For example, when the auditor obtains evidence during the audit that contradicts the audit evidence on which the original risk assessment was based, AS 2110.74 requires the auditor to revise the risk assessment and either modify the planned audit procedures or perform additional procedures in response to the revised risk assessment (see also AS 2301.46) which is consistent with the proposed amendments to .37A bullets a, b, and d. We also believe that bullet c of the proposed amendments to paragraph .37A is addressed through the requirements within AS 2201.08 and AS 2315.26.



2301.37A would be even more effective in practice if the requirements address the following topics:

- If a procedure that addresses 100% of the population using TAA returns items within the population that meet the criteria established by the auditor, it would be acceptable to select items from that population for testing, such as by applying audit sampling.
- If a procedure that addresses 100% of the population (and appropriately addresses the risk(s) of material misstatement) using TAA returns no items within the population that meet the criteria established by the auditor, it would be acceptable to perform no additional procedures (assuming the auditor has already evaluated the relevance and reliability of the information used in the procedure). Though we believe the requirements, as currently proposed, would indicate that the procedures performed are indeed sufficient, explicit guidance to this effect would be beneficial.

Question 9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

We appreciate the inclusion of AS 1105.10A to clarify the auditor's responsibility for external information maintained by the company in electronic form. We offer the following observations in consideration of maximizing the operability of the proposed requirement.

We are concerned about the potential ambiguity of certain terms used throughout the Proposal, in particular the phrase "external information maintained by the company in electronic form." In proposed AS 1105.10A, the phrase "maintained *in its information systems* in electronic form [emphasis added]" is used. We believe the Board intends that the use and intended meaning of "information systems" aligns with AS 2110.28, which focuses on information systems that are relevant to financial reporting. External information maintained by the company in its information systems in electronic form (for example, customer purchase order information) is typically subject to ITGCs, whereas a PDF bank statement downloaded by an employee and maintained on their local computer may not be subject to the same nature or extent of ITGCs. As such, it could be beneficial for the PCAOB to link the proposed amendments more clearly to existing terminology in AS 2110.

Additionally, we note that the proposed language in AS 1105.10A(b), which states that the auditor can "*test the company's procedures* discussed in subpart (a) of this paragraph [emphasis added]" is not consistent with terminology or phrasing used elsewhere in PCAOB standards. In contrast, AS 1105.10 permits the auditor to perform procedures to directly test the accuracy and completeness of information produced by the company. It is unclear whether the Board intends for "test the company's procedures" to provide an option similar to that described within AS 1105.10A in relation to directly performing procedures to evaluate the reliability of external information maintained by the company in its information systems in electronic form. We believe the standard should specify that it would be appropriate for the auditor to directly perform procedures to evaluate the reliability of such information in AS 1105.10A. We recommend updating AS 1105.10A(b) as follows (deletions in ~~strike through~~ and additions in ***bold italics***):



.10A ...

b. Test ~~controls~~ **the reliability of the information, which may include** (including **testing** information technology general controls and automated application controls) over the company's procedures discussed in subpart (a) of this paragraph ~~or test the company's procedures discussed in subpart (a) of this paragraph.~~

We are concerned that a potential unintended consequence of a required controls-based approach is increased scope limitations in instances where either controls may not be effective or the company does not perform other procedures to evaluate the completeness and accuracy of the information. In these circumstances, it may still be possible for the auditor to independently gather audit evidence supporting that the external information is reliable. Finally, under the existing standards, determination of which controls to test is based on risk assessment. AS 2201.11 states that "[I]t is not necessary to test controls that, even if deficient, would not present a reasonable possibility of material misstatement to the financial statements."

Question 10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

We support emphasizing the importance of controls through the proposed updates to AS 1105. Nevertheless, we are concerned that the amendments, as proposed, will require tests of controls. In particular, it appears the proposed amendments to paragraph 15 of AS 1105 imply that the auditor cannot perform procedures to establish the reliability of information if the controls are found to be ineffective. We recommend that paragraph 15 be updated to mirror the language in paragraph 8.

Additionally, we support addressing information that has been modified from its original form, whether in hard copy or in electronic form. Such transformation might introduce additional risks that could impact the reliability of information. We continue to believe that copies of documents can be sufficient unless the auditor has concerns with regard to their authenticity. We do believe the notion of "original documents" in paragraph 8 could be modernized to reflect the reality that some information and documents may exist only in electronic form (as opposed to the electronic form of the document being a copy of the original) or that a transaction may not be recorded in a physical document at all.

Question 11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

We believe that PCAOB standards should not require tests of controls over external information maintained by the company in electronic form in order for such information to be considered reliable audit evidence. In some situations, internal controls over such information may not be effective or could be outside the scope of the company's internal controls over financial reporting. However, we believe auditors could still be able to



conclude that the information is reliable based on the performance of other audit procedures, which is allowed under existing standards for information produced by the entity in a financial statement audit. Therefore, we do not support the level of prescription that comes with requiring tests of controls over external information maintained by the company in electronic form.

Question 24. Would requiring compliance for fiscal years beginning after the year of SEC approval present challenges for auditors? If so, what are those challenges, and how should they be addressed?

In order for firms to adopt the updated standards appropriately and thoughtfully into their methodologies, sufficient implementation time must be given, and each project cannot be viewed individually. As the Board continues to work through the standard-setting agenda, we are concerned about firms' ability to dedicate sufficient resources within compressed implementation periods to adequately address the changes in the Board's auditing standards.

In consideration of the proposed amendments and our observations herein, we recommend an effective date of years ending on or after December 15 that occurs two years after the year of SEC approval. For example, if the SEC approves the Proposal in 2024, the amendments would be effective for years ending on or after December 15, 2026.

August 28, 2023

Ms. Phoebe Brown
Office of the Secretary
Public Company Accounting Oversight Board
1666 K St, NW
Washington, DC 20006-2803

PCAOB Release No. 2023-0004, June 26, 2023: Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Dear Secretary Brown and PCAOB Board Members:

Johnson Global Accountancy is pleased to submit its comments on the proposed amendments to AS 1105, *Audit Evidence* and AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and to making confirming amendments to other related PCAOB auditing standards.

Johnson Global Accountancy's mission is to be the most innovative and technically excellent advisory firm at the intersection of companies, auditors, and regulators, which improves investor decision-making confidence. We serve a diverse group of audit firms ranging from single office firms to more complex regional firms and the top 20 firms. We help firms interpret, respond, and comply with global auditing and financial reporting standards and regulatory requirements, including those standards set by the PCAOB. Our team of financial reporting quality advisors helps prepare firms to perform high-quality audits using innovative tools with a shared commitment to implement effective policies, procedures, and controls. We also provide firms with integrated software and service solutions to help them comply with audit quality standards.

Overall, we support the PCAOB's objective to improve audit quality and enhance investor protection to reflect the growing use of technology in audits. Modernizing the standards to address audit procedures that involve analyzing information in electronic form with technology-based tools is welcome and needed. This is an important step forward to address this rapidly changing environment. We encourage the Board to continue developing principles-based standards adaptable to these evolving changes and to firms of all sizes.

In our audit quality advisory work, we observe engagement teams at various firms using technology-based tools to produce audit evidence. We agree with the research that audit firms of all sizes are expanding their use of technology to perform audit procedures. We also note, however, that certain firms have reported that they remain hesitant to use technology-based analytical tools. They appear to need further guidance to reinforce their comfort that technology-

based analysis will in fact, produce better quality audit evidence that complies with existing standards.

In many respects, the proposed amendments reflect ongoing current practices and provide clarity in certain areas. We do, however, believe that additional clarity and guidance is required. The Board should consider providing additional guidance and examples to illustrate how technology-based tools can be used in key audit areas to identify, assess and respond to the risks of material misstatements. Guidance on evaluating results of such procedures, including, for example, where an entire population is assessed, is important for the auditing profession. Guidance that is supported by principles and theory (in particular, with respect to sampling) is needed to illustrate the implications, how to address them and to ensure consistency amongst the entire auditing profession.

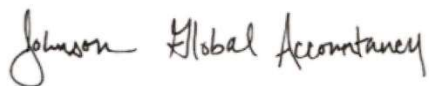
The Board's May 2021 *Spotlight: Data and Technology Research Project Update* ("May 2021 Data Spotlight") provided helpful updates for inventory and the confirmation process. We encourage the Board to continue to provide additional guidance and examples by account area as well as by auditing standard area.

We also encourage the Board to expand their work related to data and technology to consider and address the need for IT audit specialists to support financial statement and integrated audits. The current demand appears to exceed supply and should also be considered as part of modernizing the auditing standards for the smaller firm audit marketplace.

We set out our comments on selected questions posed by the Board in the Proposal in the attached Appendix.

We appreciate the opportunity to provide our comments and support the PCAOB's efforts to improve auditing standards to enhance audit quality and better protect investors. We would be pleased to discuss our comments with you at your convenience. Please direct any questions to Jackson Johnson, President (jjohnson@jgacpa.com) or Joe Lynch, Managing Director and Shareholder (JLynch@jgacpa.com) or Santina Rocca, Managing Director (SRocca@jgacpa.com). They may be reached at (702) 848-7084.

Sincerely,

A handwritten signature in black ink that reads "Johnson Global Accountancy". The signature is written in a cursive, flowing style.

Johnson Global Accountancy

Appendix A

Improving Standards

- 1. Does the description of auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors' use of technology-assisted analysis that we should consider?**

The description of current audit practice is generally accurate. We encourage considering and adding topics that influence or persuade firms to avoid using technology when it would otherwise be helpful to them to perform a more effective and efficient audit. Auditors have expressed concerns to us regarding the time to learn a new tool, evaluate its efficacy, determine how to address the volumes of data and analyses used, determine the appropriate tool to use, and uncertainty over whether the tool in fact does what it says it does.

The PCAOB could play a pivotal role in assisting smaller firms stay in the market by collecting, summarizing, and analyzing the strengths and pitfalls of tools. We encourage a particular focus on this market segment to continue fostering competition and the ability to produce quality audits for all investors.

The Board could do this with additional explanatory material or separate guidance. For smaller firms who may lack access to the resources of larger audit firms, we encourage that such guidance be set out by financial statement account area.

This would help level the playing field so that all audits are performed to an equal standard.

- 3. In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?**

We encourage the Board to add further explanatory guidance to the proposal to illustrate how auditors can use technology to perform more effective and efficient audits in specific financial statement account areas. Material included in the May 2021 Data Spotlight for inventory and confirmations should be enhanced and considered for inclusion in the related standards or consolidated in one area as "additional guidance for technology-assisted analysis". Including material in multiple places throughout PCAOB guidance is an obstacle for auditors, particularly, for international and smaller firm auditors.

Tests of Details, Analytical Procedures and Disaggregation (Proposed Paragraphs .07, .13 and .21 of AS 1105)

4. Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

The proposal to amend paragraphs .13 and .21 of AS 1105 to clarify the meaning of “test of details” is appropriate. However, we believe that additional guidance and clarification is needed for analytical procedures.

Proposed paragraph 13 of AS 1105 notes that *“A test of detail involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures generally do not involve evaluating individual items included in account or disclosure, unless those items are part of the auditor’s investigation of significant differences from expected amounts.”*

Page 17 of the Release notes that an *“audit procedure that uses technology-assisted analysis to develop an auditor’s expectation for interest income in total for the account, would be considered an analytical procedure, not a test of details, if the procedure was not applied to individual items in the account.”* It may not be clear to audit professionals what is meant by “if the procedure was not applied to individual items in the account”. This example would be clearer if it were supplemented with the actual details rather than a description.

Analytical procedures remain a challenging area for auditors to perform well. We encourage the Board to expand the explanations and guidance for analytical and substantive analytical procedures. The approach should be relatively similar between the two – determining an expectation and evaluating differences from expectations. We encourage robust examples of both types to assist auditors with understanding the differences and how both approaches add value to the audit. Without the additional explanations, the clarity will only come following an inspection which is too late in the process to protect investors and benefit the audit process.

We also encourage incorporating the guidance included in Staff Audit Practice Alert No. 15, *Matters Related to Auditing Revenue from Contracts with Customers*, regarding performing substantive analytical procedures to test revenue.

5. Would the proposed amendment that states that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure improve the auditor’s evaluation of the relevance of audit evidence? If not, what changes should be made?

Amendments to Paragraph .07 to clarify that the level of disaggregation affects the relevance of audit evidence obtained is helpful and generally consistent with audit practice.

Paragraph .7c. *“The level of disaggregation or detail of information necessary to achieve the objective of the audit procedures”* provides additional clear guidance for auditors.

However, we encourage the inclusion of additional examples to illustrate what disaggregation means and looks like. This is an area we often discuss with firms as to whether they have sufficiently disaggregated the data to reach their conclusions. This most often arises with analytical reviews, whether substantive or otherwise.

Using Audit Evidence for More than One Purpose (Proposed Paragraph .14 of AS 1105)

6. Are the proposed requirements that specify the auditor’s responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

The Release notes that proposed paragraph .14 of AS 1105 would specify that *“if an auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedures to achieve each of the relevant objectives.”* This appears to imply that the auditor must **intend** to use the audit procedures for more than one purpose. Without that initial intent, it appears to prohibit an auditor from using the evidence, even if it were appropriate in the circumstances.

Accordingly, the proposal appears to require that the auditor determine the purpose and objective of multi-purpose tests before performing them even though they may later find that the audit evidence supported more than one purpose.

Overall, we support clarifying the use of audit evidence for more than one purpose; we, however, have significant concerns about the proposal prohibiting an auditor from using the audit evidence later in their audit. This seems to somewhat contradict revising the risk assessment throughout the audit in response to additional information about risks. We encourage further clarity on this point.

Investigation of Items When Designing or Performing Substantive Audit Procedures (Proposed Paragraph .37A of AS 2301)

7. Would the proposed amendments, that specify considerations for the auditor’s investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

In most respects, the proposed steps align with how auditors evaluate audit evidence in practice. It is not clear, however, that the proposed steps address the scenarios highlighted in the Release itself.

The Release identifies on page 21 that “technology-assisted analysis may enable the auditor to examine all items in a population” and that it is “possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor.”

While we acknowledge that it may not be possible to identify all scenarios and that auditing standards need to be principles-based in this evolving area, we encourage the Board to add additional examples (on a continuum) to illustrate how auditors should approach various results. This would help clarify expectations for auditors and reinforce consistency within the audit profession.

Technology-assisted analysis has expanded the availability of data and the ability to analyze; further guidance on how to deal with outliers, exceptions etc. is needed.

We suggest including the examples on page 22 of the Release related to revenue and raw material to standard itself or to separate guidance. Expanding this list of examples and scenarios in additional explanatory guidance would help audit practitioners.

Evaluating Reliability of Certain Audit Evidence (Proposed Paragraphs .08, 10, .10A, .15, .19 and .21 of AS 1105)

- 9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?**

Definition of “more reliable”

Paragraph .8 states that *“information produced by the company and external information maintained by the company in electronic form are more reliable when the company’s controls over that information, including where applicable, its information technology general controls and automated application controls are effective.”*

It is not clear from this proposed amendment what “are more reliable” means and how an auditor would apply that criterion. Does this imply that the auditor needs to perform more testing? Is the auditor required to test the controls to use information produced by the company? The “are more reliable” term including the related scale should be defined.

Reliability of electronic information

We are further concerned that this paragraph may suggest information produced in electronic form is generally more reliable even though the paragraph goes on to state that the auditor needs to determine that the “company’s controls over that information, including where applicable, its information technology general controls and automated application controls, are effective”.

Requirement to test controls

It is further unclear whether the PCAOB expects auditors to test the controls to use any information produced by the company or external parties. There are circumstances where an auditor can test that information is reliable without testing controls, including for example, confirming information with third parties.

10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

We support emphasizing the importance of controls over information technology. We expect auditors to understand the related controls and that this helps to perform a more effective risk assessment as required by existing standards.

We are concerned, however, that the proposal appears to significantly expand and diverge from existing auditing standards by including a reference in paragraph. 10 to test controls over information produced by the company including “where applicable, information technology general controls and automated application controls”. This seems to suggest that information produced by the company that is subject to control tests is more reliable than other evidence. Accordingly, this would appear to imply that without testing controls and information technology general controls, audit evidence produced by the company is not reliable.

We recommend defining “where applicable” with clear factors or examples of when information technology general controls and automated controls would be applicable.

11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

Auditing standards should continue to remain principles-based and not require the testing of internal controls to use information as reliable audit evidence. There are numerous scenarios, especially in smaller issuers, where internal controls may not be effective and testing the controls would not be appropriate or necessary. We agree that auditors need to understand the internal control environment, but we do not agree that leads to a requirement to test controls.

We also encourage the Board to consider the implications of technology on the current resources available to firms. Auditors with expertise in technology controls continue to be in demand and are in short supply. Expanding these requirements to require this type of testing will place a significant burden on firms, especially smaller firms. We suggest continued research in this area. The PCAOB can play a vital role in evaluating the most effective way to ensure that the audit profession is ready to perform effective audits with the evolving technology changes.



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August 25, 2023

By email: comments@pcaob.org

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street, NW
Washington, DC 20006-2803

RE: PCAOB Rulemaking Docket Matter No. 052: PCAOB Release No. 2023-004: Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Dear Office of the Secretary:

We appreciate the opportunity to comment on the Public Company Accounting Oversight Board's (PCAOB or the Board) Release No. 2023-004, *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (the Release). The Proposed Amendments to AS 1105, *Audit Evidence*, and AS 2301, *The Auditor's Responses to the Risks of Material Misstatement* included in the Release are herein referred to as the Proposed Amendments. We acknowledge the considerable effort put into the creation of the Release and the Proposed Amendments and commend the Board for modernizing the standards. However, we believe further clarification is needed in the language of the Proposed Amendments and related Release to enable them to remain principles-based and adaptable to the evolving technology-enabled audit procedures.

The remainder of this letter provides our specific comments on the Proposed Amendments.

Evaluating the sufficiency and appropriateness of audit evidence using technology-assisted analysis

In general, we believe the description of auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depicts some of the current practices. However, even when not considering artificial intelligence, we believe there are and will continue to be more ways to use technologies currently in practice that are not contemplated in the Release. See further discussion in our response to question 1.

The Proposed Amendments could be clearer on how an auditor considers the sufficiency and appropriateness of audit evidence provided through technology-assisted analysis when used to respond to risks. The Proposed Amendments provides further distinction between tests of details (TOD) and substantive analytical procedures (SAP), without acknowledging that there may be elements of both in a technology-assisted analysis. We encourage the Board to focus on flexible and scalable principles based on the nature of the evidence obtained from the use of technology-assisted analysis to enable the standards to remain relevant and adaptable in the face of evolving technology. We provide suggested revisions below that stress the importance of auditor judgment when evaluating the persuasiveness of audit evidence in totality. These suggested principle-based concepts would provide for a more adaptable landscape of the standards, resulting in further longevity of the standards as technology used to execute audit procedures continues to advance.

Office of the Secretary
Public Company Accounting Oversight Board
August 25, 2023
Page 2 of 2

Specifying auditor responsibilities for evaluating the reliability of certain audit evidence

We agree it is important that auditors perform sufficient procedures to evaluate the reliability of information used as audit evidence. However, when information is used by auditors and not used in the company's internal control over financial reporting, we believe testing the reliability of such information without testing the company's controls may also provide sufficient and appropriate evidence. We are not clear what is meant by "test the company's procedures discussed in subpart (a) of this paragraph" within proposed AS 1105.10A(b). This is the second of two alternatives available for evaluating the reliability of external information obtained from the company, the first of which enables auditors to evaluate reliability of such information by testing controls over the company's procedures to receive, record, maintain, and process external information in the company's information system. How 'test the company's procedures' is intended to differ from testing the company's controls over the company's procedures is not clear. We recommend the Proposed Amendments be revised to clarify the Board's intended auditor performance when following the 'test the company's procedures' alternative to enable auditors to consistently perform procedures aligned with the Board's expectations.

Interdependencies of AS 2305, Substantive Analytical Procedures

We believe the amendments to AS 1105 and AS 2301 as proposed, should be considered in conjunction with AS 2305, *Substantive Analytical Procedures*, as the topics are interrelated. Considering the Proposed Amendments independent from any amendments to AS 2305 could result in a disconnect from AS 1105 and AS 2301 or cause additional confusion related to obtaining sufficient appropriate audit evidence when executing audit procedures using technology-assisted analysis.

Importance of transparency in standard-setting

We support the goal of increasing transparency in the Board's actions, including with respect to projects on the Board's standard setting and research project agendas. The Release states it was informed by the PCAOB staff's research project on Data and Technology. We thank the Board for the prior outreach of the PCAOB staff in understanding our use of technology in the audit and for engaging in meaningful discussions with audit firms and the Center for Audit Quality about challenges auditors face based on the extant standards. Further transparency around where the Board considers future standard-setting to be headed, inclusive of the use of emerging technologies in an audit, would allow stakeholders to engage early and provide timely and evolving perspectives. We encourage the Board to continue with similar outreach on future standard setting projects.

* * * * *

We appreciate the Board's consideration of our comments and observations in support of revising the auditing standards to enhance audit quality, and we would be pleased to discuss our comments with the Board and its staff at your convenience. We look forward to continuing our engagement with the Board and its staff in support of our shared commitment of investor protection and audit quality.

Sincerely,

KPMG LLP

KPMG LLP



Appendix

Below are responses to select questions in the Release for which we had specific input. For proposed revisions, language to be deleted is ~~struck through~~; language to be added is underlined.

Auditors' use of technology-assisted analysis in designing and performing audit procedures

1. Does the description of the auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors' use of technology-assisted analysis that we should consider?

The Release indicates auditors primarily use technology-assisted analysis when identifying and assessing risks of material misstatement to identify new risks or to refine the assessment of known risks.¹ Technology-assisted analysis is evolving quickly and has likely accelerated the use of more expansive and advanced technologies beyond the use cases found when research was conducted.

When considering the use of technology-assisted analysis to support substantive procedures, we believe the examples in the Release are narrowly focused on using technology-assisted analysis to identify items for further investigation. As discussed in our response to question 7, this may imply the Board intends auditors to use technology-assisted analysis solely for risk assessment procedures or for selecting specific items when responding to risks rather than to directly respond to risks. We believe technology-assisted analysis may be used to respond to risks.

An example of using technology-assisted analysis to respond to risks is:

An auditor may design a substantive analytical procedure to evaluate whether the characteristics of individual revenue transactions meet expected plausible and predictable relationships. The technology-assisted data analysis may be sufficient to respond to the assessed risk of material misstatement for the transactions exhibiting characteristics consistent with the auditor's expectations.

We therefore request the Board to make clear in the final amendments whether it intends for technology-assisted analysis to only be suitable for risk assessment or whether such analyses may be used to respond to risks of material misstatement.

2. Does the release accurately describe aspects of designing and performing audit procedures involving technology-assisted analysis where improvements to PCAOB standards may be necessary?

As procedures can be performed concurrently, we agree that as technology advances and the use of technology-assisted analysis continues to increase, lines become blurred between the purpose of audit procedures (risk assessment procedures and procedures responsive to identified risks), categories of audit procedures (substantive procedures and test of controls), and the distinction between substantive procedures as a TOD versus a SAP. We believe AS 2305 is clear on defining a SAP based on its nature, including when using technology-assisted analysis. However, we believe there is benefit to further clarifying how to apply some of the concepts within AS 2305, such as AS 2305.17 related to precision, when using technology-assisted analysis.

However, we believe standards should enable the auditor to evaluate the sufficiency of audit evidence obtained rather than limiting the evaluation to distinct phases or classifications of risk assessment, test of controls, and substantive procedures. Specifically, as it relates to the Proposed Amendments to clarify the difference between a TOD and a SAP, we suggest that the standards go further to recognize that technology-assisted analysis in certain circumstances may contain elements of both a TOD and a SAP or

¹ See page 11 of the Release.

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may even have the potential to be classified as a third type of substantive procedure altogether that provides sufficient appropriate audit evidence. See also our response to question 4.

3. In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address use of technology-assisted analysis in audits?

We believe the amendments to AS 1105 and AS 2301, as proposed, should be considered in conjunction with AS 2305, as the topics are interrelated. Considering the Proposed Amendments independent from any amendments to AS 2305 could result in a disconnect from AS 1105 and AS 2301 or cause additional confusion related to obtaining sufficient appropriate audit evidence when executing audit procedures using technology-assisted analysis. For example, AS 2305.02 focuses on the nature of a procedure when stating “analytical procedures range from simple comparisons to the use of complex models involving many relationships and elements of data. A basic premise underlying the application of analytical procedures is that plausible relationships among data may reasonably be expected to exist and continue in the absence of known conditions to the contrary.” This focus on the nature of the procedure may be interpreted to be inconsistent with the update to AS 1105.13 that states “a test of details involves performing audit procedures with respect to individual items included in an account or disclosure” as this proposed language does not seem to consider the nature of the procedure. Accordingly, combining the efforts to update the auditing standards for implications related to technology-assisted analysis with the Board’s project on SAPs would enable the Board to propose an integrated set of amendments to the standards that provide clarity about how the Board intends auditors to apply the standards when using technology.

Clarifying the differences between tests of details and analytical procedures and emphasizing the importance of appropriate disaggregation or detail of information

4. Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

If the Board’s intention is to retain the distinction between a TOD and SAP, we are concerned that the Proposed Amendments could be interpreted as inconsistent with AS 2305. The Proposed Amendments to AS 1105.21 states “Unlike tests of details, analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor’s investigation of significant differences from expected amounts.” However, the Proposed Amendments do not provide clarity around when analytical procedures could involve evaluating individual items. The use of ‘generally’ implies the Board believes there are circumstances where SAPs could involve evaluating individual items and we agree. We believe SAPs are procedures involving the development of expectations about plausible relationships irrespective of the level of disaggregation at which the expectations are applied (e.g. account balance vs. transaction level) based on AS 2305, whereas a TOD involves specific types of procedures discussed in AS 1105.15-21, such as inspection and recalculation.

The Release provides an example where an interest expense SAP could “involve the auditor developing an expectation about the amount of the expense based on information available to the auditor about the par value of the financial instruments and the applicable interest rates, comparing the expectation to the company’s recorded interest expense, and investigating significant differences between the company’s recorded amount and the auditor’s expectation.”² This SAP could be performed at an individual item level if expectations are developed for each individual financial instrument.

Since AS 2305 already clearly lays out the nature of audit procedures that fall into this standard, we suggest focusing the Proposed Amendments on updating the definition of a TOD and not adding any additional guidance to the definition of a SAP.

Further, the language in the Proposed Amendment that indicates “a test of details involves performing audit procedures with respect to individual items included in an account or disclosure” could also make it difficult

² See page 16 of the Release.

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for auditors to classify technology-assisted analysis performed at a transaction level into one of the types of procedures that are currently defined in AS 1105.15-21 because sophisticated technology-assisted analyses may not involve these traditional testing techniques.

Therefore, we request clarification on when a SAP could involve evaluating individual items included in an account or disclosure, and we suggest amending AS 1105.14 to clarify that the audit procedures described in Paragraphs 15-21 are not comprehensive.

5. Would the proposed amendment that states that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure improve the auditor’s evaluation of the relevance of audit evidence? If not, what changes should be made?

We agree the relevance of audit evidence depends on the level of disaggregation or detail of information necessary to achieve the objective of the procedure and believe this is already contemplated by auditors in practice.

Specifying the auditor’s responsibilities when using audit evidence for more than one purpose

6. Are the proposed requirements that specify the auditor’s responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

We believe that the provisions of the Proposed Amendments specifying the auditors’ responsibilities when using audit evidence from an audit procedure to achieve more than one purpose are, in most aspects, sufficiently clear and appropriate. However, proposed AS 1105.14 states, “the auditor should design and perform the procedure to achieve each of the relevant objectives.” We agree that the procedure should achieve each of the relevant objectives. However, we are concerned that ‘should design and perform’ presumes that the auditor’s initial design of the procedure considers all possible objectives and how the resulting evidence may be used to satisfy those objectives, which may not always be possible. If the auditor does not initially design the procedure to achieve a certain objective, but the evidence provided by the procedure also achieves a separate objective, we believe the auditor should still be able to evaluate the evidence against the unplanned audit objective. We therefore suggest the Board allow auditors to evaluate the evidence obtained against planned and subsequently identified audit objectives. An example is updating proposed AS 1105.14 to state:

.14 Paragraphs .15-.21 of this standard describe specific audit procedures. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedures. The auditor may design and perform an audit procedure that achieves more than one purpose, in which case if the auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure should be sufficient and appropriate to achieve each of the relevant objectives.

Specifying considerations for the auditor’s investigation of items when designing or performing substantive audit procedures

7. Would the proposed amendments, that specify considerations for the auditor’s investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

Although not necessarily new concepts, we support the Proposed Amendments to specify the auditor’s responsibilities as it relates to the considerations in the investigation of identified items. As discussed below, we request clarifications so that auditors sufficiently understand how to apply the guidance to enable consistent application in practice.

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First, we recommend providing clarity as it relates to the scope of ‘identified items’ that need further investigation, as there could be different interpretations as to the population of transactions for which the proposed AS 2301.37A considerations apply. The Release states, “Because technology-assisted analysis may enable the auditor to examine all items in a population, it is possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor. PCAOB standards should be modified to address more directly the auditor’s responsibilities in such scenarios”. We believe it is important to acknowledge that when using technology to examine 100% of a population of transactions, there may be different reasons for why items meet criteria that indicate further audit procedures are required (e.g. populations that contradicts the original risk assessment as addressed by AS 2301.46, population that represents a significant unexpected difference from expectations under AS 2305.21, or a sampling deviation under AS 2315.40). We are not clear about whether the Board intends the considerations in AS 2301.37A to apply to each item where the technology-assisted analysis indicates further audit procedures are necessary, or whether the Board agrees with our view that auditor judgment is involved in determining the items that meet the criteria for further investigation under AS 2301.37A. We believe clarifying the Board’s intent directly in the final standard is important. Furthermore, for items returned within the population that meet criteria established by the auditor and that have similar characteristics, we believe it is important to clarify that audit sampling is an allowed approach for testing the identified items, as the results can be applied to the related population of items.

Our second concern relates to how the Release describes the scope of technology-assisted analysis used by auditors for “selecting certain items for testing under PCAOB standards” to obtain audit evidence. The Release states “an auditor may establish criteria and identify and investigate specific items as part of performing a substantive procedure in response to an assessed risk of material misstatement.” This could imply that technology-assisted analysis is used only for purposes of risk assessment or identifying items for specific item testing. However, we believe it is important to clarify that technology-assisted analysis may also be able to provide sufficient appropriate audit evidence to respond to risks identified for items that meet expectations (i.e. achieve the audit objective by meeting the expectation of the procedure).

9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

As described previously, proposed AS 1105.10A(b) allows an auditor the option to test the company’s procedures by which such information is received, recorded, maintained, and processed in the company’s information systems, but what is required by the auditor to ‘test the company’s procedures’ is not clear. Given this option follows the option in proposed AS 1105.10A(b) to test controls over the company’s procedures, we are uncertain as to the Board’s intent with the option to ‘test the company’s procedures’ and how this is different than testing the company’s controls. Additionally, the statement made by Chair Williams that specifies “the proposal would require the auditor to obtain an understanding of the source of the external information and to test the company’s controls over the information”³ suggests that the proposed requirement in AS 1105.10A(b) is not intended to allow for optionality in how auditors evaluate the reliability of external information obtained from the company. This statement, along with the lack of clarity in the Proposed Amendments about what the Board expects an auditor to do if they do not test controls to evaluate reliability of external information will lead to confusion and inconsistent execution in practice. The example provided in the Release discusses “comparing the information the company provided to the auditor to information the company obtained from the external source.” Specifically in this example, how comparing to external source information achieves the requirement to ‘test the company’s procedures’ is not clear.

³ See Statement on Technology-Assisted Analysis Amendments at [Statement on Technology-Assisted Analysis Amendments | PCAOB \(pcaobus.org\)](https://www.pcaobus.org/Statement-on-Technology-Assisted-Analysis-Amendments)

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If the intent is to require an auditor to test controls to establish the reliability of external information obtained from the company in all cases, we ask the Board to consider the potential unintended consequences as laid out in our response to question 11. We suggest revising this Proposed Amendment to be consistent with the concepts of evaluating reliability in AS 1105.08 and AS 1105.10, which allows for performing procedures to test the applicable attributes of reliability or testing the company's controls over the applicable attributes of reliability.

10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

We agree with the Board's emphasis on the importance of controls over information technology in establishing reliability; however, there are instances when information can be deemed reliable when controls are not evaluated or are not deemed effective. Reliability depends on the nature and source of the evidence and the circumstances under which it is obtained. For example, a company receives a direct transactional feed from a third-party that is then uploaded into their information systems, and the auditor uses an export of the transactional information as audit evidence. If the original flat file is maintained by the company, it may be appropriate to perform audit procedures over the accuracy and completeness of the information through comparison to the original flat file without having tested controls over the conversion of the flat file data into the company's system.

Proposed Amendments to AS 1105.15 stating reliability "depends on the effectiveness of the controls," could indicate the requirement to test controls over all information used in the audit procedure, and if controls were found to be ineffective, the information could not be determined to be reliable. This appears to conflict with AS 1105.10 which allows auditors to directly test the information produced by the company for reliability. We believe that updates to AS 1105.15 should be consistent with those made in AS 1105.08, and as such we recommend the following updates:

.15 Inspection involves examining information, whether internal or external, in paper form, electronic form, or other media, or physically examining an asset. Inspection of information provides audit evidence of varying degrees of reliability, depending on its nature, source, and circumstances in which it was obtained. [Footnote 7C excluded]. ~~In addition, the reliability of information produced by the company or external information maintained by the company in electronic form is more reliable when the company's also depends on the effectiveness of the controls over that information, including, where applicable, information technology general controls and automated application controls, are effective. [Footnote 7D excluded] An example of inspection used as a test of controls is inspection of records for evidence of authorization.~~

We also recommend the Board consider modernizing AS 1105.08 since its use of 'original documents' does not account for information that may only exist in electronic form and may not be a 'document' at all. For example, when an electronic data transmission from a customer initiates a transaction in a company's ERP system, no physical or original document exists. We suggest the following edits to AS 1105.08:

.08 Evidence provided by in its original form documents, whether in hard copy or electronic form, is more reliable than evidence that has undergone conversion, copying, or other modifications from its original form provided by photocopies or facsimiles, or documents that have been filmed, digitized, or otherwise converted into electronic form, the reliability of which depends on the controls over the conversion and maintenance of that information ~~these documents.~~

11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

PCAOB standards should not require internal controls over information produced by the company and external information maintained by the company in electronic form to conclude such information is reliable

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audit evidence for reasons discussed in response to question 10. While testing internal controls is one effective method for evaluating the reliability of information, there could be other methods to evaluate reliability that provides sufficient evidence. Requiring tests of controls over all external information obtained from a company and used by an auditor, including that used only for substantive testing purposes, will likely result in companies needing to design and implement controls over such information when they otherwise would not believe such controls to be necessary because the risk related to reliability is sufficiently low. For example, few companies implement specific controls over certain types of external information, such as third-party PDFs of invoices or receiving documents or of legal agreements downloaded and maintained on an employee's computer because management has not identified a risk related to reliability necessitating such controls. If auditors were required to test internal controls to use information as audit evidence, companies would likely be forced to establish controls beyond those they are required to have in place to comply with their financial reporting and internal control over financial reporting requirements.

We believe there could be large economic impacts to both non-integrated audits and integrated audits by requiring auditors to test controls over external information obtained by a company. Non-integrated audits, not otherwise required to test controls, would now be required to bring control testing, including information system controls, into scope for the sole purpose of using this information as audit evidence. For integrated audits, control testing outside the company's internal control over financial reporting could be required to be tested and controls over all electronic information maintained by the company in electronic form would be required even if only used for audit evidence.

We also believe there are circumstances where the company may have manual controls over the external information maintained by the company in electronic form. The Proposed Amendments' use of, "including information technology general controls and automated application controls" suggests the auditor is required to test those information technology general controls and automated application controls when the company has them in place regardless of whether manual controls that achieve the same objective are in place. Audit scope limitations could arise in situations where auditors are otherwise able to test manual controls to establish reliability of information because the specific technology general controls and automated application controls required by the Proposed Amendments do not exist or are ineffective.

Economic analysis

16. Are there additional potential costs that should be considered? If so, what are they?

While employing technology-assisted analysis on audit engagements can provide significant benefits to audit quality, we do not believe a reduction in audit fees is necessarily one of the benefits given the significant research and development investment to implement and maintain technology used in the audit. Further, there are significant costs to employ appropriately skilled individuals related to data and technology. We anticipate that the use of technology-assisted analysis throughout all stages of the audit process will expand as technology continues to advance, resulting in higher technology and related employee costs that may offset the benefits discussed in the Release. Furthermore, we expect to continue to identify innovative technologies and tools, which will require additional funding for research and development, implementation, and maintenance.

We believe those costs, as well as ongoing engagement-level costs, such as preparing company data for use in a technology-assisted analysis and the use of specialized skills and knowledge in an audit, may not be modest taken together. These efforts by firms and engagement teams are investments that require continuous maintenance as technology evolves.

Effective date

24. Would requiring compliance for fiscal years beginning after the year of SEC approval present challenges for auditors? If so, what are those challenges, and how should they be addressed?

The Proposed Amendments will require changes to our audit methodology, guidance and related tools as well as training to our professionals. Once these actions are complete, engagement teams will require

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sufficient time to successfully incorporate the new requirements into the audit plan and coordinate involvement with other auditors.

Further, consistent with the Board's strategic plan, the Board has accelerated its standard-setting activity, resulting in several proposed new standards. We recommend the Board provide transparency about the expected timing of finalizing the various proposed standards and seek comment on the proposed effective dates. Without such clarity, we have limited ability to assess the aggregated efforts necessary to comply with the collective changes to the auditing standards.

Notwithstanding the forementioned, we recommend that the effective date should be no earlier than two years after the SEC's approval of the final amendments and final standard.

From: Norman Marks <nmarks2@yahoo.com>
Sent: Wednesday, June 28, 2023 7:57 AM
To: Comments
Subject: [EXT]: PCAOB Release No. 2023-004 June 26, 2023

I have just one comment to make on the draft.

I have not been able to see any guidance on using technology to test controls. I have seen where the draft states that this is a possible use, but no specific guidance on the topic. Maybe I missed it in this long document.

My point is that there is a tendency to assume that if you test the data and find no exceptions the controls are operating effectively.

That is not a sound assumption.

The auditor needs to perform procedures that confirm the existence, design, and proper operation of internal controls before relying on them.

It is unusual for technology to be able to confirm that a control exists and is properly designed.

While technology may replicate what the control is intended to do, that is not persuasive evidence that the control exists and is performed consistently as designed.

The absence of errors does not prove anything other than there are no errors.

The fact that your home has not been broken into is not proof that you closed and locked the front door every time you went out.

If there are errors, more work has to be done to determine whether they were the result of isolated exceptions or a control breakdown.

Thank you

Norman D. Marks, CPA, CRMA
Author, Speaker, Thought Leader
OCEG Fellow, Honorary Fellow of the Institute of Risk Management

Join me online: [My blog](#) | [Twitter](#) | [LinkedIn](#)

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August 28, 2023

By Email: comments@pcaobus.org

Office of the Secretary
Public Company Accounting Oversight
Board
1666 K Street, NW
Washington, DC 20006-2803

Re: PCAOB Release No. 2023-004 – Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Dear Office of the Secretary:

Mazars USA LLP (“Mazars USA”) welcomes the opportunity to comment on the Public Company Accounting Oversight Board’s (“PCAOB” or the “Board”) proposed amendments in Release 2023-004 (this “Release”) to PCAOB Auditing Standards related to aspects of designing and performing audit procedures that involve technology-assisted analysis of information in electronic form.

Mazars USA has over 100 partners and 900 professionals across the United States and is an independent member firm of the Mazars Group, an organization with over 1,200 partners and 30,000 professionals in over 95 countries around the world, and a member of Praxity, a global alliance of independent firms. As a member of an international network, we strive for continuous improvement by collaborating with our other member firms to set high standards for audit quality throughout the Mazars Group, Mazars USA has a unique perspective that may differ from our international counterparts due to the U.S. regulatory and litigation environment and variations in our client population.

Our view on the proposed amendments is driven by our position in the U.S. marketplace as a medium sized public accounting firm servicing mostly small to mid-size public and private businesses in a variety of industries and as a member firm in a global network. We are fully committed to the highest levels of audit quality in the execution of our audits and appreciate the efforts the PCAOB invested in the detailed proposal.

We support the Board's intent to modernize and strengthen auditing standards with respect to the auditor’s responsibilities for designing and performing audit procedures that involve technology-assisted analysis of information in electronic form. The auditor’s use of technology continues to become more pervasive in the current environment and we are supportive of the additional direction proposed by the PCAOB that will serve to enhance audit quality.

General Comments

Need to Improve Audit Standards

1. Mazars wishes to express its appreciation and support for the Board’s efforts to specify and clarify auditor responsibilities related to aspects of designing and performing audit procedures that involve technology-assisted analysis of information in electronic form.

2. We particularly welcome the Board's overall assertion that the incorporation of technology-assisted analysis into the auditor's audit approach is broadly intended to *"improve audit quality and enhance investor protection."* When read in conjunction with various other observations throughout the Release, the proposed amendments appear to signify a distinct move by the Board to promote the use of technology-assisted analysis. For example, the Release notes that:
- a) Audit procedures involving technology-assisted analysis are an important component of many audits;¹
 - b) Using technology-assisted analysis may enhance the effectiveness and efficiency of audit procedures.²
 - c) The proposed amendments may reduce the risk of some firms being reluctant to use technology-assisted analysis due to perceived regulatory risks;³ and
 - d) Auditing standards that do not appropriately accommodate the evolution of technology may therefore inadvertently deter or insufficiently facilitate improvements to the audit approach.⁴
3. To emphasize, based on our reading of the Release (in particular Sections I, II and III, including a sample of key observations as highlighted in paragraph 2), we broadly interpret that the proposed amendments were designed to, in simple terms, (also) improve audit quality and to serve as an incentive to promote or stimulate the auditor's use of technology-assisted analysis.
4. In contrast, we believe the level of such anticipated benefits or expectations is substantially curtailed or restricted when considering the discussions in Section IV of the Release. In discussing the economic analysis of the proposed amendments, it is noted that, inter alia, *"Overall, we expect that the economic impact of the proposed amendments, including both benefits and costs, would be relatively modest."* Needless to say, we expected that the economic impact, for both benefits and costs, would be more than modest. However, this may also mean that on average, audit firms already use technology to a large extent, and the expected incremental value of the proposals is therefore considered modest. Alternatively, this may suggest that the proposals do not sufficiently "move the needle" in respect of the auditor's use of technology.
5. Given the perceived inconsistency about the basis or rationale of the proposed amendments, including the nature and degree of the collective benefits, we encourage the Board to clarify its views or position in relation to the use of technology more broadly. For example, it would be helpful if the Board could further elaborate on the meaning and consequences of an assertion that the benefits associated with the use of technology are considered "modest." In particular, we are concerned that a forecast of "modest" benefits may inadvertently deter auditors from using technology-assisted analysis (as opposed to an objective of reducing the risk of some firms being reluctant to use such technology).
6. We appreciate the challenge that the Board faces in striking a balance between allowing and promoting the use of technology-assisted analysis, but at the same time restricting its use in undue circumstances. We wish to note that we concur with the principles-based nature of the proposed

¹ PCAOB Release 2023-004, Background, Section C – Current Practice, page 10

² PCAOB Release 2023-004, Background, Section D – Reasons to Improve Auditing Standards, page 12

³ PCAOB Release 2023-004, Research on Auditor's Use of Technology-Assisted Analysis, pages 30–31

⁴ PCAOB Release 2023-004, Research on Auditor's Use of Technology-Assisted Analysis, page 32

amendments and the decision to not require the auditor to use technology-assisted analysis. We also support the notion that technology-based tools may not always provide sufficient appropriate audit evidence, such as when the audit procedures are not designed and executed in accordance with PCAOB standards.

Types of Audit Procedures

7. We realize that the classification of audit procedures by nature and type is creating challenges in practice as the use of new technologies may involve a blend of types of audit procedures. In addition, the types of procedures described in the PCAOB standards may not fully describe the procedure being performed.
8. Given the challenges to appropriately classify audit procedures that involve technology, we understand and appreciate proposed amendments that intend to clarify, for example, the difference between analytical procedures and tests of details.
9. However, as technology continues to evolve, we would caution against an approach that is overly focused on dissecting or analyzing existing categories of audit procedures, purely for purposes of finding a category that is deemed to be the “best fit” for a particular technology-assisted analysis procedure (i.e., “shoehorning” technology procedures in accordance with potentially outdated audit procedure categories). We wish to note that the PCAOB’s long-standing categories of audit procedures,⁵ although principles-based, may not be suitable for classification or categorization of modern technology-assisted techniques.
10. We are of the view that it is more important for auditors to focus on the appropriateness of the audit procedures in the circumstances (i.e., whether the audit procedures are appropriately designed to achieve their intended purpose), rather than analyzing the type of audit procedure (i.e., in which “category” the audit procedure falls). We encourage the PCAOB to adopt a similar mindset – this may include implementing an approach where the continued applicability and relevance of potentially outdated audit principles or concepts are critically evaluated, given the rapid evolution and advances in technology. For example, when using technology-assisted analysis to perform a substantive analytical review procedure, there may be circumstances where the capability or precision of such an audit procedure provides sufficient appropriate audit evidence in response to a significant risk, without the need to supplement this procedure with test of controls or tests of details. An example may include the use of technology to perform a substantive analytical review procedure, where 100% of the interest income on loans receivable is tested or recalculated. We appreciate that such a fundamental review of audit principles is outside the scope of the current project and would take some time.

Targeted Feedback

Reasons to Improve the Auditing Standards

11. In addition to our general comments, we provide specific feedback to certain questions in this section.

Q4: Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

⁵ AS 1105, paragraph 13

12. In principle, we believe the proposed amendments to clarify the differences between tests of details and analytical procedures are clear and reasonable. However, please refer to our comments and recommendations as discussed in paragraphs 4–5 and 9–10 of this letter, in relation to:
- a) Uncertainty about whether the overall proposals are intended to encourage the use of technology-assisted analysis;
 - b) Risks about an approach that overly focuses on analyzing existing categories of audit procedures (such as tests of details and analytical procedures), including the differences between such categories, for purposes of shoehorning different types of technology-assisted analysis techniques into such categories. For example, when using data analytics to assess the population of journal entries to identify unusual/higher risk items, is this a risk assessment procedure or a substantive test?
 - c) Shifting the focus from analyzing the type of a procedure to whether it's appropriate in the circumstances.
 - d) Questioning whether there may be circumstances where existing auditing concepts or principles should be reconsidered, given the evolution and advancements in technology. For example, exploring whether a substantive analytical review procedure (involving technology-assisted analysis) may be able to provide sufficient appropriate audit evidence in response to a significant risk, without the need to supplement this procedure with test of controls or tests of details.
13. Given an expectation of more widespread use of technology-assisted analysis, including substantive analytical review procedures, we encourage the Board to recognize risks associated with circular testing. For example, two or more accounts may be co-dependent, such as sales and cost of sales. There may be risks or unintended consequences when using the data of cost of sales to predict sales and vice versa, without performing substantive tests regarding the accuracy and completeness of the data of one of the account balances.
14. In further demonstrating and clarifying the segregation between analytical procedures and tests of details, we encourage the Board to develop examples that are more elaborate or detailed, which would provide more clarity and a better understanding of the Release and would likely stimulate the use and benefits of technology-assisted analysis.

Q5: Would the proposed amendment that states that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure improve the auditor's evaluation of the relevance of audit evidence? If not, what changes should be made?

15. We believe the proposed amendment would improve the auditor's evaluation of the relevance of audit evidence, based on the assumption that paragraph 07 of AS 1105 is a required consideration by the auditor. Paragraph 07 of AS 1105 explains the factors that affect the relevance of audit evidence. The use of examples would also contribute to the understanding and application of the proposed amendment (including the example about rental properties in the Release).

Multi-purpose Audit Procedures in PCAOB Standards

Q6: Are the proposed requirements that specify the auditor's responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

16. We support the proposed revisions that specify that if an auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure to achieve each of the relevant objectives.
17. We also concur with the notion that the purpose, objective, and results of multi-purpose procedures should be clearly documented.

The Auditor's Investigation of Items when Designing and Performing Substantive Audit Procedures

Q7: Would the proposed amendments, that specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

18. We support the objective of the Board to specifically address the auditor's responsibilities regarding the investigation of items that meet a certain criteria established by the auditor. Whilst we also agree that it may improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks, we would appreciate further clarity and guidance regarding the proposed amendments included in the new paragraph AS 2301.37A. We appreciate that the amendments are intended to specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures on all or part of a population of items. However, although written in a linear manner, we have noted that the consequences of such considerations are interconnected and may vary (e.g., the nature, timing, or extent of procedures for investigating the identified items), and allow for the use of auditor's judgment.
19. For example, assume an engagement team uses an analytical tool to identify anomalies, and based on the criteria, anomalies carry risks of material misstatement. As currently drafted, the proposed amendments are not prescriptive about the auditor's response in respect of the anomalies identified and may vary based on the relevant facts and circumstances. Although we welcome the scalability element of the proposed amendments, we would appreciate methodical-type guidance that assists the auditor to consider all the alternatives more carefully and thoughtfully, which may also inform the auditor's exercise of professional judgment in determining the nature, timing and extent of procedures for further investigation.
20. The question then also arises about how to deal with or respond to items which did not meet the outlier or anomaly criteria. The Release appears to suggest that:
 - a) The auditor may "*select specific items for testing*" for lower risk items (page 22 of Release). We would appreciate guidance or clarification about whether there may be circumstances where the auditor may not be required to perform further audit procedures in relation to lower risk items.
 - b) "*The proposed amendments do not address the auditor's responsibilities over other items in the population,*" while it is also noted that the auditor would determine the nature, timing and

extent of audit procedures that are necessary to perform in accordance with existing PCAOB standards. Given an inter-connected, although non-prescriptive, approach in relation to the auditor's investigation of items that meet criteria established by the auditor, we recommend that the proposed amendments, or guidance, is extended to also address the auditor's responsibilities over other items in the population.

21. We agree with the requirement to obtain evidence to evaluate management's responses as obtaining corroboration of management explanations is key to the success of analytical and other procedures.

Q8: What other factors, if any, should the auditor consider when investigating items that meet criteria established by the auditor when designing or performing substantive procedures?

22. With reference to an example on page 22 of the Release:

In another example, as part of performing substantive procedures for raw material purchase transactions, an auditor may identify items with certain characteristics (e.g., amount, timing, or location). Investigating the identified transactions could involve examining documentary support for all the identified items where the risk of material misstatement has been assessed as higher; and for the identified items where the risk of material misstatement has been assessed as lower, the auditor may select specific items for testing.

23. The example in the Release notes that the investigation of identified transactions "could" involve examining documentary support for all the identified items where the risk of material misstatement has been assessed as higher. We would appreciate further clarity on the proposed guidance. For example:
- a) Does the Board expect circumstances where the investigation of identified transactions could involve examining documentary support for a sample of identified items, even where the risk of material misstatement for all the identified items has been assessed as higher?
 - b) Generally, our approach would require the auditor to examine documentary support for all identified items where there is a risk of material misstatement due to fraud (i.e., significant risk) for such identified items. The question arises as to whether a risk of material misstatement due to fraud automatically requires the investigation of all identified transactions? We expect this to be the case; however, we request the Board provide a clarification of such circumstances to avoid confusion and potential differences in practice.

Auditor Responsibilities for Evaluating the Reliability of Audit Evidence

Q9: Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

24. We are broadly supportive of the proposed amendments, including the assertion that the reliability of information produced by the company is increased when the company's controls over that information are effective.
25. However, we have noted that the Release notes (page 25) that the proposed amendments are designed to address the risk that "the external information maintained by the company and

provided to the auditor to be used as audit evidence may be incomplete or inaccurate (i.e., when compared with the original version that the company obtained) ...” We do not believe it’s appropriate to explicitly assert that the auditor (or the company) is in a position to address the risk of incomplete or inaccurate external information that is provided to, and maintained by, the company. Circumstances where the auditor is in a position to evaluate the accuracy and completeness of external information (including when provided to and maintained by the company) are rare, and it would be misleading to suggest otherwise. We suggest the focus is changed to the reliability of the information.

26. The introduction of paragraph 10A of AS 1105 presents similar challenges. Although we appreciate the intention to evaluate whether the *“information is reliable for purposes of the audit,”* we wish to note that the extent of the auditor’s procedures in these circumstances are often quite limited, such as considering the credibility or reputation of the third party. As such, we request the Board clarify its expectations regarding the auditor’s work effort in complying with the proposed requirements of paragraph 10A.

Q10: Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

27. We are supportive of proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence. However, we wish to note that there may be circumstances where the testing of such relevant automated controls are not required or necessary. For example, in a financial statement audit, the auditor may not be required to issue an opinion over internal controls over financial reporting, and/or the auditor may not place any reliance on the controls in question.

Economic Analysis

Q13: We request comment generally on the baseline for evaluating the economic impacts of the proposed amendments. Is there additional information regarding auditors’ use of technology-assisted analysis or are there additional academic studies that we should consider?

28. Please refer to our general comments in the introduction above. In our view the economic analysis could be enhanced:
- a) As written, the analysis appears to suggest that existing financial information and audits are “less reliable.” While we appreciate that audit quality may be enhanced through the use of technology, any suggestion that current audits or financial information are unreliable is not appropriate.
 - b) There are statements about the cost of new technology and associated methodologies (e.g., *“firms may incur relatively modest fixed costs to update their methodologies”*) which may be true for firms that have already invested in technology and the related training. There is also a suggestion that this investment is a simple one-off exercise/cost, without taking into account the rapid evolution in technology which may render current tools and training obsolete in the short to medium term.
 - c) The analysis focusses on reducing costs and, consequently, may be seen to put further downward pressure on audit fees. In our view, the focus should be on the ability of auditors

to redeploy resources to other more complex, higher risk areas of the audit which should lead to a further increase in audit quality.

We would be pleased to discuss our comments with you at your convenience.

Please direct any questions to:

- Joseph Lanza, Director, Quality & Risk Management
(Joseph.Lanza@Mazarsusa.com)
- Phil Minnaar, Director, Quality & Risk Management
(Phil.Minnaar@Mazarsusa.com)
- Wendy Stevens, Practice Leader, Quality & Risk Management
(Wendy.Stevens@Mazarsusa.com)

Very truly yours,

Mazars USALLP

Mazars USA LLP



Members of the Investor Advisory Group

Via Email

August 25, 2023

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street, NW
Washington, DC 20006-2803

PCAOB Rulemaking Docket Matter No. 52, Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form, PCAOB Release No. 2023-004.

Dear Secretary Brown and Members of the Public Company Accounting Oversight Board (PCAOB or Board):

The Members of the Investor Advisory Group (MIAG)¹ appreciate the opportunity to comment upon the PCAOB’s “Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form” (Proposal).² We agree with PCAOB Chair Erica Y. Williams that “[t]he use of technology by auditors and financial statement preparers never stops evolving, and PCAOB standards must keep up to fulfill our mission to protect investors. [This] proposal is another key part of our strategic drive to modernize PCAOB standards.”³

We understand the Proposal would amend AS 1105, *Audit Evidence* and AS 2301, *The Auditor’s Responses to the Risks of Material Misstatement*, and make conforming amendments to other related PCAOB auditing standards. These standards were issued in 2010 as part of the Board’s efforts to ensure auditors properly assess the risk of material misstatements of financial statements, whether due to errors or fraud. The development and subsequent use of various technologies have evolved dramatically over the past five decades. We agree with the

¹ This letter represents the views of Investor Advisory Group (IAG) and does not necessarily represent the views of all of its individual members, or the organizations by which they are employed. IAG views are developed by the members of the group independent of the views of the Public Company Accounting Oversight Board (PCAOB or Board) and its staff. For more information about the IAG, including a listing of the current members, their bios, and the IAG charter, see <https://pcaobus.org/about/advisory-groups/investor-advisory-group>.

² PCAOB, Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form, PCAOB Release No. 2023-004 (June 26, 2023), https://assets.pcaobus.org/pcaob-dev/docs/default-source/rulemaking/docket-052/pcaob-release-no.-2023-004-technology-assisted-analysis.pdf?sfvrsn=b801ffd0_2.

³ PCAOB Issues Proposal to Bring Greater Clarity to Certain Auditor Responsibilities When Using Technology-Assisted Analysis, (June 26, 2023), <https://pcaobus.org/news-events/news-releases/news-release-detail/pcaob-issues-proposal-to-bring-greater-clarity-to-certain-auditor-responsibilities-when-using-technology-assisted-analysis>.

Board's statement "...the use of information in electronic form and technology-based tools by companies and their auditors to analyze such information has expanded significantly since these standards were developed."

Several examples:

- Long ago, accounting systems moved from paper ledgers to computer systems. Accounting systems have since progressed to the point where substantial amounts of accessible data are now stored in the "cloud," managed by third party service providers.
- The deployment by the company of searchable databases within a company or a cloud provider has made it more efficient to identify, analyze and evaluate the significance and propriety of data for disclosure in financial reports to the investing public.
- Approximately three decades ago, audit firms began to migrate their audit processes, including supervision and management, to digital formats and systems, making it easier to interface with and gather data from the company being audited.
- During the past two decades, CPA firms have also offshored the work they perform to other countries, such as auditing procedures and income tax compliance work, sometimes for the purpose of reducing audit costs. Accomplished through the use of technology, this results in auditing challenges such as proper planning, performance, and supervision of the work, and evaluation of the results. It has raised questions with respect to how the information and evidence of results of such work are shared with the lead auditor when appropriate, and when necessary, shared with the audit committee.
- For over two decades, advances in databases and data storage have enabled the development of powerful software and hardware tools for analyzing large volumes of data. Researchers and professionals in fields like security analysis and portfolio management, whose work impacts market prices, have adopted these tools - but auditors, who could also benefit, have been slower to utilize them. We believe it is time for auditors to take advantage of these advanced data analysis tools as well. Doing so would likely improve audit quality and enhance auditors' ability to detect financial misstatements, including those resulting from fraud.

This evolution has not occurred at the same rate in all countries, and for all audit firms. It is probable it has evolved at uneven rates for different auditors, given the disparity in sizes of U.S. auditing and international firms and the resources available to them.

The PCAOB's standards should directly address the auditors' use of technology and data. This includes data from both the company being audited and other relevant external sources, and should provide appropriate guidance on obtaining sufficient, appropriate audit evidence. Such evidence should come from inside the audited company as well as external to it. The goal is to ensure auditors will leverage technology and data for their proper evaluation of the fair presentation of financial statements.

We find the principles proposed to be appropriate for the auditing literature being amended. In keeping with the Proposal's key provisions specified on page 5, we support the proposed amendments if they:

- Specify considerations for the auditor's investigation of items selected in the planning stages of the audit.
- Specify that if an auditor uses evidence for various objectives, the audit procedures must be designed in a manner that when performed, will achieve each specific objective. The audit planning documentation should support how each procedure will achieve each objective. In turn, the audit workpapers should document that the work performed achieved each objective.

- Require that external information maintained by the company and used as audit evidence by the independent auditor be appropriately evaluated to ensure it is reliable. This should also be true for digital evidence maintained outside the company and used by the auditor to support the high level of assurance provided by the audit opinion.
- Clarify the meaning and purposes of (a) tests of detail and (b) analytical procedures. The standards should note the differing levels of precision between these procedures. They should also provide guidance on when each type of procedure is relevant for assessing misstatement risks. In particular, the standards should specify when technology-assisted analytical procedures must be supplemented by further tests of detail.

We believe sound, well-reasoned auditor judgment in planning an audit is the key to its professional execution. It would improve the Proposal if this basic auditing principle were highlighted and emphasized.

When using technology-assisted audit procedures, it is vital that the auditor considers and evaluates the evidence they provide in the context of the entire audit. The Proposal asserts technology-assisted audit procedures may be used in three ways: in risk assessment procedures, tests of controls, and substantive procedures. In that context, an auditor may determine to test an entire population of data, such as 100 percent of the adjusting journal entries made throughout the year. The auditor would be remiss, however, if consideration were not given to the possibility that there were adjusting entries that had *not* been entered into the data selected for testing. Likewise, it would be unwise for an auditor to fail to gain an understanding of the internal controls that ensure the completeness and accuracy of the data.

It is important the technology used reflects the proper inputs. News accounts and enforcement actions have often reported how inputs into digital analysis tools, such as credit rating algorithms, loan loss calculations, pension obligation calculations, or even criteria for revenue recognition, did not reflect current trends or developments. It is important that a final standard emphasizes that technology-assisted tools are only as good – or bad – as the data upon which they rely. As a result, auditors' procedures should include gaining an understanding of such tools and assessing their reliability while considering current developments. We have expressed concern about possible overreliance on such methods and we have suggested that audit quality might be reinforced by addressing technology-assisted audit procedures in the PCAOB standards. We appreciate that the Board has proposed amendments to AS 1105 and AS 2301 in response to our concerns.

Finally, we note that while the PCAOB is continuing its assessment of the use of technology in audits, we strongly urge the Board to include in its final standard a requirement that auditors should use technology that has existed for decades and used by other market participants to assess and verify the accuracy and completeness of financial reports. Financial research and investment management firms have long undertaken the use of technology-based tools noted above to evaluate whether transactions were not reflected in financial statements; whether revenues reported were inflated; to seek unrecorded obligations; or to determine if asset values were inflated. For too long, the auditing profession has not kept up to date with such useful tools, nor utilized them in a timely manner.

We believe the use of currently available technologies by audit firms would benefit those firms through higher quality audits. We believe there is a proven history of such tools being used to ferret out fraud which would benefit investors – especially when fraud is detected earlier. We also believe the use of such powerful technology by the firms would be attractive and perhaps incentivize college graduates to consider accounting and auditing as a more attractive career than what the firms currently offer.

We believe the amendments discussed above will not necessarily increase the cost of audits performed. To the extent the costs increase, we believe they will be more than offset by the benefits of earlier detections of frauds, reduction in litigation costs due to higher quality audits, and reductions of inefficiencies and benefits in attracting new and talented personnel. By requiring auditors to focus on the purpose of technology-assisted audit procedures employed in an audit, we believe that more cogent and cohesive planning of audits will be realized, leading to improved gathering of evidential matter – and this should lead to higher quality audits.

Thank you for carefully considering the comments of the MIAG and other investors—the primary customers of audited financial reports. If you, any members of the Board, or your staff have questions or seek further elaboration of our views, please contact Amy McGarrity at amcgarrity@copera.org.

Sincerely,

Members of the Investor Advisory Group

Members of the Investor Advisory Group



August 28, 2023

SENT ELECTRONICALLY

Via online submission: comments@pcaobus.org

Office of the Secretary
Public Company Accounting Oversight Board
1666 K St. N.W.
Washington, DC 20006-2803

Re: PCAOB Rulemaking Docket Matter No. 052 – ***Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form (PCAOB Release No. 2023-004)***

Dear Madam Secretary and PCAOB Board Members:

Thank you for the opportunity to provide input to the Public Company Accounting Oversight Board (PCAOB) on the above noted document.

MNP LLP is one of Canada's largest chartered professional accountancy and business advisory firms. Our clients include a sizable contingent of public traded entities, including Emerging Growth Companies ("EGC"), as well as small to mid-sized owner-managed businesses, credit unions, co-operatives, First Nations, not-for-profit organizations, municipalities, and government entities. We believe that we are well-positioned to provide feedback on the proposed amendments from the viewpoint of a mid-sized firm.

We have reviewed PCAOB Release No. 2023-004 ("Release") and support the PCAOB's efforts to make changes to standards to encourage the use of technology-assisted analysis and agree that the proposed changes would increase the likelihood that the auditor obtains relevant and reliable audit evidence through audit procedures that involve technology-assisted analysis. We agree that using technology-assisted analysis may enhance the effectiveness and efficiency of audit procedures and encourage auditors to obtain a more robust understanding of the controls implemented by their clients.

However, we are concerned that the PCAOB has not appropriately considered the cost that small and mid-sized accounting firms would incur in implementing changes to use technology-assisted analysis. As explained in more detail in question 16 below, these costs could be significant and may result in audits of companies performed by small and mid-sized accounting firms to be uneconomical. We suggest more robust economic analysis is needed of the potential costs in relation to benefits as they relate to small and mid-sized firms.

In addition to our overarching concern, we have identified certain specific issues with the proposal below.

Question 1: Does the description of auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors' use of technology-assisted analysis that we should consider?

The Release states that companies use enterprise resource planning and other information systems that maintain large volumes of information in electronic form, and that significant volumes of this information are available to auditors for use in performing their audit procedures. However, clients of small and mid-sized accounting firms may rely instead on other effective processes relative to their size to manage their operations and financial reporting, and it may not be as cost-effective or effortless for their auditors to perform technology-assisted analysis. See also our comments on costs and unintended consequences under Question 16.



Question 2: Does the release accurately describe aspects of designing and performing audit procedures involving technology-assisted analysis where improvements to PCAOB standards may be necessary?

We believe it would be beneficial if the Release provided examples for small and mid-sized accounting firms to demonstrate how technology-assisted procedures have been used to perform substantive procedures. Insights from PCAOB's experience of how technology was used would benefit small and mid-sized accounting firms in identifying and selecting appropriate tools to help provide efficiencies and gain from the economies of technology-assisted analysis.

Question 13: We request comment generally on the baseline for evaluating the economic impacts of the proposed amendments. Is there additional information regarding auditors' use of technology-assisted analysis or are there additional academic studies that we should consider?

The focus in the Release is more concentrated towards U.S global network firms ("GNF") than it was on U.S non-affiliated firms ("NAFs"). It would be helpful for the PCAOB to consider and comment more specifically on the tools being used by NAFs as substantive audit procedures.

Question 16: Are there additional potential costs that should be considered? If so, what are they?

The Release states that companies may expect the engagement team to perform the audit with fewer firm resources.

We strongly urge the PCAOB to not include commentary that relates the greater use of technology-assisted analysis to lower audit fees.

We believe the Release mischaracterizes the significance of the costs to design, implement and operate technology-assisted analysis in audits performed by NAFs—the Release stipulates that the increase to fixed cost and variable cost would be modest for firms that do so. We believe that the PCAOB should revisit this statement and look at evidence from a larger sample of such firms to support their conclusion.

Firstly, there will be a learning curve for all firms, and including language that implies immediate cost reductions is unrealistic.

Secondly, while the costs of performing a significant volume of tests of details may decrease, the availability of engagement team members with appropriate competencies and experience to interpret the results may offset those costs.

Thirdly, a significant input to technology-assisted analysis is the data set used in the analysis. Obtaining reliable data on which to perform technology-assisted analysis at a reasonable cost may be more challenging than described in the Release.

Lastly, the costs could be significant for NAFs that either need to develop these tools themselves or through a contractor, or purchase the software. In addition, the cost of training team members in the appropriate use of the tool would not be insignificant. Moreover, these costs of implementation may not be able to be shared among the firm's entire client base or across service lines.

An unintended consequence of assuming lower audit fees in all cases could be to put pressure on audit fees such that some firms may choose to not implement technology-assisted analysis to avoid development and training costs. Another unintended consequence could be ineffective use of analytics if firms are pressured into adopting such tools before designing and implementing appropriate quality controls for their use, including appropriate training.

Other Comments

- We noted that link provided in footnote 38 to the Release does not work as intended as it directs us to a page that may have been moved, updated or deleted.
- As it reads currently, paragraph 25 of AS 1105 provides that specific items are those that have specified characteristics, such as key items or all items over a certain amount. This definition should be expanded due to the proposed changes to paragraph 21 of AS 1105, whereby specific items



would now also include items that are part of the auditor's investigation when the auditor has identified significant differences from expected amounts while performing analytical procedures.

- Paragraph 19 of the proposed amendment to AS 1105 *Audit Evidence* ("AS 1105") reads as "recalculation consists of checking the mathematical accuracy of information." We believe the word "checking" is not an audit procedure and should be amended to say "testing."
- Changes are needed to AS 2305, *Substantive Analytical Procedures* ("AS 2305) to reflect that when an auditor is performing a test that has dual objectives, such as when a test is being performed as a risk assessment procedure and as a substantive analytical procedure, the auditor should choose the objective that will result in the greatest precision in the analytical procedure. This will make AS 2305 consistent with paragraph 44 of AS 2315, *Audit Sampling*, which provides that "the size of a sample designed for dual purposes should be the larger of the samples that would otherwise have been designed for the two separate purposes."
- Clarity and guidance is also needed for how sample size will be impacted under AS 2315 when the other substantive tests directed toward the same specific audit objectives comprise analytic procedures performed using technology-assisted procedures in order to promote consistency in practice. It will encourage auditors to appropriately take into account their use of technology-assisted analysis when determining the nature and extent of other substantive procedures required to obtain sufficient appropriate audit evidence.
- Paragraph 10A of the proposed amendment to AS 1105 requires the auditor to obtain an understanding of the source of information and test controls over company's procedures by which such information is received, recorded, maintained and processed in the company's information systems, in cases when an auditor is provided with information that the company received from one or more external sources and maintains in its information systems in electronic form. The Release does not acknowledge the fact that some clients of small and mid-sized firms may not have implemented controls that can be tested. As such, it may not be possible for small and mid-sized firms to use technology-assisted procedures on their clients' data. This would put a bigger cost burden on some small and mid-sized firms as their starting point may not be from a baseline of controls or ICFR testing.

We would be pleased to provide the PCAOB with any additional information you may require regarding our comments above to assist in finding solutions that meet the needs of the financial statement users and investors.

Yours truly,

MNP LLP

Dana Ray

Dana Ray, CPA, CA

Partner, Assurance Professional Standards Group



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August 23, 2023

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street, NW
Washington, D.C. 20006-2803

Via email: comments@pcaobus.org

Re: PCAOB Rulemaking Docket Matter No. 052 – Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

Dear Members of the Public Company Accounting Oversight Board (PCAOB):

The National Association of State Boards of Accountancy (NASBA) appreciates the opportunity to comment on the PCAOB's Proposing Release, *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (Proposal).

Founded in 1908, NASBA serves as a forum for the nation's Boards of Accountancy (State Boards), representing fifty-five jurisdictions. NASBA's mission is to enhance the effectiveness and advance the common interests of the State Boards that regulate all Certified Public Accountants (CPAs) and their firms in the United States and its territories, which includes all audit, attest and other services provided by CPAs. State Boards are charged by law with protecting the public.

In furtherance of that objective, NASBA offers the following comments.

General Comments

NASBA commends the PCAOB for their continued efforts to modernize and strengthen auditing standards, including those related to the use of information in electronic form and technology-based tools. As noted in the Proposal, a substantial amount of time has transpired since the standards were issued by the PCAOB and advancements in technology have enabled auditors to expand the use of technology-assisted analysis in audits.

Both the International Auditing and Assurance Standards Board (IAASB) and the Auditing Standards Board (ASB) of the AICPA have updated or are in the process of updating their audit evidence and risk assessment standards. Leveraging the work performed by other standard setters and making standards uniform wherever possible helps avoid confusion and potential

misapplication by the CPA and aids in enforcement from a regulatory perspective. Consistency among standard setters is in the public interest.

Monitoring

NASBA supports this initiative and believes the clarifications in the Proposal will be helpful to auditors in designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools.

We believe that the PCAOB should monitor the impact of the implementation of these standards to ensure that they do not serve as a deterrence or reduction in their use. The use of these powerful technology-based tools in audits, when used appropriately, can be impactful in reducing audit risk and audit failures – which benefits the public.

Effective Date

The Proposal states that the PCAOB is considering whether compliance with the adopted amendments should be required for audits of fiscal years ending on or after June 30 in the year after approval by the SEC.

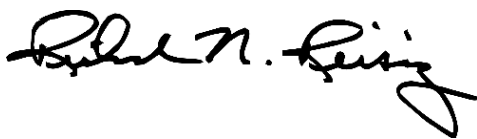
We are concerned that, depending on the approval date by the SEC, the effective date may be too soon to allow auditors to update methodologies, provide appropriate training and effectively implement the standards. Inspection teams also need to be considered in developing implementation time horizons. Inspection teams will also need ample time for updating methodologies and providing appropriate training to team members. Effective implementation of standards is in the public interest.

Special Consideration for Emerging Growth Companies (EGC)

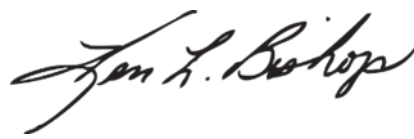
While the risk profile of an EGC is different from more mature entities, we agree that the Proposal should apply to EGCs. To exclude EGCs from the Proposal would be inconsistent with protecting the public interest.

Again, we appreciate the opportunity to comment on the Proposal.

Very truly yours,



Richard N. Reising, CPA
NASBA Chair



Ken L. Bishop
NASBA President and CEO



Aug. 28, 2023

Erica Y. Williams, Chair, Public Company Accounting Oversight Board
Office of the Secretary
PCAOB
1666 K Street, NW
Washington, DC 20006-2803
comments@pcaobus.org

Re: PCAOB Rulemaking Docket Matter No. 052

Dear Ms. Williams:

The Accounting & Auditing Steering Committee (the committee) of the Pennsylvania Institute of Certified Public Accountants (PICPA) appreciates the opportunity to provide feedback on the *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*. The PICPA is a professional CPA association of about 20,000 members working to improve the profession and better serve the public interest. Founded in 1897, the PICPA is the second-oldest CPA organization in the United States. Membership includes practitioners in public accounting, education, government, and industry. The committee is composed of practitioners from both regional and small public accounting firms and members serving in financial reporting positions. The committee's comments are included below.

- Question 3. In addition to the proposed amendments, what other requirements may need to be included in PCAOB standards to address the use of technology-assisted analysis in audits?

The proposed amendments focus on procedures in which “the auditor establishes and uses criteria to identify items for further investigation (Proposed AS 2301.37A). For example, an auditor may identify balances or transactions that contain a certain characteristic or that are valued outside of a range (FN 17A). Some committee members believe further clarification could be helpful with respect to the use of technology-assisted analysis in substantive testing. For example, using audit data analytics in internal controls or matching for a test of details not “establishing and using criteria to identified items for further investigation” (e.g., three-way match of sales invoices, shipping documents, and a master prices list). Other committee members say the existing standards were sufficient in this area. If additional guidance is not provided, the committee requests supplemental materials that illustrate the use of these techniques.

Additionally, audit software applications are evolving to incorporate risk assessment tools that are generated by artificial intelligence (AI). The committee questions whether/when PCAOB standards will permit the use of such tools. If the PCAOB believes that these tools currently are permitted, the committee requests additional clarification and detailed guidance.



- Question 4. Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

The proposed guidance makes it harder to get a test to qualify as a substantive test based on how much follow-up work is done. The committee believes that the proposed requirements are unnecessarily nuanced between a substantive and analytic test based on how much follow-up on an analytic procedure is necessary before it is considered a substantive test.

- Question 9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

The explanatory materials (page 24) refer to examples of using large volumes of information provided by the company that the company received from external sources in electronic form. The committee suggests including examples of such information to help clarify the intent.

- Question 10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

The committee believes that these amendments are clear and appropriate.

- Question 11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

The committee believes that this depends on facts and circumstances. A blanket requirement to test controls is not appropriate. For example, it is not always feasible to test controls over certain vendor or customer inputs, and the requirement to test controls should vary based on the risk and the type of evidence needed.

- Question 12. Are the proposed amendments that update certain terminology in AS 1105 clear and appropriate? If not, what changes should be made?

The updated terminology appears appropriate.

- Question 16. Are there additional potential costs that should be considered? If so, what are they?



The committee notes that firms will need to spend time researching various tools and performing due diligence to ensure compliance with their quality control systems. Once a solution is selected, staff will need to be trained.

Additional costs include the amount of effort obtaining the data in a format that can be used by the software solution, including maintaining data security, confidentiality and integrity. This can be a significant cost, and the committee notes that this is sometimes a barrier to using data analytics on an audit. The proposed standard includes additional procedures that would need to be performed in order to use the data. While the committee agrees with these additional procedures, they do represent an additional cost to using technology tools on an audit.

While lower audit fees are listed as a benefit under page 40, the committee does not believe that the costs of performing the audit will decrease with the use of technology. Instead, the auditor will simply be more equipped to address the increasing risks presented by clients' use of technology.

We appreciate your consideration of our input to the *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*. We are available to discuss any of these comments with you at your convenience.

Sincerely,

A handwritten signature in black ink that reads "Rebecca Walck". The signature is written in a cursive, flowing style.

Rebecca Walck, CPA
Chair, PICPA Accounting & Auditing Steering Committee

From: John Prendergast <johnfprendergast@gmail.com>
Sent: Monday, July 24, 2023 2:49 PM
To: Comments
Subject: [EXT]: Proposed ideas on Dockets 051 & 052

The proposed revisions place an appropriate level of attention on learning about a company's compliance and ethics program. But they do so without ever **requiring** the auditors to communicate directly with the chief compliance officer. While many auditors already do this as a matter of practice, this could be explicitly stated in the standards, so that auditors receive the most accurate information from the correct source.

First, at various points throughout the standards, auditors are directed to make inquiries about compliance with the audit committee, management, the internal audit function (see AS 2405.06a), and in-house legal counsel (see AS 2110.57d). But nowhere does it **require** auditors to speak with the person in charge of compliance. A critical step in drawing important conclusions about the compliance program's ability to prevent, identify and investigate compliance issues should involve speaking with the person(s) who has direct responsibility for the program. The standard (AS 2110.57) refers to making inquiries of "others" likely to have knowledge about instances of noncompliance. Why not require auditors to make this inquiry with the head of compliance?

In one section of the standards (AS 2110.56c), PCAOB begins a requirement with "If the company has an internal audit function,.....". Similar language could be used with respect to this inquiry of the chief compliance officer.

The two most important places in the proposed standards where this inquiry of the chief compliance officer should be addressed are in AS 2405.06a.(3) and AS 2110.57.

Second, on a related matter, the proposed standard's guidance on inquiries of the audit committee (See AS 2110.56b(5)) states that auditors should ask about how the committee exercises oversight of the fraud risk assessment process, but it does not ask about compliance risk oversight. As we all know, an audit (or other) board-level committee should have responsibility for oversight of the compliance and ethics program. Accordingly, to adequately evaluate how a company manages compliance risk, auditors should ask the audit committee about its oversight of the compliance and ethics program, too.

Thank you.

-jp, 04843



August 28, 2023

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street, N.W.
Washington, DC 20006-2803

RE: PCAOB Release No. 2023-004, *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*

Dear Madam Secretary:

We appreciate the opportunity to comment on the Public Company Accounting Oversight Board's (PCAOB or the "Board") *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (the "proposal" or the "proposing release").

Support for proposal

We commend the PCAOB on taking this first step to modernize its standards in light of the evolving and increasing use of technology by auditors in today's environment. Audits are becoming more data-driven and many firms like ours are developing and leveraging automated tools and techniques, which can benefit audit quality. As such, we support the PCAOB's efforts to address this evolution in practice through principles-based requirements and additional guidance where appropriate.

We appreciate the PCAOB's outreach on this topic prior to the release of the proposal which, as noted in the proposing release, was conducted with a wide range of stakeholders, including audit firms, investors, academics, preparers of financial statements, and members of the PCAOB Data and Technology Task Force. We also appreciate the outreach performed with the previous Standing Advisory Group (SAG), as well as the current PCAOB Investor Advisory Group (IAG) and Standards and Emerging Issues Advisory Group (SELAG).

Areas where further clarification or guidance is needed

While we support the overall direction of the proposal, there are certain areas where further clarification or guidance may be helpful to align requirements to the risk assessment framework in the PCAOB's standards and drive consistent interpretation and execution. Our views take into account how we are performing technology-assisted analysis today and how we presently envision its use may evolve in the future as more data becomes available.

External information in electronic form

It is important for auditors to consider the relevance and reliability of information to be used as audit evidence, including both external information maintained by the company in electronic form and other external information that may be used as evidence by the auditor (e.g., as an input to a technology-assisted analysis). We acknowledge the PCAOB's intent to "address the risk that the external information

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maintained by the company and provided to the auditor to be used as audit evidence may be incomplete or inaccurate (i.e., when compared to the original version that the company obtained) or that a company may otherwise modify the external information before providing it to the auditor.”¹

Nevertheless, we are concerned with the scope of the proposed requirement in paragraph .10A of Auditing Standard (AS) 1105, *Audit Evidence*, related to evaluating the reliability of external information maintained by the company in its information system in electronic form. We believe the requirement in paragraph .10A(a) to obtain an understanding of “the company’s procedures by which such information is received, recorded, maintained, and processed in the company’s information systems” is not practicable or necessary in all circumstances. The nature and extent of controls a company may have over what we believe is a wide variety of external information may vary significantly — and these controls are not necessarily part of a company’s information system relevant to financial reporting² or internal control over financial reporting (ICFR) depending on the circumstances. Additionally, the intent of certain terms in the requirement are unclear:

- “Information regarding” a purchase order or cash received in proposed footnote 3B to the requirement — it is not clear if this is referring to cash receipts data where the cash has been applied to customer invoices in the company’s detailed bank statements that is maintained in the company’s enterprise reporting system (ERP) system, the electronic data files received from the bank from the lockbox with cash receipt information, wire transfer information, information received through an EDI feed, or something else.
- “Test the company’s procedures discussed in subpart (a) of this paragraph” — this phrase is not used elsewhere in PCAOB standards. We believe this is intended to mean auditors may evaluate the reliability of the information by performing substantive procedures, which we believe is necessary as controls over external information may not exist or be formalized notwithstanding adequate procedures in place for financial reporting purposes as well as a company’s maintenance of its books and records.

To illustrate, auditors may use technology-based tools to match revenue transactions with subsequent cash receipts. The auditor may use bank statements provided by the company in PDF format as inputs to the tool. A company may not have formal controls over the maintenance of bank statements it provides to the auditor as the company is unlikely to consider these documents to be part of its information system relevant to financial reporting. The company may also only receive the bank statements in electronic form (e.g., as part of a source data file). We do not believe it would be practicable or necessary to suggest the auditor would need to understand how the bank statements are received, recorded, maintained and processed and test the company’s controls or procedures (if any) as contemplated by paragraph .10A(a)-(b). Rather, the reliability of the cash receipts data would be considered by other testing, such as procedures to validate that (1) cash received was from a bona-fide customer or expected payor, (2) the cash receipt and/or credit memo (as applicable) was applied as directed by the customer, and (3) the cash receipt is traced to a deposit in the company’s bank statement, and would be further supported by bank confirmation procedures. The nature and extent of this testing would also take into account the auditor’s assessment of the risks of material misstatement due to fraud. Accordingly, we believe a principles-based requirement related to evaluating the reliability of information is necessary to promote scalability.

¹ PCAOB Release No. 2023-004, *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*, page 25.

² As addressed in AS 2110, *Identifying and Assessing Risks of Material Misstatement*, paragraph .28.



Additionally, auditors may use information from external sources as inputs in a technology-assisted analysis that are not maintained in the company's information systems; however, this is not addressed in the proposal. We suggest the PCAOB address information obtained directly from external sources and provide guidance that auditors should exercise professional judgment about the procedures performed to evaluate the relevance and reliability of information to be used as audit evidence, depending on the nature of that information and how it is used in the audit. We offer drafting suggestions to proposed paragraph .10A of AS 1105 in the appendix to this letter.

Classification of procedures as tests of details or substantive analytical procedures

We support the PCAOB's intent in clarifying the differences between a test of details and a substantive analytical procedure, and believe providing a description of a test of details may help illustrate how technology-assisted analysis is addressed by the PCAOB's standards.

Certain procedures using technology-assisted analysis are performed at an individual item level for all items in a population but, depending on the precision of the test, differences from what management has recorded may reasonably be expected at an individual item level similar to what would be expected in aggregate for a substantive analytical procedure. Accordingly, certain analyses performed in practice today may exhibit characteristics of both types of procedures. We support allowing for auditor judgment as to whether a procedure is a test of details or a substantive analytical procedure as defined by PCAOB standards. We believe that procedures performed using technology-assisted analysis, regardless of whether they are defined as tests of details or substantive analytical procedures, if performed at an appropriately disaggregated level and appropriately designed to address the risk at the assertion level, could be sufficient to address significant risks of material misstatement.³

For example, performing a technology-assisted analysis to test 100% of a population provides audit evidence about the population akin to a more traditional test of details. When technology-assisted analysis is used in this way, it is often done as part of a comprehensive testing strategy to address a financial statement line item. We believe it is important for auditors to be able to exercise professional judgment in evaluating the audit evidence obtained from using technology-assisted analysis, including whether such evidence is sufficient and appropriate to respond to the assessed risks of material misstatement at the assertion level. This judgment includes how auditors determine what represents a misstatement when items are identified for further investigation (often referred to as "notable items" or "outliers"). The auditor may take into account the precision of the analysis (e.g., when differences are reasonably expected), as well as the materiality of the differences. In practice, auditors obtain an understanding of why notable items or outliers have occurred to assess whether further procedures are necessary in order to determine whether a significant account is materially misstated (which may include assessing whether these items are in line with the auditor's expectations as to why there would be differences). Depending on the nature of the technology-assisted analysis and the other procedures performed (including tests of controls and substantive audit procedures), the auditor may ultimately conclude that the risk of material misstatement is reduced to a sufficiently low level without performing additional substantive audit procedures.

We believe this is the PCAOB's intent in including new paragraph .37A(c) in AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, which would require the auditor to consider whether the

³ Paragraph 9 of AS 2305, *Substantive Analytical Procedures*, notes that "For significant risks of material misstatement, it is unlikely that audit evidence obtained from substantive analytical procedures alone will be sufficient."



identified items represent a misstatement or indicate a deficiency in the design or operating effectiveness of a control. We agree with the PCAOB's decision not to prescribe the nature, timing, or extent of procedures for investigating the identified items. However, we believe this could be clarified in the requirement, and have suggested edits in the appendix to this letter.

Circumstances in which no items meeting auditor-established criteria are identified

In accordance with the proposed requirement in paragraph .37A of AS 2301, a scenario could arise in which the auditor is able to test 100% of the population using technology-assisted analysis, and no items are identified that meet the criteria established by the auditor (e.g., a 3-way match does not result in any notable items). If the auditor designed the procedure appropriately to address the relevant assertion at an appropriate level of disaggregation (in accordance with paragraph .07 of AS 1105), and tested controls over the accuracy and completeness of the information produced by the company, including, where applicable, information technology general controls and automated application controls (in accordance with paragraph .10 of AS 1105), no additional testing would be expected on the population. In the case of a significant risk account, no further procedures would need to be performed as the analysis would be classified as a test of details and the analysis performed (the successful execution of the technology-assisted analysis with no notable items) would provide sufficient appropriate audit evidence.

If this is not the PCAOB's intent, we believe further clarification is necessary, including expectations related to the nature, timing, and extent of procedures performed to evaluate data reliability as part of the auditor's overall requirement to obtain sufficient appropriate audit evidence to address the assessed risks of material misstatement. For example, it may be beneficial for the PCAOB to acknowledge in the release text of the final standard or authoritative guidance that there is a spectrum of risk to be considered when assessing data reliability and for applying auditor judgment in accordance with paragraphs .07-.09 of AS 1105 and paragraph .16 of AS 2305. In our view, the level of effort needed to assess data reliability should be based on the auditor's judgment of risk related to the data, which includes consideration of the source of the data, type of audit procedure being performed, level of desired assurance, and nature of account, among other considerations. This is consistent with the PCAOB's view in the accompanying release to AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements*, that "the determination of the data to be tested—and the nature, timing, and extent of that testing—should be based on and responsive to the assessed risks of material misstatement."⁴

Holistic approach to addressing the impact of technology in PCAOB auditing standards

Consider if classification of procedures in the standards remains appropriate

We support the PCAOB's clarification about the differences between tests of details and analytical procedures. We believe this is a helpful amendment to current standards that will provide clarity and help drive increased consistency in practice. However, as technology continues to evolve, we encourage the Board to monitor whether distinguishing between specific classifications of procedures across its standards remains necessary.

The standards today have distinct categories of procedures: risk assessment procedures or further audit procedures, which consist of tests of controls or substantive procedures (further classified as tests of

⁴ PCAOB Release No. 2018-005, *Auditing Accounting Estimates, Including Fair Value Measurements, and Amendments to PCAOB Auditing Standards*, page A3-18.



details or substantive analytical procedures).⁵ There are requirements in the standards that are driven based on how a procedure is classified. For example, for significant risks of material misstatement, the standards explain that it is unlikely that audit evidence obtained from substantive analytical procedures alone will be sufficient.⁶ As technology continues to evolve and auditors develop innovative techniques to plan and perform audits, procedures may become more difficult to fit into specific classifications as we note above. Placing auditor focus on the classification of procedures may not be as impactful to audit quality as a broader focus on the sufficiency and appropriateness of audit evidence obtained from performing procedures. As such, a shift away from the strict classifications in the standards, in our view, is worth exploring.

Broader consideration of technology and its impact on the audit

While we appreciate the Board's first step to provide a foundation in the standards related to the use of technology-assisted analysis, we believe technology will need to be an ongoing focus for the Board in its standard setting given the evolving nature of technology — and that broader change may ultimately be needed to take a more holistic approach to embedding considerations relating to management and auditors' use of data and technology into the suite of standards. We encourage the Board to be bold in its considerations in this area, although we recognize the need to acknowledge that more traditional techniques may continue to be employed depending on the facts and circumstances of the engagement and its auditor. As the Board tackles issues related to the use of technology, the challenge will be to strike a balance between modernizing the audit standards to be fit for purpose, acknowledging and giving appropriate recognition to how technological auditing techniques can support obtaining audit evidence, and avoiding requirements that inadvertently inhibit innovation.

Specific observations related to artificial intelligence (AI)

We were pleased to see AI as a topic at the recent SEIAG meeting and agree with the issues that were raised in that discussion. We support exploration of this topic on a priority basis as part of the PCAOB's Data and Technology research project. We encourage the PCAOB to consider the feedback received at the SEIAG meeting, and continue stakeholder outreach to determine if it is appropriate to amend auditing standards or provide guidance to auditors to address risks of material misstatement and support audit quality in this area.

Consider the interplay with other PCAOB standard-setting projects

We recommend the PCAOB consider this project in tandem with other projects on its standard-setting agenda to promote a cohesive, holistic approach and to clearly set out how the proposals are interconnected, including its projects to address substantive analytical procedures, updates to AS 2401, *Consideration of Fraud in a Financial Statement Audit*, and quality control. While the proposal states that it does not address the evaluation of the appropriateness of tools by the firm's system of quality control, we believe that it will be important for the PCAOB and audit firms to consider the interaction between proposed QC 1000, *A Firm's System of Quality Control*, and the technology-assisted analysis proposal, particularly as it relates to documentation about the purpose and objective of using a tool at the engagement level in the audit documentation. We believe it would be helpful for the Board to provide guidance explaining how the Board intends proposed QC 1000 and this proposal to interact.

⁵ AS 1105, paragraph 13.

⁶ AS 2305, paragraph 9.



Effective date

Assuming SEC approval in 2024, we recommend that the final standard be effective no earlier than for audits with fiscal years beginning on or after December 15, 2025 to allow sufficient time for audit firms to make the necessary updates to their methodology, training, and tools.

* * * * *

We appreciate the opportunity to provide input on the Board's proposal and would be pleased to continue a dialogue with the Board and its staff. Please contact Brian Croteau at brian.t.croteau@pwc.com regarding our submission.

Sincerely,

A handwritten signature in cursive script that reads "PricewaterhouseCoopers LLP".

PricewaterhouseCoopers LLP



Appendix

Drafting suggestions

AS 1105, *Audit Evidence*

Evaluating the Reliability of External Information Used as Audit Evidence Maintained by the Company in Electronic Form

.10A The company may provide to the auditor information that the company received from one or more external sources and maintained in its information systems in electronic form,^{3B} or the auditor may obtain information directly from external sources.^{3C} When using such information as audit evidence, the auditor should ~~evaluate whether the information is reliable for purposes of the audit by performing procedures to:~~

- a. Obtain an understanding of the source of the information and, where necessary, the company's procedures over such information is received, recorded, maintained, and processed in the company's information systems, and
- b. Based on that understanding, design and perform procedures to evaluate whether the information is reliable for purposes of the audit.

~~Test controls (including information technology general controls) over the company's procedures discussed in subpart (a) of this paragraph or test the company's procedures discussed in subpart (a) of this paragraph.~~

Note: The nature, timing, and extent of procedures regarding the reliability of information obtained by the company or the auditor from external sources depends on how the information will be used in the execution of an audit procedure and the risks of material misstatement that are being addressed by the procedure. These procedures may include testing controls over the company's procedures discussed in subpart (a) of this paragraph, or performing procedures to otherwise obtain evidence about the reliability of such information (which may be done in conjunction with other procedures to respond to the assessed risks of material misstatement). The auditor may not be able to evaluate the completeness and accuracy of information obtained from an external source to the same degree as the auditor would evaluate the completeness and accuracy of information produced by the company as contemplated by paragraph .10.

^{3B} For example, information regarding a purchase order submitted to the company by a customer or regarding cash received by the company from a customer as payment for an invoice.

^{3C} For example, auditors may obtain interest rate information from the US Department of Treasury, which provides statistics specifically relating to daily treasury yield curve rates, daily treasury real yield curve rates, daily treasury bill rates, daily treasury long-term rates and extrapolation factors, and daily treasury real long-term rate averages.



AS 2301, The Auditor's Responses to the Risks of Material Misstatement

Substantive Procedures

- .37A When the auditor establishes and uses criteria to identify items for further investigation,^{17A} as part of designing or performing substantive procedures, the auditor's investigation should consider whether the identified items:
- a. Provide audit evidence that contradicts the evidence on which the original risk assessment was based;
 - b. Indicate a previously unidentified risk of material misstatement;
 - c. Represent a misstatement or indicate a deficiency in the design or operating effectiveness of a control; or
 - d. Otherwise indicate a need to modify the auditor's risk assessment or planned audit procedures.

Note 1: Inquiring of management may assist the auditor with this consideration. The auditor should obtain audit evidence to evaluate the appropriateness of management's responses.

Note 2: The nature, timing, and extent of procedures for investigating the identified items is a matter of professional judgment and depends on factors such as the materiality of the identified items, including whether they are clearly trivial, and whether it is possible to investigate items in the aggregate (e.g., because they represent a homogeneous population).

^{17A} For example, an auditor may identify balances or transactions that contain a certain characteristic or that are valued outside of a range.

From: Mark <mark.reger.cpa@gmail.com>
Sent: Monday, June 26, 2023 3:40 PM
To: Comments
Subject: [EXT]: PCAOB Rulemaking Docket 052: Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form

In the earliest days of the adoption of new automated technics to aide the creation and validation of financial transactions audit firms announced abilities to no longer rely on sample testing but to be able to test 100% of records for potential errors. Customers asked about the use of this new technology because while everyone might want to incorporate this level of control and analysis in their own record keeping system it seemed counter productive to have public accounting firms audit financial statements to a greater standard than “reasonably accurate”. Handing a management team of an auditee of hundreds of potential errors all of which do not pierce the veil of materiality will only increase the likelihood that firms would stop doing audits. If our goals are to increase audit coverage the technology should be used to support the adoption of AI to replace the most costly element of an audit by doing the recommended audit verifications within sample requirements and perhaps to ensure the capture of all material transactions but validating immaterial items is a complication and expense beyond the goals of most firms.

Sent from [Mail](#) for Windows



RSM US LLP

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August 25, 2023

Office of the Secretary
Public Company Accounting Oversight Board
1666 K Street NW
Washington, D.C. 20006-2803**Re: Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form**

Dear Office of the Secretary:

RSM US LLP (RSM, “we”) values the opportunity to offer our comments on the Public Company Accounting Oversight Board’s (PCAOB, Board) *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (the proposal, the release). RSM is a registered public accounting firm serving middle-market issuers, brokers, and dealers.

Overall Comments on the Proposal

We support the Board’s strategic goal to modernize the auditing standards, and we believe this proposed standard appropriately works towards that goal. Technology-assisted analysis is an important aspect of financial statement audits and will continue to gain more significance as technology evolves.

We are supportive of several of the proposed amendments. We believe they add clarity and modernize the standards to be aligned with current and anticipated future practice. For example, we believe current practice is aligned with the requirements regarding the level of disaggregation or detail of information, and we believe the clarified distinction between tests of details and analytical procedures is beneficial.

We believe that amendments to other topics addressed in the proposal (such as the selection of specific items for testing, the auditor’s responsibilities when using audit evidence from an audit procedure to achieve more than one purpose, and testing the reliability of information used as audit evidence) are warranted, but some of the amendments in the proposal on these topics remain unclear, or in some cases could cause a significant undesirable change to current practice.

We believe principles-based and nimble auditing standards give auditors the tools they need to perform the most effective and efficient audits, regardless of the size of the firm or complexity of the issuer. For this reason, we acknowledge and appreciate that the proposal does not require the use of technology-assisted analysis. We strongly support this position, suggest explicitly stating this in the standards and emphasize the importance of the standard being enforced as such. For the same reason, we have concerns related to the proposal that appears to require testing internal controls over the reliability of external information maintained by the company in electronic form that is used as audit evidence. We believe this is too prescriptive and inappropriate for reasons we describe in further detail in our response to question 9.

To complement principles-based auditing standards and achieve the highest level of audit quality, we believe relevant, practical examples and best practices provide valuable implementation support, and we therefore request the Board provide such examples in the adopting release and staff guidance.

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We provide further detail on these areas, as well as other comments, in our responses to certain of the Board's specific questions set out below. In certain areas, we propose specific revisions to the proposed standards. Language recommended for deletion is ~~struck through~~. Language recommended for addition is underlined.

Comments on Specific Questions Posed by the Board

1. Does the description of auditors' use of technology-assisted analysis in designing and performing audit procedures accurately depict the current audit practice? If not, what clarifications should be made? Are there other aspects of auditors' use of technology-assisted analysis that we should consider?

The description of current audit practice in the proposal¹ is generally accurate from our perspective. Information in electronic form and technology-based tools are becoming more widely available. Our engagement teams use technology-assisted analysis primarily for identifying and assessing risks of material misstatement but are expanding its use to include responding to risks of material misstatement.

4. Are the proposed amendments that clarify differences between tests of details and analytical procedures clear and appropriate? If not, what changes should be made to them?

We support the undertaking to clarify the differences between tests of details and analytical procedures. The proposed amendments to AS 1105.13 are clear and appropriate.

Further, we believe an important distinction between analytical procedures and tests of details is that analytical procedures involve developing expectations. This is explicitly stated in AS 2110.48 and AS 2305.05. While AS 1105.21 alludes to this, we believe adding it as an explicit statement in this paragraph would be beneficial and further clarify the distinction between analytical procedures and tests of details. Our proposed amendments to AS 1105.21 to incorporate this distinction and other clarifications are as follows:

.21 Analytical procedures consist of:

- a. developing expectations about plausible relationships among the data to be used in the procedure¹¹;
- b. evaluating ~~evaluations of~~ financial information in comparison to expectations; and ~~made by an analysis of plausible relationships among both financial and nonfinancial data that can be external or company-produced.~~ Analytical procedures also encompass the
- c. investigating ~~investigation of~~ significant differences from ~~expectations-expected amounts.~~

Unlike tests of details, analytical procedures generally do not involve evaluating individual items included in an account or disclosure, unless those items are part of the auditor's investigation of significant differences from expected amounts.⁴⁴¹²

¹¹ Data to be used in analytical procedures may consist of both financial and nonfinancial data and can be company-produced or from sources external to the company.

⁴⁴¹² Paragraphs .46-.48 of AS 2110, establish requirements regarding performing analytical procedures as risk assessment procedures. AS 2305, *Substantive Analytical Procedures*, establishes requirements regarding performing analytical procedures as substantive procedures.

¹ Page 11 of the proposing release

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Paragraphs .05-.09 of AS 2810, *Evaluating Audit Results*, establish requirements regarding performing analytical procedures in the overall review of financial statements.

Additionally, we recommend amending footnote 9 of AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, to refer to AS 1105.13 and adding the same footnote to AS 2301.36.

5. Would the proposed amendment that states that the relevance of audit evidence also depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure improve the auditor's evaluation of the relevance of audit evidence? If not, what changes should be made?

We do not expect the proposed amendments to AS 1105.07 to affect current practice regarding the auditor's evaluation of the relevance of audit evidence because the level of disaggregation or detail of information is generally already considered by auditors. We believe the proposed amendments to AS 1105.07 are generally clear and appropriate as written.

We find the example regarding testing the valuation assertion of residential loans to be beneficial.² We encourage the Board to consider adding this example as a note in AS 1105.07.

6. Are the proposed requirements that specify the auditor's responsibilities when using audit evidence from an audit procedure to achieve more than one purpose clear and appropriate? If not, what changes should be made to the amendments?

We agree with the intention of the proposed amendments to AS 1105.14 to require audit evidence to achieve the relevant objectives of each procedure for which it is used. However, we have some questions, suggestions and concerns with the amendments as written.

First, the documentation expectations described in the release are not made sufficiently clear in the proposed amendments. The release states, "The purpose, objective, and results of multi-purpose procedures should be clearly documented." Since "purpose" and "objective" are listed separately here, it is unclear whether an "objective" of an audit procedure is separate and different from the "purpose" of an audit procedure. Additionally, it is unclear whether there are any incremental documentation expectations in comparison to current practice. We believe current practice reflects the Board's intentions of these amendments, and it would be beneficial for auditors to understand whether this is true.

Second, we recommend clarifying the proposed amendment as follows:

.14 Paragraphs .15-.21 of this standard describe specific audit procedures. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure. If the auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform each ~~the~~ procedure to achieve each of the relevant objectives.^{7B}

7. Would the proposed amendments, that specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures, improve the identification and assessment of the risks of material misstatement and the design and implementation of appropriate responses to the assessed risks?

We have several questions about proposed AS 2301.37A and therefore cannot speak as to whether it would improve the identification and assessment of risks of material misstatement or the design and

² Page 17 of the proposal

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implementation of appropriate responses to assessed risks. Overall, we believe the selection of specific items is an area where additional guidance is warranted, but we do not believe AS 2301.37A is sufficient, clear, or in the appropriate place in the standards. We describe our questions and concerns regarding proposed AS 2301.37A below.

First, the phrase “When the auditor establishes and uses criteria to identify items for further investigation” is not sufficiently clear, even with consideration of footnote 17A. This language is not used elsewhere in the standard, so it is unclear to what this is referring. Section III.C of the release indicates this is referring to selecting specific items as prescribed by AS 1105.25-.27. If that is the Board’s intention, we suggest revising the proposed amendment to clarify this by using the same terminology. Additionally, “further investigation” is only used twice in all PCAOB Auditing Standards.³ Those instances do not relate to selecting specific items, and therefore the use of this terminology increases the confusion. Without the context of the release, this could be interpreted as a) further investigating all items in a sample selection, b) further investigating certain items in a sample selection for which the auditor deemed further investigation may be necessary or c) further investigating findings from analytical procedures.

Second, regarding the items identified as meeting criteria established by the auditor, it is unclear whether the auditor should test 100% of the items or if the auditor may select specific items or use a sampling approach to test less than 100% of the items under appropriate circumstances. For example, an auditor may use technology-assisted analysis to analyze 100% of a population and “it is possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor.”⁴ We refer to the returned items as outliers. Taking into consideration the assessment of risk, if the auditor determines that all the outliers have similar characteristics such that audit sampling can be expected to be representative of that population of outliers, and the results can be projected to the population of outliers, we believe sampling the outliers could be an appropriate approach to obtain sufficient appropriate audit evidence. Similarly, the example regarding performing substantive procedures for raw material purchase transactions implies it would be permitted to select specific items for testing where the risk of material misstatement has been assessed as lower.⁵ We request additional guidance regarding whether the Board agrees that testing less than 100% of the outliers would be permitted under certain circumstances. If the Board agrees, we request that position and the relevant considerations to be clarified and formalized in the standards. Additionally, we request that the raw material purchase transactions example be included in the proposed standards or, at minimum, in the adopting release.

Third, if the analysis returns no outliers, there is not sufficient guidance on whether that may be considered sufficient appropriate audit evidence under certain circumstances or whether further consideration would always be necessary. We believe there are situations in which further consideration would be necessary, as well as situations in which the lack of outliers would provide sufficient appropriate audit evidence. We request additional guidance as to whether the Board agrees and the reasons for agreement or disagreement. If the Board agrees, we request that to be clarified and formalized in the standards.

Fourth, there are instances where technology-assisted analysis may be modified after the original analysis is completed. The extant and proposed standards lack sufficient guidance for consideration in these instances.

³ AS 2305, *Substantive Analytical Procedures*, and AS 3110, *Dating of the Independent Auditor's Report*

⁴ Page 21 of the proposal

⁵ Page 22 of the proposal

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Fifth, the four bullets in proposed AS 2301.37A are redundant with other PCAOB auditing standards. Specifically, bullets a., b. and d. are addressed by AS 2110.74. Additionally, they are addressed by AS 2301.46, AS 2101.15 and AS 1215.12.b, respectively. Bullet c is addressed by AS 2810 and AS 2301.34. It is also more specifically addressed by AS 2315.27 for sampling in a test of details and AS 2305.21 for substantive analytical procedures. We believe adding these four considerations to this proposed paragraph creates confusion. In that regard:

- As described above, proposed AS 2301.37A as currently written can be interpreted to be inclusive of audit sampling and substantive analytical procedures. If that is the case, it is unclear whether the Board expects the auditor to explicitly document each of these four considerations for every item selected in an audit sample or for which items in substantive analytical procedures.
- If the Board's intention is for proposed AS 2301.37A to be specific to selecting specific items for testing, it calls into question whether there are expected differences in the application of these four considerations when the auditor selects specific items versus applying a different procedure, such as sampling used in a test of details or substantive analytical procedures. If there are intended differences in the application, that should be made clear in the standards and the release. If there are not intended differences in the application, we recommend removing these bullets and referring to other extant standards, either through a note or a footnote, where these considerations are addressed.

Lastly, if the Board seeks to improve the identification and assessment of risks of material misstatement, as suggested in the question, we recommend amending AS 2110 with such sought-after improvements.

8. What other factors, if any, should the auditor consider when investigating items that meet criteria established by the auditor when designing or performing substantive procedures?

Please see our response to question 7 above.

9. Are the proposed amendments that specify requirements for the auditor to perform procedures to evaluate the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence clear and appropriate? If not, what changes should be made to the amendments?

We believe the reliability of information obtained from sources external to the company is an important topic that can be improved upon in the PCAOB auditing standards.⁶ Specifically, we believe auditing standards requiring the auditor to evaluate the reliability of external information maintained by the company in electronic form and used as audit evidence are warranted and would enhance audit quality.

⁶ Page 24 of the proposal indicates that the reasoning for these updates is as follows: "Because the information is maintained in the company's information system and can potentially be modified by the company, we believe it important to address in PCAOB standards the reliability of audit evidence that the auditor obtains through using this type of information." We believe it is important to acknowledge that modification of information may be intentional or unintentional. The risks of intentional versus unintentional modification of information are different and may require different types and varying degrees of audit responses. If the auditor has identified a risk of material misstatement due to fraud related to the reliability of information, a heightened awareness, increased professional skepticism and potentially incremental procedures may be necessary. Likewise, if the auditor has not identified a risk of material misstatement due to fraud related to the reliability of information, the auditor would be applying the procedures described in these proposed amendments to determine whether the information is complete and accurate with the assumption that any incompleteness or inaccuracies would be unintentional. This distinction should be considered throughout the proposed amendments discussed in questions 9, 10, and 11.

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However, proposed AS 1105.10A does not clearly or appropriately achieve this goal. The proposed amendment is not clear and appropriate for the following reasons:

- **It is unclear whether the combination of proposed footnote 3A in AS 1105.10 and subpart (b) of proposed AS 1105.10A requires the auditor to test controls over the reliability of external information maintained by the company in electronic form that the auditor uses as audit evidence.** Despite subpart (b) stating “or test the company’s procedures,” it remains unclear how the PCAOB would view situations in which the auditor chooses to not test controls.
- **The types of tests of controls the Board expects auditors to perform is unclear.** It would be helpful to have further explanation and additional examples provided in implementation guidance if the amendments are adopted in substantially the same form as written in the proposal.
- **The meaning and practical application of “test the company’s procedures” is unclear.** If controls are not required to be tested and the auditor instead chooses to “test the company’s procedures,” what does this entail? While we acknowledge that controls and processes or procedures have different meanings, we do not understand how “testing the company’s procedures” would practically result in a different type of test in comparison to testing the company’s controls. What other types of procedures could an auditor perform to evaluate the reliability of external information maintained by the company in electronic form? If the Board’s intention is for the auditor to test controls, we recommend clarifying this by removing “or test the company’s procedures...” from the proposal. However, we do not believe that is an appropriate stance; please see our response to question 11 below. Rather, we recommend clarifying “or test the company’s procedures...” within the standard accompanied by further explanation and additional examples provided in implementation guidance.
- **It is unclear whether directly testing the reliability would be allowable.** Regarding information produced by the company, AS 1105.10 allows the auditor to either test controls over the accuracy and completeness of information or test the accuracy and completeness directly (“direct testing”). We strongly believe direct testing should be an allowable approach for evaluating the reliability of external information maintained by the company in electronic form. For example:
 - In the case of purchase orders, we believe confirming with the external party could provide evidence of reliability. Would that satisfy the requirement to “test the company’s procedures”? If this is an acceptable procedure, would the auditor be required to confirm every purchase order for every revenue transaction selected for testing? Or would the auditor be permitted to sample all purchase orders and then, based on the results of the sample tested, determine the external information included in the purchase orders is reliable?
 - In the case of cash receipts, we believe logging directly into the company’s online banking system or observing the company log into their online banking system could provide evidence of reliability. Would that satisfy the requirement to “test the company’s procedures”?
- **If the auditor is unable to achieve the objectives of paragraph .10A, it is unclear how the auditor’s conclusions would be affected.** Would the auditor be precluded from using the information? As noted above, we strongly believe that direct testing should be allowable. If the Board disagrees, we request the Board provide additional guidance on what auditors should do if and when a company lacks sufficient effective controls.
- **For information produced by a service organization, it is unclear how the requirements of footnote 3 of AS 1105.10 and the proposed AS 1105.10A interrelate.**

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10. Are the proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence clear and appropriate? If not, what changes should be made?

The proposed amendments that emphasize the importance of controls over information technology for the reliability of audit evidence need clarifications as follows:

- We interpret the proposed revisions to AS 1105.08 to mean that effective controls over information simply increases the reliability of that information, but the lack of effective controls over information does not inherently deem the information to be unreliable. The auditor may directly test the reliability of information. If the Board disagrees with this interpretation, it is imperative that further revisions be made or for the Board to clarify its position in the adopting release.
- We believe the proposed revisions to AS 1105.15 are less clear on this matter. Although AS 1105.15 indicates there are “varying degrees of reliability,” the revised paragraph goes on to state “the reliability... *depends*⁷ on the effectiveness of the controls over that information.” This statement may be interpreted to mean information cannot be reliable without effective controls. This contradicts our interpretation of AS 1105.08. The Board’s intention is unclear and should be clarified in the standard and adopting release. We believe the lack of effective controls over information does not inherently deem the information to be unreliable, and this is the position we recommend the Board take upon clarifying this amendment.
- Footnote 49 on page 25 of the release is informative. Adding a footnote with similar information in the proposed standard would clarify the meaning of “where applicable.”

11. When the auditor uses information produced by the company and external information maintained by the company in electronic form, should PCAOB standards require internal controls over such information to be tested and determined to be effective for such information to be considered reliable audit evidence?

No, we do not believe PCAOB standards should require testing internal controls in order for information to be considered reliable audit evidence. As stated in the release, “The proposed amendments are principles-based....”⁸ We believe requiring internal controls to be tested and determined effective in order for information to be considered reliable would be rules-based, not principles-based. The standards should allow auditors to use professional judgment in determining the appropriate response when evaluating the reliability of information. We considered the following factors in our response:

- **While tests of controls may be an effective option in many circumstances, it is not always the most effective option.** For example, in certain situations, confirming information directly with a third party or vouching information to publicly available information may provide more persuasive evidence than testing controls over the reliability of that information. As described in our response to question 9 above, we strongly believe direct testing should be an allowable approach for evaluating the reliability of external information maintained by the company in electronic form. We have the same opinion for evaluating the reliability of information produced by the company.
- **The absence of effective internal controls does not inherently indicate information is unreliable.** PCAOB standards note that a material weakness in internal control over financial

⁷ Emphasis added

⁸ Page 5 of the proposal

reporting may exist even when financial statements are not materially misstated.⁹ We believe this same concept can be applied in this context: internal controls over the reliability of information may be deemed ineffective even when the information is in fact complete and accurate. If an auditor can obtain assurance over the reliability of information directly, we believe the auditor should be allowed to use such information.

- **Principles-based standards allow auditors to adapt as necessary to achieve the intended objectives, regardless of company size, experience or sophistication.** For smaller and newer companies not subject to Section 404(b) of the Sarbanes-Oxley Act of 2002, controls over such information may not be formalized in a way that would be sufficient for testing under PCAOB auditing standards; therefore, requiring tests of controls over this information would create burdens and increase costs for these companies. When the auditor can obtain assurance of reliability through direct tests, we believe the benefits of such a requirement would not surpass the increased costs. Further, while complying with such a requirement may be less costly and burdensome for companies subject to Section 404(b), we also believe it is inappropriate to require testing controls over the reliability of information used in substantive testing due to the reasons described above.

12. Are the proposed amendments that update certain terminology in AS 1105 clear and appropriate? If not, what changes should be made?

Please see our proposed amendments to AS 1105.21 in our response to question 4 above regarding the phrase “among both financial and nonfinancial data that can be external or company-produced.” We believe it is beneficial to rephrase this as suggested above to clarify a) it is not expected for every analytical procedure to include both financial and nonfinancial data and b) data can be originally sourced externally and housed internally.

Additionally, please see our response to question 7 above regarding the terminology used in proposed AS 2301.37A.

We have no concerns with updating the other terminology described on page 26 of the release and believe the proposed amendments to be clear and appropriate.

15. Are there additional potential benefits that should be considered?

In addition to the benefits described in the release, auditors may gain a better understanding of management’s data and processes which could lead to better risk assessment.

18. The Board requests comment generally on the potential unintended consequences of the proposal. Are the responses to the potential unintended consequences discussed in the release adequate? Are there additional potential unintended consequences that the Board should consider? If so, what responses should be considered?

In the future, there could be a belief demonstrated through PCAOB inspections that technology-assisted analysis of information in electronic form is the best, and therefore, the only acceptable approach to risk assessment. While technology-assisted analysis may be beneficial, it is not the only acceptable approach, and we believe it is imperative for the standards and enforcement of such standards to give auditors the flexibility to exercise professional judgment to select the most appropriate procedures given the facts and circumstances of each audit. As the proposal is currently written, technology-assisted

⁹ AS 2201.03

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analysis is not required to be used in financial statement audits. We commend the Board for this and believe it is important for this to continue to be the case, both as written in the final standard to be adopted as well as in how the standard is enforced in the future. To ensure enforcement aligns with this position, we recommend the Board explicitly state the lack of this requirement in the final standards to be adopted.

22. The Board requests comment generally on the analysis of the impacts of the proposal on EGCs. Are there reasons why the proposal should not apply to audits of EGCs? If so, what changes should be made so that the proposal would be appropriate for audits of EGCs? What impact would the proposal likely have on EGCs, and how would this affect efficiency, competition, and capital formation?

We believe the proposal should apply to emerging growth companies (EGCs).

23. How much time following SEC approval would audit firms need to implement the proposed requirements?

We recommend an effective date of audits of periods ending on or after December 15 at least one year after approval by the SEC, as implementation of amended auditing standards involves updating our methodology, tools and resources; testing them for quality control; releasing them to the audit practice; and developing and delivering training sessions on these changes. Implementation of the proposed amendments to AS 1105 regarding internal controls could also require additional time for issuers to formalize controls over external data and for auditors to test such controls to the extent they are not already formalized or tested.

Many firms who perform audits in accordance with PCAOB standards use purchased audit methodologies and software tools and rely on these updates to implement and train on changes. The PCAOB should consult directly with the methodology providers to understand the timeline needed for them to implement the changes into their tools as well as then distribute and train auditors on the changes. This can inform the PCAOB on the needed timeline for implementation.

* * * * *

We would be pleased to respond to any questions the PCAOB or its staff may have about our comments. Please direct any questions to Adam Hallemeier, Deputy Chief Auditor, at 619.641.7318, or Sara Lord, Chief Auditor, at 612.376.9572.

Sincerely,

RSM US LLP

RSM US LLP

August 25, 2023

PCAOB
Office of the Secretary
1666 K Street, NW
Washington, DC 20006-2803

Email: comments@pcaobus.org

RE: Request for Comments on PCAOB Rulemaking Docket Matter No. 052 - *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form* (Release No. 2023-004)

PCAOB Board:

The views expressed herein are written on behalf of the Professional Standards Committee (PSC) of the Texas Society of CPAs. The committee has been authorized by the Texas Society of CPAs' Leadership Council to submit comments on matters of interest to the membership. The views expressed in this document have not been approved by the Texas Society of CPAs' Leadership Council or Board of Directors and, therefore, should not be construed as representing the views or policy of the Texas Society of CPAs.

The PSC is supportive of the Board's efforts to update auditing standards to more specifically address aspects of designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools (i.e., technology-assisted analysis or data analytics). The PSC generally supports the proposed amendments as a first step in modernizing standards relating to use of technology in the audit process, subject to the following comments.

PCAOB Release No. 2023-004 states that the "proposed amendments are principles-based and therefore are intended to be adaptable to the ever-evolving nature of technology." A principles-based approach to setting auditing standards is generally appropriate to facilitate the application of significant auditor judgement. However, the PSC believes that the proposed amendments do not provide sufficient practical guidance to auditors and should be supplemented with more specific, detailed discussion and examples, like the approach used often by the Financial Accounting Standards Board.

The proposed amendments state that "surveys indicate that some firms are reluctant to implement data analytics in their audit approach due to perceived regulatory risks." The PSC agrees with this conclusion, understanding that many firms will implement data analytics for use in risk assessment, but may avoid using substantive analytical procedures due to lack of regulatory guidance. The proposed amendments also state that "Collectively, the proposed amendments should lead auditors to perceive less risk of non-compliance with PCAOB standards when using the technology-assisted analysis." The PSC does not believe that the proposed amendments, as currently drafted, will fully accomplish that goal.

For example, the proposed amendments emphasize that the relevance of audit evidence depends on the level of disaggregation or detail of information necessary to achieve the objective of an audit procedure, but the proposal does not prescribe an expected level of disaggregation or detail,



as auditor judgment is needed to determine the relevance of the information. The PSC agrees that prescribed levels are not appropriate or practical, but additional guidance is necessary. The proposed amendments could include observations and examples from the Board's inspections of sufficient (or inadequate) determinations of disaggregation levels, which would assist the auditor in making similar judgments.

Additionally, the proposed amendments specify considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive procedures on all or part of a population of items but does not prescribe the nature or extent of procedures for investigating the identified items, including the number of items selected for further testing. Again, the PSC agrees prescriptive procedures are unnecessary, but additional guidance is needed.

For example, the PSC understands that, in some instances, when many items are identified, auditors use sampling procedures as part of further investigation. The Board could provide its views on the acceptability of sampling procedures in this circumstance, as well as the Board's observations of acceptable or unacceptable alternative examples of investigating identified items, including examples where the number of items selected for further testing was determined to be inadequate and the basis for that determination.

In summary, the PSC recommends that the Board reexamine the proposed amendments to identify opportunities to provide expanded practical guidance to auditors, which is necessary to accomplish the goal of expanding the auditor's use of technology and data analytics in the audit in a manner consistent with standards issued by the PCAOB.

We appreciate the opportunity to provide feedback on PCAOB Release 2023-004: *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*.

Sincerely,



Jeffrey L. Johanns, CPA
Chair, Professional Standards Committee
Texas Society of Certified Public Accountants



**Amendments Related to Aspects of
Designing and Performing Audit Procedures
that Involve Technology-Assisted Analysis of
Information in Electronic Form**

PCAOB Release No. 2024-007
June 12, 2024

PCAOB Rulemaking
Docket Matter No. 052

Summary: The Public Company Accounting Oversight Board (“PCAOB” or the “Board”) is adopting amendments to AS 1105, *Audit Evidence*, and AS 2301, *The Auditor’s Responses to the Risks of Material Misstatement*, and adopting conforming amendments to another auditing standard. The amendments are designed to improve audit quality and enhance investor protection by addressing aspects of designing and performing audit procedures that involve technology-assisted analysis of information in electronic form.

Board

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Amendments:

The Board is adopting amendments to:

- (1) Revise AS 1105, *Audit Evidence*;
- (2) Revise AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*; and
- (3) Conform AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements*.

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I. EXECUTIVE SUMMARY

We are adopting amendments to AS 1105, *Audit Evidence*, and to AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*, and are adopting conforming amendments to another PCAOB auditing standard (collectively, the "amendments" or "final amendments"). The amendments are designed to improve audit quality and enhance investor protection by addressing the growing use of certain technology in audits.

In particular, the amendments update PCAOB auditing standards to more specifically address certain aspects of designing and performing audit procedures that involve analyzing information in electronic form with technology-based tools (i.e., technology-assisted analysis). The amendments are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report.

Why the Board is Adopting These Changes Now

Information from the PCAOB's research project on *Data and Technology* indicates that some auditors are expanding their use of technology-assisted analysis (often referred to in practice as "data analysis" or "data analytics") in the audit. Auditors use technology-assisted analysis in many different ways, including when responding to significant risks of material misstatement to the financial statements. For example, some auditors use technology-assisted analysis to examine the correlation between different types of transactions, compare company information to auditor-developed expectations or third-party information, or recalculate company information.

Existing PCAOB standards discuss certain fundamental auditor responsibilities, including addressing the risks of material misstatement to the financial statements by obtaining sufficient appropriate audit evidence. However, the standards do not specifically address certain aspects of using technology-assisted analysis in the audit. If not designed and executed appropriately, audit procedures that involve technology-assisted analysis may not provide sufficient appropriate audit evidence as required by the standards.

Having considered the expanded use of technology-assisted analysis by auditors, we proposed amendments in June 2023 to address certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Commenters generally supported the objective of improving audit quality and enhancing investor protection by clarifying and strengthening requirements in AS 1105 and AS 2301 related to certain aspects of designing and performing audit procedures that involve technology-assisted analysis. In adopting these final amendments, we have taken into account the comments received.

Key Provisions of the Final Amendments

The amendments further specify and clarify certain auditor responsibilities that are described in AS 1105 and AS 2301. The amendments are focused on addressing certain aspects of technology-assisted analysis, not specific matters relating to other technology applications used in audits (e.g., blockchain or artificial intelligence) or the evaluation of the appropriateness of tools under the firm's system of quality control. The amendments are principles-based and therefore intended to be adaptable to the evolving nature of technology. In particular, the amendments:

- Specify considerations for the auditor's investigation of items identified when performing tests of details;
- Specify that if the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure;
- Specify auditor responsibilities for evaluating the reliability of external information provided by the company in electronic form and used as audit evidence;
- Emphasize the importance of controls over information technology;
- Clarify the description of a "test of details";
- Emphasize the importance of appropriate disaggregation or detail of information to the relevance of audit evidence; and
- Update certain terminology in AS 1105 to reflect the greater availability of information in electronic form and improve the consistency of the use of such terminology throughout the standard.

The amendments will apply to all audits conducted under PCAOB standards. Subject to approval by the U.S. Securities and Exchange Commission ("SEC"), the amendments will take effect for audits of financial statements for fiscal years beginning on or after December 15, 2025.

This release provides background on the Board's standard-setting project, discusses the details of the amendments, and includes an economic analysis that further considers the need for standard setting and the anticipated economic impacts of the amendments. The release also includes two appendices. Appendix 1 sets forth the text of the amendments. Appendix 2 sets forth conforming amendments to another PCAOB auditing standard.

II. BACKGROUND

In 2010, the Board adopted auditing standards related to the auditor's assessment of and response to risk (the "risk assessment standards"), including AS 1105, *Audit Evidence*, and AS 2301, *The Auditor's Responses to Risks of Material Misstatement*. Although the risk assessment standards were designed to apply to audits when auditors use information technology, the use of information in electronic form¹ and the use of technology-based tools² by companies and their auditors to analyze such information has expanded significantly since these standards were adopted.

In light of the increased use of technology by companies and auditors, in 2017 the Board began a research project to assess the need for guidance, changes to PCAOB standards, or other regulatory actions.³ Through this research we found that auditors have expanded their use of certain technology-based tools, including tools used to perform technology-assisted analysis (as described above, also referred to in practice as "data analytics" or "data analysis"⁴), to plan and perform audits. While our research indicated that auditors are using technology-assisted analysis to obtain audit evidence, it also indicated that existing PCAOB standards could address more specifically certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Consequently, under existing standards, there is a greater risk that when using technology-assisted analysis in designing and performing audit procedures, auditors may fail to obtain sufficient appropriate evidence in the audit.

The amendments in this release are intended to improve audit quality through principles-based requirements that apply to all audits conducted under PCAOB standards. They are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the

¹ In this release, the term "information in electronic form" encompasses items in electronic form that are described in PCAOB standards using terms such as "information," "data," "documents," "records," "accounting records," and "company's financial records."

² In this release, the term "tool" refers to specialized software that is used on audit engagements to examine, sort, filter, and analyze transactions and information used as audit evidence or which otherwise generates information that aids auditor judgment in the performance of audit procedures. Spreadsheet software itself without specific programming is not inherently a tool, but a spreadsheet may be built to perform the functions of a tool (examining, sorting, filtering, etc.), in which case it is included within the scope of this term. The PCAOB staff's analysis was limited to tools classified or described by the firms as data analytic tools. Tools may be either purchased by a firm or developed by a firm.

³ See PCAOB's *Data and Technology* research project, available at <https://pcaobus.org/oversight/standards/standard-setting-research-projects/data-technology>.

⁴ In this release, the terms "data analysis" or "data analytics" are used synonymously.

report. The remainder of this section of the release provides an overview of the rulemaking history, existing requirements, and current practice. In addition, it discusses reasons to improve the existing standards.

A. Rulemaking History

In June 2023, we proposed to amend AS 1105 and AS 2301 to address aspects of designing and performing audit procedures that involve technology-assisted analysis and that our research indicated are not specified in existing PCAOB standards.⁵ The proposed amendments were informed by the staff's research regarding auditors' use of technology, as described above.

The proposed amendments: (i) specified considerations for the auditor's investigation of items that meet criteria established by the auditor when designing or performing substantive audit procedures; (ii) specified that if an auditor uses audit evidence from an audit procedure for more than one purpose the procedure needs to be designed and performed to achieve each of the relevant objectives; (iii) provided additional details regarding auditor responsibilities for evaluating the reliability of external information maintained by the company in electronic form and used as audit evidence; (iv) clarified the differences between "tests of details" and "analytical procedures," and emphasized the importance of appropriate disaggregation or detail of information to the relevance of audit evidence; and (v) updated certain terminology in AS 1105 to reflect the greater availability of information in electronic form and improve the consistency of the use of such terminology throughout the standard.

We received 21 comment letters on the proposal. Commenters included an investor-related group, registered public accounting firms ("firms"), firm-related groups, academics, and others. We have considered all comments in developing the final amendments, and specific comments are discussed in the analysis that follows. Commenters generally supported the Board's efforts to modernize the auditing standards to specifically address certain aspects of designing and performing audit procedures that involve technology-assisted analysis, and some commenters offered suggestions to improve and clarify the proposed amendments.

B. Existing Requirements

The final amendments modify certain requirements of PCAOB standards relating to audit evidence and responses to risk (AS 1105 and AS 2301). AS 1105 explains what constitutes audit evidence and establishes requirements regarding designing and performing audit procedures to obtain sufficient appropriate audit evidence. AS 2301 establishes requirements

⁵ *Proposed Amendments Related to Aspects of Designing and Performing Audit Procedures that Involve Technology-Assisted Analysis of Information in Electronic Form*, PCAOB Rel. No. 2023-004 (June 26, 2023) ("proposal" or "proposing release").

regarding designing and implementing appropriate responses to identified and assessed risks of material misstatement.

The following discussion provides a high-level overview of the areas of the PCAOB standards that the amendments address. Section III below provides additional details regarding the specific requirements that we have amended.

Classification of Audit Procedures (See Figure 1 below) – Under PCAOB standards, audit procedures can be classified into either risk assessment procedures or further audit procedures, which consist of tests of controls and substantive procedures. Substantive procedures include tests of details and substantive analytical procedures.⁶ Existing standards provide examples of specific audit procedures⁷ and describe what constitutes a substantive analytical procedure,⁸ but do not describe what constitutes a test of details. PCAOB standards do not preclude the auditor from designing and performing audit procedures to accomplish more than one purpose. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.⁹

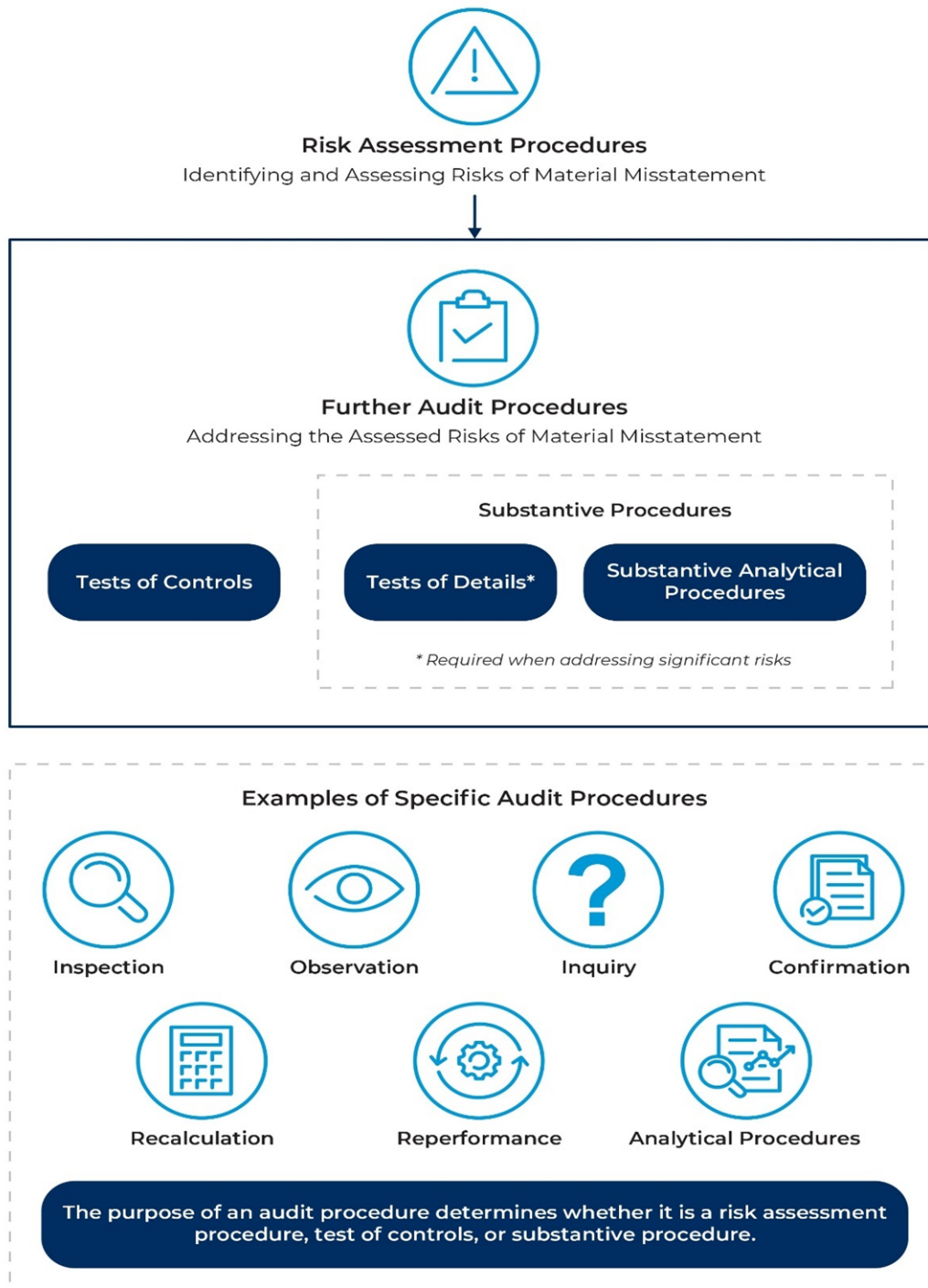
⁶ See AS 1105.13.

⁷ See AS 1105.15-.21.

⁸ See AS 2305, *Substantive Analytical Procedures*.

⁹ See AS 1105.14.

Figure 1. Classification of Audit Procedures



Items Identified for Investigation in a Test of Details – Designing substantive tests of details and tests of controls includes determining the means of selecting items for testing. Under existing standards, the alternative means of selecting items for testing include selecting specific items, selecting a sample that is expected to be representative of the population (i.e., audit sampling), or selecting all items. The auditor may decide to select for testing specific items within a population because they are important to accomplishing the objective of the audit procedure or because they exhibit some other characteristic.¹⁰ Existing PCAOB standards specify the auditor’s responsibilities for planning, performing, and evaluating an audit sample,¹¹ but do not specify the auditor’s responsibilities for addressing items identified when performing a test of details on specific items, or all items, within a population.

Relevance and Reliability of Audit Evidence – Under PCAOB standards, audit evidence is all the information, whether obtained from audit procedures or other sources, that is used by the auditor in arriving at the conclusions on which the auditor’s opinion is based.¹² PCAOB standards require the auditor to plan and perform audit procedures to obtain sufficient appropriate audit evidence to provide a reasonable basis for their audit opinion. Sufficiency is the measure of the quantity of audit evidence, and appropriateness is the measure of its quality. To be appropriate, audit evidence must be both relevant and reliable in providing support for the auditor’s conclusions.¹³

The relevance of audit evidence depends on the design and timing of the audit procedure. The reliability of audit evidence depends on the nature and source of the evidence and the circumstances under which it is obtained, such as whether the information is provided to the auditor by the company being audited and whether the company’s controls over that information are effective.¹⁴ In addition, when using information produced by the company as audit evidence, the auditor is responsible for evaluating whether the information is sufficient and appropriate for purposes of the audit.¹⁵ Existing PCAOB standards do not specify auditor responsibilities regarding information the company received from one or more external sources and provided in electronic form to the auditor to use as audit evidence.

C. Current Practice

Our research indicated that audit procedures involving technology-assisted analysis are an important component of many audits. The use of technology-assisted analysis has expanded

¹⁰ See AS 1105.22-.27.

¹¹ See AS 2315, *Audit Sampling*.

¹² See AS 1105.02.

¹³ See AS 1105.04-.06.

¹⁴ See AS 1105.07-.08.

¹⁵ See AS 1105.10.

over the last decade as more accounting firms, including smaller firms, incorporate such analysis as part of their audit procedures. However, the investment in and use of technology-assisted analysis vary across registered firms and across individual audit engagements within a firm.¹⁶

The greater availability of both information in electronic form and technology-based tools to analyze such information has contributed significantly to the increase in the use of technology-assisted analysis by auditors. More companies use enterprise resource planning (“ERP”) and other information systems that maintain large volumes of information in electronic form, including information generated internally by the company and information that the company receives from external sources. Significant volumes of this information are available to auditors for use in performing audit procedures.

Powerful technology-based tools that process and analyze large volumes of information have become more readily available to auditors. As a result, auditors sometimes apply technology-assisted analysis to the entire population of transactions within one or more financial statement accounts or disclosures. Our research indicated that auditors primarily use technology-assisted analysis to identify and assess risks of material misstatement. Technology-assisted analysis enables the auditor to identify new risks or to refine the assessment of known risks. For example, by analyzing a full population of revenue transactions, an auditor may identify certain components of the revenue account as subject to higher risks or may identify new risks of material misstatement associated with sales to a particular customer or in a particular location.

Increasingly, some auditors also have been using technology-assisted analysis in audit procedures that respond to assessed risks of material misstatement, including in substantive procedures. For example, such analysis has been used to test the details of all items in a population, assist the auditor in selecting specific items for testing based on auditor-developed criteria, or identify items for further investigation when performing a test of details. The staff has observed that auditors’ use of technology-assisted analysis occurs mostly in the testing of revenue and related receivable accounts, inventory, journal entries, expected credit losses, and investments.¹⁷ As discussed below in Section III.B, some auditors use audit evidence obtained from such analysis to achieve more than one purpose.

Audit methodologies of several firms affiliated with global networks address the use of technology-assisted analysis by the firms’ audit engagement teams. For example, the methodologies specify audit engagement teams’ responsibilities for: (i) designing and performing audit procedures that involve technology-assisted analysis (e.g., determining

¹⁶ See also discussion in Section IV.A below of this release.

¹⁷ See PCAOB, *Spotlight: Staff Update and Preview of 2021 Inspection Observations* (Dec. 2022), at 15, available at https://pcaob-assets.azureedge.net/pcaob-dev/docs/default-source/documents/staff-preview-2021-inspection-observations-spotlight.pdf?sfvrsn=d2590627_2/.

whether an audit procedure is a substantive procedure); (ii) evaluating analysis results (e.g., whether identified items indicate misstatements or whether performing additional procedures is necessary to obtain sufficient appropriate audit evidence); and (iii) evaluating the relevance and reliability of information used in the analysis.

Commenters on the proposal generally agreed with the description of the current audit practice and the auditor's use of technology-assisted analysis. One of these commenters noted that, in addition, auditors can also use technology-assisted analysis to help understand a company's flow of transactions, especially given increases in the number and complexities of a company's information systems.

D. Reasons to Improve the Auditing Standards

The amendments in this release are intended to improve audit quality through principles-based requirements that apply to all audits.

1. Areas of Improvement

The amendments are designed to decrease the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report. Observations from the PCAOB's *Data and Technology* research project indicate that some auditors are using technology-assisted analysis in audit procedures whereas others may be reluctant to do so due to perceived regulatory uncertainty. The research further suggests that clarifications to PCAOB standards could more specifically address certain aspects of designing and performing audit procedures that involve technology-assisted analysis. The Board's Investor Advisory Group has also noted that auditors' use of technology-assisted analysis is an area of concern due to auditors' potential overreliance on company-produced information, and that addressing the use of such analysis in the standards could be beneficial.¹⁸

Using technology-assisted analysis may enhance the effectiveness of audit procedures. For example, analyzing larger volumes of information and in more depth may better inform the auditor's risk assessment by providing different perspectives, providing more information when assessing risks, and exposing previously unidentified relationships that may reveal new risks. At the same time, inappropriate application of PCAOB standards when designing and performing audit procedures that involve technology-assisted analysis has the potential to compromise the quality of audits where the procedures are used. For example, PCAOB oversight activities have found instances of noncompliance with PCAOB standards related to evaluating the relevance

¹⁸ See Proposing Release at 12 for additional discussion of investors' concerns.

and reliability of company-provided information and evaluating certain items identified in audit procedures involving technology-assisted analysis.¹⁹

The amendments to existing PCAOB standards in this release address aspects of designing and performing audit procedures that involve technology-assisted analysis where we have identified the need for additional specificity or clarity in the existing standards.²⁰ These aspects include areas where PCAOB oversight activities have identified instances of noncompliance with PCAOB standards and areas where auditors have raised questions during our research regarding the applicability of PCAOB standards to the use of technology-assisted analysis. Section III below discusses the amendments in more detail. Section IV further below discusses alternatives that we considered.

2. Comments on the Reasons to Improve

Commenters generally supported the Board's efforts to modernize our auditing standards to specifically address aspects of designing and performing audit procedures that involve technology-assisted analysis. Several commenters highlighted that auditors' use of technologies, including technology-assisted analysis, continues to grow, and one of these commenters noted that the proposal is an important step forward to address this rapidly changing environment. An investor-related group stated that PCAOB standards should directly address auditors' use of technology and data, and that the proposed amendments to AS 1105 and AS 2301 were responsive to their concern about auditor overreliance on technology-assisted analysis.

Commenters also generally supported the principles-based nature of the proposed amendments and the Board's decision not to require the use of technology-assisted analysis. One commenter, for example, noted that audit procedures performed using technology-based tools may not always provide sufficient appropriate audit evidence. An investor-related group, however, recommended that the Board consider requiring auditors to use certain (but unspecified) types of technology-based tools that financial research and investment management firms have used to analyze financial statements. As discussed further below in Section IV.D.3, requiring the use of technology would be outside the scope of the project. We have retained the principles-based nature of the proposed amendments within the final

¹⁹ See, e.g., PCAOB, *Spotlight: Staff Update and Preview of 2020 Inspection Observations* (Oct. 2021), at 9, PCAOB, *Spotlight: Staff Update and Preview of 2021 Inspection Observations* (Dec. 2022), at 15, and PCAOB, *Spotlight: Staff Update and Preview of 2022 Inspection Observations* (July 2023), at 12, available at <https://pcaobus.org/resources/staff-publications>.

²⁰ Other PCAOB standard-setting projects may address other aspects of firms' and auditors' use of technology in performing audits. For example, see paragraphs .44h, .47h, and .51 of QC 1000, *A Firm's System of Quality Control*, PCAOB Rel. No. 2024-005 (May 13, 2024), which discusses a firm's responsibilities related to technological resources.

amendments, so that the standards are flexible and can adapt to the continued evolution of technology.

Several commenters stated that the Board should consider the effect of auditors' and companies' use of technology more broadly on the audit. One commenter stated that technology will need to be an ongoing focus for the Board in its standard setting given the evolving nature of technology, and that broader change may be needed. This commenter also recommended a more holistic standard-setting approach that is interconnected with other PCAOB projects. Other commenters stated that as technology continues to evolve, the Board should continue to research and evaluate the need for standard setting related to other types of technology used in the audit, such as artificial intelligence. Academics emphasized the need for the PCAOB to be forward-thinking to regulate in this area.

As we stated in the proposal, these amendments address only one area of auditors' use of technology – certain aspects of designing and performing audit procedures that involve technology-assisted analysis. Other areas continue to be analyzed as part of our ongoing research activities. In addition, the Board's Technology Innovation Alliance Working Group continues to advise the Board on the use of emerging technologies by auditors and preparers relevant to audits and their potential impact on audit quality.²¹ These ongoing activities may inform future standard-setting projects.

Commenters also expressed a need for more guidance and illustrative examples. One of these commenters stated that additional explanatory materials or separate guidance could help maintain competition among firms. Another stated that insights from the PCAOB's research and oversight activities would benefit small and mid-sized accounting firms in identifying and selecting appropriate tools.

Throughout this release, where appropriate, we have incorporated examples and considerations for applying the final amendments. The examples and considerations highlight the principles-based nature of the amendments and emphasize that the nature, timing, and extent of the auditor's procedures will depend on the facts and circumstances of the audit engagement. In addition, the staff's ongoing research activities will continue to evaluate the need for staff guidance.

²¹ See *PCAOB Technology Innovation Alliance Working Group*, available at <https://pcaobus.org/about/working-groups-task-forces/technology-innovation-alliance-working-group>.

III. DISCUSSION OF THE FINAL AMENDMENTS

A. Specifying Auditor Responsibilities When Performing Tests of Details

See paragraphs .10 and .48 through .50 of AS 2301 of the amendments in Appendix 1.

1. Clarifying “Test of Details”

We proposed to amend AS 1105.13 and .21 to address the differences between the terms “test of details” and “analytical procedures,” by clarifying the meaning of the term “test of details.” The proposed amendments stated that a test of details involves performing audit procedures with respect to individual items included in an account or disclosure, whereas analytical procedures generally do not involve evaluating individual items, unless those items are part of the auditor’s investigation of significant differences from expected amounts. We are adopting the proposed description of a “test of details” with certain modifications as discussed further below, including relocating the description from AS 1105 to new paragraph .48 in AS 2301.

Under PCAOB standards, the auditor’s responses to risks of material misstatement involve performing substantive procedures for each relevant assertion of each significant account and disclosure, regardless of the assessed level of control risk.²² Substantive procedures under PCAOB standards include tests of details and substantive analytical procedures.²³ Appropriately designing and performing an audit procedure to achieve a particular objective is key to appropriately addressing the risks assessed by the auditor. For significant risks of material misstatement, including fraud risks, the auditor is required to perform substantive procedures, including tests of details that are specifically responsive to the assessed risk.²⁴ PCAOB standards also state that it is unlikely that audit evidence obtained from substantive analytical procedures alone would be sufficient.²⁵

As discussed in the proposal, the use of “data analytics” or “data analysis” in practice and the use of the term “analytical procedures” in PCAOB standards have led to questions about whether an audit procedure involving technology-assisted analysis can be a test of details (i.e., not an analytical procedure as described under PCAOB standards). The distinction is important because of the requirement in PCAOB standards that the auditor perform tests of

²² See AS 2301.36.

²³ See AS 1105.13.b(2).

²⁴ See AS 2301.11 and .13 (specifying the auditor’s responsibilities for responses to significant risks, which include fraud risks).

²⁵ See AS 2305.09.

details when responding to an assessed significant risk of material misstatement. Relying on analytical procedures alone to address an assessed significant risk is not sufficient.

Commenters on this topic supported clarifying the meaning of tests of details and that tests of details involve performing audit procedures at an individual item level. However, several commenters stated that with technology-assisted analysis, aspects of a substantive analytical procedure may also be performed at an individual item level. Some commenters provided examples where the auditor uses a technology-assisted analysis to develop an expectation of recorded amounts for individual items in an account and aggregates the individual amounts to compare to the aggregated amount recorded by the company.

One commenter suggested clarifying the term “individual items” given the varying forms and level of disaggregation of data obtained for analysis by the auditor. This commenter suggested further clarifying that consideration be given to the objective of the audit procedure, the nature of the procedure to be applied, and the evidence necessary to meet the objective of the audit procedure. Another commenter sought additional information related to circumstances where a procedure would not be considered a test of details because it was not applied to individual items in an account.

Some commenters, mostly firms, expressed a preference that the standards not compare tests of details to analytical procedures. For example:

- A firm-related group stated that the proposed clarification was unnecessarily nuanced.
- Another commenter stated that the proposed description of analytical procedures as compared to tests of details was not accurate and could cause confusion.
- Other commenters stated that analytical procedures are clearly defined in PCAOB standards and are well understood by auditors, and that comparing tests of details to analytical procedures is unnecessary.
- Some commenters suggested evaluating the proposed amendments together with the Board’s standard-setting project to address substantive analytical procedures.

Other commenters stated that technology-assisted analysis continues to make classification of procedures between tests of details and analytical procedures more challenging because some procedures may exhibit characteristics of both types of procedures. These commenters suggested that the auditing standards focus on the sufficiency and appropriateness of evidence obtained from an audit procedure instead of clarifying the terminology of tests of details and analytical procedures. Some commenters also stated that the development of an expectation differentiates an analytical procedure from a test of details.

Having considered the comments received, we made several changes to the proposed description of a “test of details.” The final amendments state that a test of details involves performing audit procedures with respect to items included in an account or disclosure (e.g., the date, amount, or contractual terms of a transaction). When performing a test of details, the auditor should apply audit procedures that are appropriate to the particular audit objectives to each item selected for testing.

First, we relocated the description of a “test of details” and related requirements to a new section of AS 2301, in new paragraph .48. We believe that describing a test of details within AS 2301 is appropriate because tests of details are performed as substantive procedures to address assessed risks of material misstatement. The description uses the term “items included in an account or disclosure” instead of “individual items.” The change in terminology was made to more closely align with the description of items selected for testing in existing AS 1105.22-.23.

Second, we revised the amendment to clarify that when performing a test of details, the auditor should apply the audit procedures that are appropriate to the particular audit objectives to each item selected for testing. This provision focuses the auditor on the objectives of the audit procedures being performed and is consistent with existing requirements for audit sampling.²⁶ We believe that an emphasis on the objectives of the audit procedures, regardless of the means of selecting items for testing in the test of details, continues to be important and is aligned with the final amendments to AS 1105.14 (using an audit procedure for more than one purpose), which are discussed below in this release.²⁷

Lastly, the final amendments do not compare tests of details to analytical procedures, and we are not amending the existing description of analytical procedures in AS 1105.21. Because of the overlap between the description of analytical procedures and substantive analytical procedures, further potential amendments to the description of analytical procedures are being considered as part of the Board’s standard-setting project to address substantive analytical procedures.²⁸ In addition, comments we have received related to the auditor’s use of substantive analytical procedures are being taken into consideration in that project.

²⁶ See AS 2315.25.

²⁷ See Section III.B below.

²⁸ The Board has a separate standard-setting project on its short-term standard-setting agenda (<https://pcaobus.org/oversight/standards/standard-setting-research-projects>) related to substantive analytical procedures. In connection with that project, the Board has proposed changes to the auditor’s responsibilities regarding the use of substantive analytical procedures, including the requirements described in AS 2305 and AS 1105. See *Proposed Auditing Standard – Designing and Performing Substantive Analytical Procedures and Amendments to Other PCAOB Standards*, PCAOB Rel. No. 2024-006 (June 12, 2024) (included in PCAOB Rulemaking Docket No. 56).

The final amendments are not intended to define “items included in an account or disclosure” because such a definition is impractical given the variety of accounts and disclosures subject to tests of details. The auditor would determine the level of disaggregation or detail of the items within the account or disclosure based on the facts and circumstances of the individual audit engagement, including the assessed risk and the relevant assertion intended to be addressed, and the objective of the procedure.

In addition, we considered the comments suggesting that the amendments focus on the sufficiency and appropriateness of evidence obtained from performing audit procedures instead of describing categories of procedures. Considering current practice and the nature of audit procedures performed today, we continue to believe that the existing standards are sufficiently clear in describing auditors’ responsibilities for obtaining and evaluating audit evidence. Our ongoing research has not identified specific examples of substantive analytical procedures that, by themselves, would provide sufficient appropriate audit evidence to respond to a significant risk. Commenters also did not provide such examples. Therefore, we believe retaining the categories of procedures as tests of details and substantive analytical procedures continues to be appropriate.

2. Specifying Auditor Responsibilities When Investigating Items Identified

We proposed to add a new paragraph .37A to AS 2301 that specified matters for the auditor to consider when investigating items identified through using criteria established by the auditor in designing or performing substantive procedures on all or part of a population of items. Under the proposed paragraph, when the auditor establishes and uses criteria to identify items for further investigation, as part of designing or performing substantive procedures, the auditor’s investigation should consider whether the identified items:

- Provide audit evidence that contradicts the evidence upon which the original risk assessment was based;
- Indicate a previously unidentified risk of material misstatement;
- Represent a misstatement or indicate a deficiency in the design or operating effectiveness of a control; or
- Otherwise indicate a need to modify the auditor’s risk assessment or planned audit procedures.

The proposed requirement included a note providing that inquiry of management may assist the auditor and that the auditor should obtain audit evidence to evaluate the appropriateness of management’s responses.

We are adopting the proposed provisions with certain modifications as discussed further below, including relocating the requirements from proposed paragraph .37A to new

paragraphs .49 and .50 in AS 2301. We also made a conforming amendment to paragraph .10 of AS 2301 to include a reference to paragraphs .48 through .50.

As discussed above in Section II.B, designing substantive tests of details and tests of controls includes determining the means of selecting items for testing. The alternative means of selecting items for testing consist of selecting all items; selecting specific items; and audit sampling. As discussed in the proposal, our research has indicated that auditors use technology-assisted analysis to identify specific items within a population (e.g., an account or class of transactions) for further investigation. For example, auditors may identify all revenue transactions above a certain amount, transactions processed by certain individuals, or transactions where the shipping date does not match the date of the invoice. Because technology-assisted analysis may enable the auditor to examine all items in a population, it is possible that the analysis may return dozens or even hundreds of items within the population that meet one or more criteria established by the auditor.

Considering current practice, we stated in the proposal that PCAOB standards should be modified to address the auditor's responsibilities in such scenarios more directly. The auditor's appropriate investigation of identified items is important both for identifying and assessing the risks of material misstatement and for designing and implementing appropriate responses to the identified risks.

Commenters were supportive of the principles-based nature of the proposed amendment and agreed with the Board's decision not to prescribe the nature, timing, or extent of investigation procedures. However, commenters also asked for further clarification, guidance, and examples to address different scenarios that the auditor encounters when 100 percent of a population is tested, given that certain requirements in proposed AS 2301.37A exist in the standards today. Some commenters said it was unclear how proposed AS 2301.37A was different from requirements in existing standards related to the auditor's ongoing risk assessment, and the auditor's responsibility to revise their risk assessment under certain scenarios and to evaluate the results of audit procedures. Several commenters noted that existing standards address auditors' responsibilities when investigating items under certain scenarios. These commenters observed, for example, that AS 2110, *Identifying and Assessing Risks of Material Misstatement*, applies when the auditor uses technology-assisted analysis to identify and assess risks of material misstatement, and AS 2110.74 and AS 2301.46 apply when the items identified by the auditor when using technology-assisted analysis indicate a new risk of misstatement or a need to modify the auditor's risk assessment. One commenter asked whether identifying items for further investigation was intended to describe only scenarios where specific items are selected for testing.

One commenter noted that the proposed amendment implied that technology-assisted analysis could be used only for purposes of risk assessment or selecting specific items for testing. Another commenter stated that it is important for the auditor's investigation of items to include determining whether there is a control deficiency.

Several commenters asked that we clarify whether sampling can be applied to items identified for investigation or whether the auditor is expected to test 100 percent of the identified items. Some commenters also asked us to clarify whether the evidence obtained would be considered sufficient and appropriate, or if the auditor would be required to perform further procedures, in situations where a technology-assisted analysis over an entire population (e.g., matching quantities invoiced to quantities shipped) did not identify any items for investigation. One commenter recommended that the amendments be extended to address the auditor's responsibilities over other items in the population not identified for investigation. Two commenters asked us to clarify how the proposed amendment and existing standard would apply when the technology-assisted analysis is modified after the original analysis is complete.

Consistent with the proposal, the final requirements are principles-based and intended to be applied to all means of selecting items for a test of details (e.g., selecting all items, selecting specific items, and audit sampling). We continue to believe that appropriately addressing the items identified by the auditor for further investigation in a test of details is an important part of obtaining sufficient appropriate audit evidence, because these items individually or in the aggregate may indicate misstatements or deficiencies in the design or operating effectiveness of a control. In response to comments received, the final amendments reflect several modifications from the proposal.

First, we have reframed the requirements to focus on the auditor's investigation of items when performing a test of details as part of the auditor's response to assessed risks. We narrowed the requirement to apply only to tests of details because, as commenters noted, existing PCAOB standards describe the auditor's responsibility to investigate items identified when performing substantive analytical procedures.²⁹ In addition, we did not repeat the considerations related to the auditor's risk assessment that are required under existing PCAOB standards as described above. We believe these changes alleviate potential confusion about how the requirements are intended to be applied. We also removed the proposed note requiring the auditor to obtain audit evidence when evaluating the appropriateness of management's responses to inquiries, because existing PCAOB standards already address this point by noting that inquiry alone does not provide sufficient appropriate evidence to support a conclusion about a relevant assertion.³⁰

Second, the requirements have been relocated into two new paragraphs (.49 and .50) in AS 2301, which are designed to work together. Paragraph .49 applies to all tests of details, regardless of the means of selecting items used by the auditor. The requirement states that when performing a test of details, the auditor may identify items for further investigation. For

²⁹ See AS 2305.20-.21 (providing that the auditor should evaluate significant unexpected differences when performing a substantive analytical procedure). See also PCAOB Rel. No. 2024-006 (proposing amendments to AS 2305).

³⁰ See AS 1105.17 and AS 2301.39.

example, an auditor may identify balances or transactions that contain, or do not contain, a certain characteristic or that are valued outside of a range. The final amendment emphasizes that when such items are identified, audit procedures that the auditor performs to investigate the identified items are part of the auditor's response to the risks of material misstatement. The auditor determines the nature, timing, and extent of such procedures in accordance with PCAOB standards. The final amendment also provides that the auditor's investigation of the identified items should include determining whether the items individually or in the aggregate indicate (i) misstatements that should be evaluated in accordance with AS 2810 or (ii) deficiencies in the company's internal control over financial reporting.

When the auditor identifies items for further investigation in a test of details, the final amendment does not prescribe the nature, timing, and extent of audit procedures to be performed regarding the identified items, including whether those procedures are performed on the items individually or in the aggregate. Prescribing specific procedures would be impracticable considering the multitude of possible scenarios encountered in practice. The nature of the identified items and likely sources of potential misstatements are examples of factors that would inform the auditor's approach. To comply with PCAOB standards, the nature, timing, and extent of the audit procedures performed, including the means of selecting items, should enable the auditor to obtain evidence that, in combination with other relevant evidence, is sufficient to meet the objective of the test of details.

In some cases, an auditor may be able to group the identified items (e.g., items with a common characteristic) and perform additional audit procedures to determine whether the items indicate misstatements or control deficiencies by group.³¹ In other cases, it may not be appropriate to group the items identified for investigation.³² Further, the auditor's investigation could also identify new relevant information (e.g., regarding the types of potential misstatements) and the auditor may need to modify the audit response.

When a test of details is performed on specific items selected by the auditor,³³ the final amendments discuss the auditor's responsibilities for addressing the remaining items in the population. When the auditor selects specific items in an account or disclosure for testing, new paragraph .50 provides that the auditor should determine whether there is a reasonable possibility that remaining items within the account or disclosure include a misstatement that,

³¹ For example, in a test of revenue, the auditor may discover that the identified differences between customer invoices and payments are caused by variations in the exchange rate, but such differences are both in accordance with the terms of the customer contracts and appropriately accounted for by the company. In this example, grouping the differences for the purpose of performing additional procedures may be appropriate.

³² For example, in circumstances where the identified items are unrelated to each other, it may not be appropriate for the auditor to group these items for the purpose of performing additional procedures.

³³ See AS 1105.25-.27.

individually or when aggregated with others, would have a material effect on the financial statements.³⁴ If the auditor determines that there is a reasonable possibility of such a risk of material misstatement in the items not selected for testing, the auditor should perform substantive procedures that address the assessed risk.³⁵ As discussed in the proposing release, the auditor's responsibilities over other items in the population are described in existing PCAOB standards, and the final requirement (AS 2301.50) reminds the auditor of those responsibilities.

The final amendments do not specify, as suggested by some commenters, whether the evidence obtained would be considered sufficient and appropriate, or whether the auditor would be required to perform further procedures, in situations where a technology-assisted analysis over an entire population did not identify any items for investigation. Because facts and circumstances vary, it is not possible to specify scenarios that would provide sufficient appropriate audit evidence. Consistent with existing standards, for an individual assertion, different types and combinations of substantive procedures might be necessary to detect material misstatements in the respective assertions.³⁶ For example, in addition to performing a technology-assisted analysis of company-produced information to match quantities invoiced to quantities shipped, other audit procedures, such as examining a sample of information that the company received from external sources (e.g., purchase orders and cash receipts), may be necessary to obtain sufficient appropriate audit evidence for the relevant assertion. The auditor would be required to document the purpose, objectives, evidence obtained, and conclusions reached from the procedures in accordance with the existing provisions of AS 1215, *Audit Documentation*.³⁷

B. Specifying Auditor Responsibilities When Using an Audit Procedure for More Than One Purpose

See paragraph .14 of AS 1105 of the amendments in Appendix 1.

We proposed to amend paragraph .14 of AS 1105 by adding a sentence to specify that if an auditor uses audit evidence from an audit procedure for more than one purpose, the auditor should design and perform the procedure to achieve each of the relevant objectives of the procedure.

The proposed amendment was intended to supplement existing PCAOB standards because our research indicated that: (i) technology-assisted analysis could be used in a variety of audit procedures, including risk assessment and further audit procedures (such as tests of details and substantive analytical procedures); (ii) an audit procedure that involves

³⁴ See AS 2110.

³⁵ See AS 2301.08 and .36.

³⁶ See AS 2301.40.

³⁷ See AS 1215.04-.06.

technology-assisted analysis may provide relevant and reliable evidence for more than one purpose (e.g., identifying and assessing risks of material misstatement and addressing assessed risks); and (iii) questions have been raised about whether the evidence obtained from an audit procedure that involves technology-assisted analysis can be used for more than one purpose. We are adopting the amendment substantially as proposed, with certain modifications to clarify and simplify the sentence, as discussed below. As amended, the sentence added to paragraph .14 provides that “[i]f the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure.”

Under existing PCAOB standards, the purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.³⁸ Although AS 1105 describes specific audit procedures, it does not specify whether an audit procedure may be designed to achieve more than one purpose; nor does it preclude the auditor from designing and performing multi-purpose audit procedures.³⁹ In fact, other PCAOB standards have long permitted auditors to use audit evidence for more than one purpose through the performance of properly designed “dual-purpose” procedures in certain scenarios.⁴⁰

Considering the variety of applications of technology-assisted analysis throughout the audit, we stated in the proposal that PCAOB standards could be modified to more specifically address when an auditor uses audit evidence from an audit procedure for more than one purpose, to facilitate the auditor’s design and performance of audit procedures that provide sufficient appropriate audit evidence. The proposal explained that audit procedures involving technology-assisted analysis are not always multi-purpose procedures. For example, a technology-assisted analysis that is used to analyze a population of revenue transactions to identify significant new products may provide audit evidence only to assist the auditor with identifying and assessing risks (a risk assessment procedure). But if the procedure also involves obtaining audit evidence to address the risk of material misstatement associated with the occurrence of revenue, the procedure would be a multi-purpose procedure.

Commenters, including an investor-related group, supported the objective of the amendment to specify the auditor’s responsibilities when using audit evidence for more than one purpose. One commenter stated that the proposed amendment appears to prohibit an

³⁸ See AS 1105.14.

³⁹ This interpretation was highlighted in a 2020 PCAOB staff publication. See PCAOB, *Spotlight: Data and Technology Research Project Update* (May 2020), at 4, available at <https://pcaobus.org/Documents/Data-Technology-Project-Spotlight.pdf>.

⁴⁰ See, e.g., AS 2110.39 (“The auditor may obtain an understanding of internal control concurrently with performing tests of controls if he or she obtains sufficient appropriate evidence to achieve the objectives of both procedures”) and AS 2301.47 (discussing performance of a substantive test of a transaction concurrently with a test of a control relevant to that transaction (a “dual-purpose test”).

auditor from using audit evidence obtained later in the audit. In that commenter's view, the amendment implied that the auditor must intend to use the audit procedure for more than one purpose, which could be viewed as contradicting the principle that risk assessment should continue throughout the audit.

Several commenters stated that the proposed amendment implied that, for an auditor to use audit evidence for more than one purpose, the auditor would need to know all of the purposes initially when designing the procedure. These commenters added that audit procedures that use technology-assisted analysis can be more iterative in nature and may not be designed for all the purposes that they ultimately fulfill through the nature of the evidence they generate. For example, one commenter noted that when using technology-assisted analysis to substantively test a population of transactions, the auditor may identify a sub-population of transactions that exhibit different characteristics than the rest of the population and use that information to modify the risk assessment of the sub-population. Another commenter noted that an audit procedure may be designed as a risk assessment procedure, but the technology-assisted analysis may provide audit evidence for assertions about classes of transactions or account balances or other evidence regarding the completeness and accuracy of information produced by the company used in the performance of other audit procedures. These commenters suggested that the amendment be revised by focusing on evaluating the audit evidence obtained from the procedure.

The proposed amendment was not intended to imply that the auditor should not evaluate or consider information obtained from an audit procedure that the auditor was not aware of when initially designing the procedure or that the auditor obtains after a procedure is completed. As noted in the proposal, an auditor may use audit evidence from an audit procedure that involves technology-assisted analysis to achieve one or more objectives, depending on the facts and circumstances of the company and the audit. Further, the auditor would be required to consider and evaluate such information under existing PCAOB standards. For example, as one commenter noted, existing AS 1105 states that audit evidence is all the information, whether obtained from audit procedures or other sources, that is used by the auditor in arriving at the conclusions on which the auditor's opinion is based.⁴¹ Another commenter observed that existing PCAOB standards provide that the auditor's assessment of the risks of material misstatement, including fraud risks, continues throughout the audit.⁴²

We continue to believe that in order for an auditor to use an audit procedure for more than one purpose (i.e., as more than a risk assessment procedure, test of controls, or substantive procedure alone), the auditor would need to determine that each of the objectives of the procedure has been achieved. Therefore, after considering the comments received, we retained the requirement but removed the reference to "design and perform the procedure."

⁴¹ See AS 1105.02.

⁴² See, e.g., AS 2110.74 and AS 2301.46.

The auditor’s responsibilities for designing and performing procedures are already addressed in AS 2110 and AS 2301. Therefore, the final amendment to paragraph .14 of AS 1105 states that “[i]f the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure.”

As noted in the proposal, the purpose, objective, and results of multi-purpose procedures should be clearly documented. Under existing PCAOB standards, audit documentation must contain sufficient information to enable an experienced auditor, having no previous connection with the engagement, to understand the nature, timing, extent, and results of the procedures performed, evidence obtained, and conclusions reached.⁴³ Accordingly, audit documentation should make clear each purpose of the multi-purpose procedure, the results of the procedure, the evidence obtained, the conclusions reached, and how the auditor achieved each objective of the procedure.

Commenters were supportive of acknowledging the auditor’s documentation responsibilities when using audit evidence for more than one purpose. An investor-related group commented that the audit planning documentation should support how each procedure will achieve each objective and that the audit work papers should document that the work performed achieved each objective. Another commenter also concurred with the notion that the purpose, objective, and results of multi-purpose procedures should be clearly documented. One commenter noted it was unclear whether there are any incremental documentation expectations in comparison to current practice.

Under PCAOB standards, audit documentation should be prepared in sufficient detail to provide a clear understanding of its purpose, source, and the conclusions reached.⁴⁴ This applies also for procedures performed that involve technology-assisted analysis. Therefore, we believe that specifying further documentation requirements is unnecessary.

Some commenters suggested that we provide an example of using audit evidence from an audit procedure to achieve more than one purpose, including two commenters suggesting an example similar to examples issued by the American Institute of Certified Public Accountants (“AICPA”).⁴⁵ Given the evolving nature of the auditor’s use of technology, we have not included a specific example in the text of the final amendments to AS 1105.14. The proposing release, however, discussed an example where a technology-assisted analysis of accounts related to the procurement process could both: (i) provide the auditor with insights into the volume of payments made to new vendors (e.g., a risk assessment procedure to identify new or different risks); and (ii) match approved purchase orders to invoices received and payments made for

⁴³ See AS 1215.04-.06.

⁴⁴ See AS 1215.04.

⁴⁵ Examples referenced by commenters included examples issued by the AICPA in AU-C 500, *Audit Evidence*.

each item within a population (e.g., a test of details to address an assessed risk associated with the occurrence of expenses and obligations of liabilities).⁴⁶ We believe this example illustrates how auditors would apply the principles-based amendments consistently. If the procedure performed does not achieve each of the intended objectives, other procedures would need to be performed (e.g., other substantive procedures to address assessed risks of material misstatement).

Lastly, two commenters suggested that we clarify that the specific audit procedures discussed in AS 1105.14 are not an all-inclusive list, to allow for the use of additional types of procedures, or combination of procedures, in the future as technology evolves. We believe the existing language is sufficiently clear because it does not indicate that the specific audit procedures described in the standard are the only types of audit procedures the auditor can perform.

C. Specifying Auditor Responsibilities for Evaluating the Reliability of Certain Audit Evidence and Emphasizing the Importance of Appropriate Disaggregation or Detail of Information

See paragraphs .07, .08, .10, .10A, .15, .19, and .A8 of AS 1105 of the amendments in Appendix 1.

1. Evaluating the Reliability of External Information Provided by the Company in Electronic Form

We proposed to add paragraph .10A to AS 1105 to specify the auditor's responsibility for performing procedures to evaluate the reliability of external information maintained by the company in electronic form when using such information as audit evidence. The proposed paragraph provided that the auditor should evaluate whether such information is reliable for purposes of the audit by performing procedures to: (a) obtain an understanding of the source of the information and the company's procedures by which such information is received, recorded, maintained, and processed in the company's information systems; and (b) test controls (including information technology general controls and automated application controls) over the company's procedures or test the company's procedures.

We are adopting the amendments substantially as proposed with certain modifications discussed below. We also made a conforming amendment to footnote 5 of paragraph .A8 of AS 1105 to include a reference to paragraph .10A.

We noted in the proposal that, based on our research, auditors often obtain from companies, and use in the performance of audit procedures, information in electronic form. In many instances, companies have obtained the information from one or more external sources.

⁴⁶ See Proposing Release at 19.

PCAOB standards do not include specific requirements regarding information received by the company from external sources, maintained and in many instances processed by the company, and then included in the information provided to the auditor in electronic form to be used as audit evidence.⁴⁷ Because this information is maintained and potentially can be modified by the company, we proposed to amend our standards to address this risk to the reliability of audit evidence that the auditor obtains through using this type of information.

Commenters on this topic, including an investor-related group, supported our objective of addressing the risks that information the company receives from one or more external sources and provides to the auditor in electronic form to use as audit evidence may not be reliable and may have been modified by the company. However, several commenters also stated that further clarification of the requirements was needed:

- Some commenters asked for clarification about the information the company received from one or more external sources and “maintained in its information systems” in electronic form. A few of those commenters also asked whether the use of “its information systems” was intended to be the same as the “information system relevant to financial reporting” in AS 2110.⁴⁸ Several commenters suggested clarifying the proposed examples of the types of information subject to these requirements that were included in the proposed footnote to AS 1105.10A and providing more specific examples, such as a bank statement in PDF format.
- One commenter noted that the proposed amendment may not clarify the difference between maintaining the reliability of the external information received by the company and what the company does with that information after it is received. The commenter noted that after external information has been received, it is often recorded into the company’s information system where it is moved, processed, and changed to the point that it is no longer considered external information, but rather information produced by the company and subject to transactional processes and controls. Another commenter stated that the requirements should not focus on accuracy and completeness because the information is provided to the company from an external source.
- A number of commenters stated that the proposed amendment, specifically the requirement in AS 1105.10A to test controls over procedures or test the company’s procedures themselves, implied that the auditor had to test the effectiveness of internal controls in order for the information to be determined

⁴⁷ For example, the company may receive information from a customer in the form of a purchase order and provide that information to the auditor in electronic form.

⁴⁸ See AS 2110.28.

to be reliable. Many of these commenters asked for clarification of the distinction between testing the company's controls and testing the company's procedures. One commenter noted that certain smaller and mid-sized companies may not have implemented controls that can be tested. Some commenters added that, because the proposed amendments did not include "where applicable" related to information technology general controls ("ITGCs") and automated application controls, the proposed amendments implied that ITGCs and automated application controls always needed to be tested and effective. Several of these commenters also provided examples of scenarios where ITGCs and automated application controls may not need to be tested, such as controls that reconcile information in the company's information systems to the information the company received from the external source. Commenters also asked whether information from an external source provided by the company can be tested directly (i.e., not testing a company's controls) and stated that it would be helpful to clarify expectations of the auditor's work effort when evaluating the reliability of such information.

- One commenter indicated that it was unclear how the requirements of footnote 3 of AS 1105.10 and proposed AS 1105.10A interrelate when using information produced by a service organization. Footnote 3 of AS 1105 refers the auditor to responsibilities under AS 2601, *Consideration of an Entity's Use of a Service Organization*, and in an integrated audit, AS 2201, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*, when using information produced by a service organization as audit evidence.
- An investor-related group commented that, in addition to the requirements for the auditor to evaluate the reliability of external information provided by the company in electronic form, the auditor should also be required to evaluate the reliability of digital information maintained outside the company and used by the auditor as audit evidence. Another commenter suggested that the auditor's requirements should also address information obtained directly by the auditor from external sources.

In consideration of comments received, we made several modifications to the final amendments, which are described in more detail below. The final amendment (paragraph .10A) provides that the auditor should evaluate whether external information provided by the company in electronic form and used as audit evidence is reliable by:

- a. Obtaining an understanding of (i) the source from which the company received the information; and (ii) the company's process by which the information was received, maintained, and, where applicable, processed, which includes understanding the

nature of any modifications made to the information before it was provided to the auditor; and

- b. Testing the information to determine whether it has been modified by the company and evaluating the effect of those modifications; or testing controls over receiving, maintaining, and processing the information (including, where applicable, information technology general controls and automated application controls).

As discussed above, the proposed amendments described auditor responsibilities related to evaluating the reliability of information in electronic form provided by the company to the auditor that the company received from external sources. Examples of such information include, but are not limited to, bank statements, customer order information, information related to cash receipts, and shipping information from third-party carriers provided to the auditor in electronic form.

We believe that a principles-based description of the information subject to the requirement that does not list specific types of information, as suggested by some commenters, is in the best interest of audit quality and investor protection. This approach is adaptable to evolving sources and forms of electronic information, considering continued advancements in technology. We have clarified the final amendment by removing the reference to “maintained in the company’s information systems,” which confused some commenters. The use of this term in the proposal was intended to refer broadly to information in electronic form within a company that the company could provide to the auditor.

We have revised subparagraph (a) of the final amendment to replace the term “company’s procedures” with “company’s process.” In the proposal we used “company’s procedures” to align with AS 2110.28(b), which describes the company’s procedures to initiate, authorize, process, and record transactions. However, we believe use of the “company’s process” is more consistent with AS 2110.30 and .31, which describe the company’s business processes that the auditor is required to understand. We also believe that using “company’s process” clarifies that the intent of the requirement is to understand the flow of the information from the time the company received it from the external source until the company provided it to the auditor. Additional refinements made to this requirement include (i) removing the word “recorded” because receiving, processing, and maintaining data would encompass recording it; and (ii) adding “where applicable” to address examples provided by commenters where companies receive information from external sources that may be maintained only – and not processed – by the company.

We have also made revisions to clarify that, as part of understanding how the information received from external sources is processed by the company, the auditor should obtain an understanding of the nature of any modifications made to the information. This revision focuses the auditor on identifying the circumstances where the information may have been modified or changed by the company.

We did not intend to imply that internal controls are required to be tested and effective in order for the auditor to be able to determine that external information is reliable for purposes of the audit, as suggested by some commenters. Rather, the proposed amendment was meant to (i) clarify the auditor's responsibility for performing procedures to evaluate the reliability of audit evidence; and (ii) address the risk that the company may have modified the external information prior to providing it to the auditor for use as audit evidence.

We revised the final amendment in subparagraph (b) to require that the auditor (i) test the information to determine whether it has been modified by the company and evaluate the effect of those modifications; or (ii) test controls over receiving, maintaining, and where applicable, processing the information. As discussed in the proposing release, the auditor may determine the information has been modified by the company by either comparing the information provided to the auditor to (i) the information the company received from the external source; or (ii) information obtained directly by the auditor from external sources. Some commenters referred to comparing the information provided by the company to the information the company received from the external source, as testing the information "directly" for reliability.

For example, the auditor may obtain customer purchase order information from the company's information systems and compare this information to the original purchase order submitted by the customer to determine whether any modifications were made by the company. In another example, the auditor may obtain interest rate information from the company's information systems and compare it to the original information from the U.S. Department of Treasury. Under the final amendments, if the auditor determines modifications were made by the company, the auditor would have to evaluate the effect of the modifications on the reliability of the information. For example, the auditor may determine that certain modifications (e.g., formatting of the date of a transaction from the European date format to the U.S. date format) have not affected the reliability of the information. Conversely, the auditor may determine that inadvertent or intentional deletions, or improper alterations of key data elements by the company (e.g., customer details, transaction amount, product quantity) have negatively affected the reliability of information.

Finally, we have further clarified the amendment to indicate that if the auditor chooses to test controls instead of testing the information as described above, the auditor should test controls over the receiving, maintaining, and where applicable, processing of the information that are relevant to the auditor's evaluation of whether the information is reliable for purposes of the audit. This aligns with our intent in the proposal that described testing controls over the company's procedures. Controls over processing the information would include internal controls over any modifications made by the company to the information.

Several commenters noted that in instances where controls over the information are ineffective, or are not implemented or formalized, the auditor may need to perform procedures other than testing internal controls to determine the reliability of the information provided by

the company. In response to these comments, we believe it is important to remind auditors that PCAOB standards already address circumstances when the auditor encounters ineffective controls, or controls that are not implemented or formalized. It is important for the auditor to also understand the implications of such findings on the nature, timing, and extent of procedures that the auditor needs to perform in accordance with PCAOB standards.⁴⁹

We also considered the comments related to specifying requirements for the auditor to evaluate the reliability of external information obtained directly by the auditor from external sources, which would include digital information maintained outside the company and used as audit evidence. Under existing standards, audit evidence must be reliable, and its reliability depends on the nature and the source of the evidence and the circumstances under which it is obtained.⁵⁰ In light of the existing requirements within AS 1105, we believe that the auditor's responsibilities to evaluate the reliability of information obtained from external sources are sufficiently clear and that further amendments to address information obtained by the auditor directly from external sources are not necessary. In addition, the Board considered, but decided not to address in this project, auditors' responsibilities related to using information produced by a service organization as audit evidence.⁵¹

Further, as discussed below, the Board's proposed amendment was intended to highlight the importance of controls over information technology. We considered the comments received, and the final amendment clarifies that ITGCs and automated application controls should be tested where applicable (e.g., where controls are selected for testing or where a significant amount of information supporting one or more relevant assertions is electronically initiated, recorded, processed, or reported).⁵² We believe testing ITGCs and automated application controls is important to mitigate the risk that the information provided by the company in electronic form is not reliable. In some cases, the auditor may already be testing the relevant ITGCs and automated application controls, while in other cases the auditor may need to test additional controls.

⁴⁹ See, e.g., AS 1105.08, AS 2110.25 and .B1-.B6, and AS 2301.32-.34.

⁵⁰ See AS 1105.06 and AS 1105.08. See also PCAOB, *Staff Guidance – Insights for Auditors Evaluating the Relevance and Reliability of Audit Evidence Obtained From External Sources* (Oct. 2021), available at https://assets.pcaobus.org/pcaob-dev/docs/default-source/standards/documents/evaluating-relevance-and-reliability-of-audit-evidence-obtained-from-external-sources.pdf?sfvrsn=48b638b_6.

⁵¹ See AS 2601 for the auditor's requirements related to the use of a service organization. The Board has a separate standard-setting project on its mid-term standard-setting agenda (<https://pcaobus.org/oversight/standards/standard-setting-research-projects>) related to the use of a service organization, which may result in changes to AS 2601 and the auditor's responsibilities regarding the use of a service organization.

⁵² See, e.g., AS 2301.17.

Consistent with the proposal, we are not prescribing the nature, timing, or extent of the auditor's procedures to evaluate the reliability of the external information. An auditor would design the procedures considering the wide variety of types of external information received by companies and differences in the processes for receiving, maintaining and, where applicable, processing such information. Further, the nature, timing, and extent of the auditor's procedures would depend on the purpose for which the auditor uses the information whose reliability is being evaluated. In general, performing audit procedures to address the risks of material misstatement involves obtaining more persuasive evidence than in performing risk assessment procedures.⁵³ Accordingly, evaluating the reliability of information used in substantive procedures and tests of controls would require more auditor effort than evaluating the reliability of information used in risk assessment procedures.

2. Emphasizing the Importance of Controls Over Information Technology

We proposed several amendments to AS 1105 to emphasize the importance of controls over information technology for the reliability of audit evidence. As noted above, auditors obtain from companies, and use in the performance of audit procedures, large volumes of information in electronic form. The reliability of such information is increased when the company's controls over that information – including, where applicable, ITGCs and automated application controls – are effective. We are adopting the amendments to paragraph .10 of AS 1105 as proposed, and amendments to paragraphs .08 and .15 of AS 1105 substantially as proposed, with minor modifications as described below.

Commenters on this topic supported the objective of emphasizing the importance of controls over information technology in establishing reliability of information used as audit evidence. Several commenters opined that the proposed amendments, more specifically the proposed amendments to paragraph .15 of AS 1105, implied that internal controls, including ITGCs and automated application controls, would need to be tested and determined effective in order to determine that the information is reliable.

The proposed amendments were not intended to imply that (i) internal controls are required to be tested and effective in order for the auditor to be able to determine that information is reliable for purposes of the audit; or (ii) testing other relevant controls is less important or unnecessary. Rather, the proposed amendments were meant to highlight to the auditor that certain information is more reliable when internal controls are effective, and where applicable, those internal controls include ITGCs and automated application controls, which is consistent with existing PCAOB standards.⁵⁴ Our standards also describe scenarios

⁵³ See generally AS 2301.09(a), .18, and .39.

⁵⁴ See existing AS 1105.08.

where the sufficiency and appropriateness of the audit evidence usually depends on the effectiveness of controls.⁵⁵ The amendments did not change these existing principles.

Further, in the proposing release we explained that the proposed amendments state “where applicable” in relation to the controls over information technology because information produced by the company may also include information that is not in electronic form, or information that is subject to manual controls. One commenter noted that this explanation was informative and suggested incorporating it into the amendments. Another commenter also recommended defining “where applicable” with clear factors or examples of when ITGCs and automated application controls would be applicable. Because of the wide variety of types and sources of information, and ways in which companies use information, it would be impracticable to specify scenarios where ITGCs and automated application controls would be applicable.

Having considered the above comments and the Board’s intent to retain the existing principle in paragraph .08 of AS 1105 that certain information is more reliable when controls are effective, we have modified paragraph .15 of AS 1105 within the final amendments to align the language with AS 1105.08. In addition, the final amendments to paragraph .08 have also been aligned with the terminology in paragraph .10A of AS 1105 described above.

Lastly, separate from commenting on the proposed amendments to paragraph .08 of AS 1105 discussed above, some commenters suggested amendments to modernize the last bullet point of the paragraph, which describes that evidence from original documents is more reliable. Three commenters asserted that the information may exist in different forms (e.g., paper or electronic form) and may be in a format other than a document (e.g., unprocessed data). In the views of two of these commenters, no physical or original document exists when an electronic data transmission from a customer initiates a transaction in a company’s ERP system. These commenters suggested modernizing the language to focus on the original form of the audit evidence and any subsequent conversion, copying, or other modifications. We have considered the comments received but are not amending the language because the bullet points in paragraph .08 of AS 1105 are intended to be examples of factors that may affect the reliability of audit evidence. The existing language provides an example of one type of audit evidence – original documents that have not been converted, copied, or otherwise modified – which is consistent with the principles suggested by the commenters.

3. Emphasizing the Importance of Appropriate Disaggregation or Detail of Information

We proposed to amend paragraph .07 of AS 1105 to emphasize that the relevance of audit evidence depends on the level of disaggregation or detail of information necessary to achieve the objective of the audit procedure. Whether an auditor performs tests of details,

⁵⁵ See, e.g., AS 2301.17.

substantive analytical procedures, or other tests, technology-assisted analysis may enable the auditor to analyze large volumes of information at various levels of disaggregation (e.g., regional or global) or detail (e.g., relevant characteristics of individual items such as product type or company division). The appropriate level of disaggregation or detail of information that the auditor uses as audit evidence is important for obtaining audit evidence that is relevant in supporting the auditor's conclusions.⁵⁶ Having considered the comments received, we are adopting the amendment as proposed.

The level of disaggregation or detail that is appropriate depends on the objective of the audit procedure. For example, when testing the valuation assertion of residential loans that are measured based on the fair value of the collateral, disaggregated sales data for residential properties by geographic location would likely provide more relevant audit evidence than combined sales data for both commercial and residential properties by geographic location. In another example, when performing a substantive analytical procedure and analyzing the plausibility of relationships between revenue and other information recorded by the company, using revenue disaggregated by product type would likely be more relevant for the auditor's analysis and result in obtaining more relevant audit evidence than if the auditor used the amount of revenue in the aggregate.

Commenters on this topic were supportive of the proposed amendment and indicated that it aligned with current practice. Some of these commenters suggested providing examples, stating that examples would help auditors in understanding and applying the amendment. Consistent with the proposal, the final amendment does not prescribe an expected level of disaggregation or detail, as auditor judgment is needed to determine the relevance of information based on the objective of the audit procedure.

4. Updating Certain Terminology in AS 1105

We proposed to update certain terminology used to describe audit procedures for obtaining audit evidence in AS 1105, without changing the meaning of the corresponding requirements. For example, considering the greater availability and use of information in electronic form, we proposed to use the term "information" instead of the term "documents and records" in AS 1105.15 and .19. Further, to avoid a misinterpretation that only certain procedures could be performed electronically, we proposed to remove the reference to performing recalculation "manually or electronically" in AS 1105.19. For consistent terminology, we also proposed to replace the terms "generated internally by the company" in AS 1105.08 and "internal" in AS 1105.15 with the term "produced by the company." Having considered the

⁵⁶ See, e.g., PCAOB, *Staff Guidance – Insights for Auditors Evaluating the Relevance and Reliability of Audit Evidence Obtained From External Sources* (Oct. 2021) at 5, available at https://assets.pcaobus.org/pcaob-dev/docs/default-source/standards/documents/evaluating-relevance-and-reliability-of-audit-evidence-obtained-from-external-sources.pdf?sfvrsn=48b638b_6.

comments received, we are adopting the amendments to paragraphs .08, .15, and .19 of AS 1105 as proposed.

Commenters on this topic supported the updates to certain terminology described above, and stated the updated terminology appears clear and appropriate. One commenter suggested modifying the terminology in paragraph .19 from “checking” to “testing” because testing more clearly describes an audit procedure that is being performed over the mathematical accuracy of information. Having considered the comment, we are retaining the existing terminology in paragraph .19 of “checking” to avoid a potential for confusion with test of details.

IV. ECONOMIC ANALYSIS

The Board is mindful of the economic impacts of its standard setting. This section describes the economic baseline, economic need, expected economic impacts of the final amendments, and alternative approaches considered. There are limited data and research findings available to estimate quantitatively the economic impacts of the final amendments. Therefore, the Board’s economic discussion is largely qualitative in nature. However, where reasonable and feasible, the analysis incorporates quantitative information, including descriptive statistics on the tools that firms use in technology-assisted analysis.⁵⁷

A. Baseline

Section II above describes important components of the baseline against which the economic impact of the final amendments can be considered, including the Board’s existing standards, firms’ current practices, and observations from the Board’s oversight activities. We discuss below two additional aspects of current practice that inform our understanding of the economic baseline: (i) the PCAOB staff’s analysis of the tools that auditors use in technology-assisted analysis; and (ii) research on auditors’ use of technology-assisted analysis.

1. Staff Analysis of Tools that Auditors Use in Technology-Assisted Analysis

PCAOB staff reviewed information provided by firms pursuant to the PCAOB’s oversight activities regarding tools they use in technology-assisted analysis. The information identifies and describes tools used by audit engagement teams. The staff reviewed information provided

⁵⁷ As noted above, this release uses the term “technology-assisted analysis” in reference to the analysis of information in electronic form that is performed with the assistance of technology-based tools. Others, including firms and academics, may refer to such analysis as “data analysis” or “data analytics.” The use of “data analysis” or “data analytics” in Section IV of the release is intended to align with terminology used by the source cited. The terms “data analysis” or “data analytics” should not be confused with the term “analytical procedures” that is used in PCAOB standards to refer to a specific type of audit procedure (*see* AS 1105.21) that may be performed with or without the use of information in electronic form or technology-based data analysis tools.

by the U.S. global network firms (“GNFs”) as well as seven U.S. non-affiliated firms (“NAFs”).⁵⁸ The information was first provided for the 2018 inspection year and is available through the 2023 inspection year for the GNFs and NAFs analyzed.

Firms reported using both internally developed and externally purchased tools. Some of the externally purchased tools were customized by the firms. The nature and number of tools varied across firms, and their use varied with the facts and circumstances of specific audit engagements. Some firms describe their tools by individual use case or functionality based on how the tool has been tailored by the firm (e.g., one tool to test accounts receivable and another tool to test inventory using the same software program), and other firms describe their tools grouped by software program, thus affecting the number of unique tools reported by the firms. Some firms consolidated some of their tools over time, thus reducing the number of unique tools they used, although the number of audit engagements on which tools are used has not decreased. For example, instead of having separate tools to perform technology-assisted analysis and analytical procedures performed as part of the auditor’s risk assessment, some firms have consolidated both functions into one tool. Firms generally do not require the use of such tools on audit engagements.

The average number of tools used by audit engagement teams, as reported to the PCAOB by the U.S. GNFs, increased from approximately 13 to approximately 18 per firm, or approximately 38%, between 2018 and 2023. In the 2023 inspection year, U.S. GNFs reported that 90% of their tools are used for data visualization, summarization, tabulation, or modeling.⁵⁹ All the U.S. GNFs reported using tools to assist in: (i) identifying and selecting journal entries; and (ii) selecting samples for testing. The U.S. GNFs reported having tools that support both risk assessment (e.g., assessing loan risk) and substantive procedures (e.g., performing journal entry testing or fair value testing). The U.S. GNFs developed approximately 75% of the reported tools in-house while the rest were purchased externally. Furthermore, approximately 18% of the U.S. GNFs’ tools used cloud computing. Less than 7% of the U.S. GNFs’ tools used blockchain technology, artificial intelligence, or robotic process automation. All the U.S. GNFs’ tools used company data and approximately 20% also used third-party data.

Compared to U.S. GNFs, the U.S. NAFs within the scope of the PCAOB staff’s review reported to the PCAOB using fewer tools. In the 2023 inspection year, on average, the U.S. NAFs reported using approximately six tools per firm. For a subset of these firms, the average number of tools increased from approximately two tools per firm to approximately five tools

⁵⁸ The U.S. GNFs are BDO USA P.C., Deloitte & Touche LLP, Ernst & Young LLP, Grant Thornton LLP, KPMG LLP, and PricewaterhouseCoopers LLP. U.S. NAF firms include registered firms that are not global network firms.

⁵⁹ For example, some firms identified Microsoft Power BI and IDEA as tools used for data visualization, summarization, tabulation, or modelling.

per firm between 2020 and 2023.⁶⁰ The U.S. NAFs used the tools to visualize, summarize, and model data. Some of the U.S. NAFs reviewed use third-party software as their data analysis tools and used company data (e.g., transactional and journal entry data) as inputs. One U.S. NAF firm developed an in-house tool to assist with determining the completeness and accuracy of journal entry data used for testing journal entries.

One commenter asserted that the PCAOB should have information on firms' use of technology-based tools, as well as firms' improper use of tools, through its oversight activities. Information obtained through PCAOB oversight activities regarding firms' use of technology-based tools is presented here, and information related to firms' improper use of tools is presented in Section II.D above. As described above, the nature and extent of the use of technology-based tools in an audit varies by firm and by individual audit engagement. The Board's rulemaking has been informed by all relevant information as described in this release.

2. Research on Auditors' Use of Technology-Assisted Analysis

Academic studies regarding the prevalence of technology-based tools used to analyze information in electronic form and the impacts of using such tools in audits are limited. However, several recent surveys provide insights regarding: (i) how auditors have been incorporating data analytics into their audit approaches; and (ii) potential impediments to auditors' further implementation of data analytics. One commenter referenced additional academic research that was not originally cited in the proposing release. We considered this research and included references to articles that are relevant to the analysis in this release.⁶¹

Regarding incorporating data analytics into audit approaches, the surveys indicate that while the use of data analytics presently may not be widespread, it is becoming more common

⁶⁰ Due to changes in the data collection process and changes in firms' status as annually inspected, data is not available for all firms in all years. The overall 2023 estimate is based on data from seven U.S. NAFs, and the 2020-2023 trend data is based on data from five U.S. NAFs.

⁶¹ Several of the referenced papers report the results of experiments examining the behavioral factors associated with auditors' use of data analytics. These papers consider nuances of auditor behavior in specific circumstances that may not be generalizable to other settings because the results are based on hypothetical, self-reported choices rather than real-world audit settings. However, their results may be useful for auditors to consider in their use and implementation of technology-assisted analysis. See Tongrui Cao, Rong-Ruey Duh, Hun-Tong Tan, and Tu Xu, *Enhancing Auditors' Reliance on Data Analytics Under Inspection Risk Using Fixed and Growth Mindsets*, 97 *The Accounting Review* 131 (2022). See also Jared Koreff, *Are Auditors' Reliance on Conclusions from Data Analytics Impacted by Different Data Analytic Inputs?*, 36 *Journal of Information Systems* 19 (2022). See also Dereck Barr-Pulliam, Joseph Brazel, Jennifer McCallen, and Kimberly Walker, *Data Analytics and Skeptical Actions: The Countervailing Effects of False Positives and Consistent Rewards for Skepticism*, available at SSRN 3537180 (2023). See also Dereck Barr-Pulliam, Helen L. Brown-Liburd, and Kerri-Ann Sanderson, *The Effects of the Internal Control Opinion and Use of Audit Data Analytics on Perceptions of Audit Quality, Assurance, and Auditor Negligence*, 41 *Auditing: A Journal of Practice & Theory* 25 (2022).

in various aspects of the audit, primarily risk assessment and, to a lesser extent, substantive procedures. For example, a 2017 survey of U.S. auditors reported that auditors used data analytics in risk assessment and journal entry testing.⁶² Also, a survey of Norwegian auditors, some of whom perform audits under PCAOB standards, reported that data analytics were not widely used and were used primarily as supplementary evidence. In this survey, the respondents indicated that data analytics were used primarily in risk assessment and various types of substantive procedures, including analytical procedures.⁶³ A 2018 to 2019 survey of auditors in certain larger New Zealand firms reported that auditors are more frequently encountering accessible, large company data sets (i.e., data sets from the companies under audit). The respondents reported that third-party tools to process the data are increasingly available and allow auditors with less expertise in data analytics to make effective use of data.⁶⁴ A 2020 Australian study that focused on big data analytics found that the use of big data analytics has reduced auditor time spent on manual-intensive tasks and increased time available for tasks requiring critical thinking and key judgments.⁶⁵ A 2023 Canadian study that also focused on big data analytics found that big data analytics improves financial reporting quality.⁶⁶

Earlier surveys reported qualitatively similar, though less prevalent, use of data analytics. For example, a 2016 survey of Canadian firms reported that 63% and 39% of respondents from large firms and small to mid-sized firms, respectively, had used data

⁶² See Ashley A. Austin, Tina D. Carpenter, Margaret H. Christ, and Christy S. Nielson, *The Data Analytics Journey: Interactions Among Auditors, Managers, Regulation, and Technology*, 38 *Contemporary Accounting Research* 1888 (2021). The survey also states:

[A]uditors report that they strategically leverage data analytics to provide clients with business-related insights. However, regulators voice concerns that this practice might impair auditor independence and reduce audit quality.

The final amendments are not intended to suggest that when using technology-assisted analysis in an audit, auditors do not need to comply with PCAOB independence standards and rules, and the independence rules of the SEC. Auditors are still expected to comply with these standards and rules when using technology-assisted analysis on an audit engagement.

⁶³ See Aasmund Eilifsen, Finn Kinserdal, William F. Messier, Jr., and Thomas E. McKee, *An Exploratory Study into the Use of Audit Data Analytics on Audit Engagements*, 34 *Accounting Horizons* 75 (2020). The survey appears to have been performed around 2017 - 2018.

⁶⁴ See Angela Liew, Peter Boxall, and Denny Setiawan, *The Transformation to Data Analytics in Big-Four Financial Audit: What, Why and How?*, 34 *Pacific Accounting Review* 569 (2022).

⁶⁵ See Michael Kend and Lan Anh Nguyen, *Big Data Analytics and Other Emerging Technologies: The Impact on the Australian Audit and Assurance Profession*, 30 *Australian Accounting Review* 269 (2020).

⁶⁶ See Isam Saleh, Yahya Marei, Maha Ayoush, and Malik Muneer Abu Afifa, *Big Data Analytics and Financial Reporting Quality: Qualitative Evidence from Canada*, 21 *Journal of Financial Reporting and Accounting* 83 (2023).

analytics, most commonly in the risk assessment and substantive procedures phases. Both groups reported that data analytics were used to provide corroborative evidence for assertions about classes of transactions for the period under audit. However, only smaller and mid-sized firms reported that data analytics were also used to provide primary evidence for assertions about classes of transactions for the period under audit and account balances at period end. Furthermore, only larger firms reported that data analytics were also used to provide corroborative evidence for assertions about account balances at period end.⁶⁷

A survey of 2015 year-end audits performed by U.K. firms reported that the use of data analytics was not as prevalent as the market might expect, with the most common application being journal entry testing.⁶⁸ A 2015 survey of U.K. and EU auditors found that data analytics were being used in both risk assessment procedures and to perform certain specific audit procedures (e.g., recalculation).⁶⁹ Finally, a 2014 survey of U.S. auditors reported that they often use information technology to perform risk assessment, analytical procedures, sampling, internal control evaluations, and internal control documentation. The respondents identified moderate use of data analytics in the context of client administrative or practice management.⁷⁰

Regarding potential impediments to the implementation of data analytics, surveys indicate that some firms are reluctant to implement data analytics in their audit approach due to perceived regulatory risks. For example, one survey found that auditors were cautious about implementing data analytics due to a lack of explicit regulation. Respondents reported performing both tests of details that do not involve data analytics and those that do involve data analytics in audits under PCAOB standards.⁷¹ Another survey found that auditors did not require the use of advanced data analytic tools partly due to uncertainty regarding how regulatory authorities would perceive the quality of the audit evidence produced. However, the

⁶⁷ See CPA Canada, *Audit Data Analytics Alert: Survey on Use of Audit Data Analytics in Canada* (Sept. 2017) at 7, Exhibit 4 and 10, Exhibit 7.

⁶⁸ See Financial Reporting Council, *Audit Quality Thematic Review: The Use of Data Analytics in the Audit of Financial Statements* (Jan. 30, 2017) at 11.

⁶⁹ See George Salijeni, Anna Samsonova-Taddei, and Stuart Turley, *Big Data and Changes in Audit Technology: Contemplating a Research Agenda*, 49 *Accounting and Business Research* 95 (2019).

⁷⁰ See D. Jordan Lowe, James L. Bierstaker, Diane J. Janvrin, and J. Gregory Jenkins, *Information Technology in an Audit Context: Have the Big 4 Lost Their Advantage?*, 32 *Journal of Information Systems* 87 (2018). The authors do not define the term “data analytics,” and they present it as an application of information technology in the audit distinct from other audit planning and audit testing applications. However, we believe it is likely that some of the applications of information technology reported in the study would be impacted by the amendments and hence provide relevant baseline information.

⁷¹ See Austin et al., *The Data Analytics Journey 1910*. For similar findings, see also Liew et al., *The Transformation* 579-580.

respondents tended to agree that both standard setters and the auditing standards themselves allow information obtained from data analytics to be used as audit evidence.⁷² A different survey found that some auditors were reluctant to implement data analytics because the auditing standards do not specifically address them.⁷³ These survey findings are consistent with other surveys that find auditors structure their audit approaches to manage regulatory risks arising from inspections, including risks associated with compliance with PCAOB standards.⁷⁴ One commenter on the proposed amendments cited a study which noted that “uncertainty about regulators’ response and acceptance of emerging technologies can hinder its [emerging technology’s] adoption.”⁷⁵ However, by contrast, another survey found that the audit regulatory environment was not commonly cited by respondents as an impediment to the use of data analytics.⁷⁶

Overall, the research suggests that auditors’ use of technology-assisted analysis in designing and performing audit procedures is becoming increasingly prevalent. Some commenters also acknowledged that the use of technology-assisted analysis is becoming more prevalent. An investor-related group provided examples of expanded use of technology by both companies and audit firms, including the use of large, searchable databases and the development of tools for analyzing large volumes of data. This provides a baseline for considering the potential impacts of the final amendments. The research also suggests that some auditors perceive regulatory risks when implementing data analytics. Some commenters acknowledged that regulatory uncertainty has been a factor in firms’ hesitance to use technology-assisted analysis. This provides evidence of a potential problem that standard setting may address.

⁷² See Eilifsen et al., *An Exploratory Study*. For similar findings, see also Felix Krieger, Paul Drews, and Patrick Velte, *Explaining the (Non-) Adoption of Advanced Data Analytics in Auditing: A Process Theory*, 41 *International Journal of Accounting Information Systems* 1 (2021).

⁷³ See Salijeni et al., *Big Data* 110.

⁷⁴ See Kimberly D. Westermann, Jeffrey Cohen, and Greg Trompeter, *PCAOB Inspections: Public Accounting Firms on “Trial,”* 36 *Contemporary Accounting Research* 694 (2019). See also Lindsay M. Johnson, Marsha B. Keune, and Jennifer Winchel, *U.S. Auditors’ Perceptions of the PCAOB Inspection Process: A Behavioral Examination*, 36 *Contemporary Accounting Research* 1540 (2019).

⁷⁵ See Dereck Barr-Pulliam, Helen L. Brown-Liburud, and Ivy Munoko, *The Effects of Person-Specific, Task, and Environmental Factors on Digital Transformation and Innovation in Auditing: A Review of the Literature*, 33 *Journal of International Financial Management & Accounting* 337 (2022). This literature review focuses on emerging technologies broadly. Accordingly, much of the research it discusses is not directly relevant to the baseline for these amendments. However, several of the studies it cites are relevant and have already been discussed in this subsection, for example, Austin et al., *The Data Analytics Journey*.

⁷⁶ See CPA Canada, *Audit Data Analytics*, at Exhibit 10.

B. Need

Low-quality audits can occur for a number of reasons, including the following two reasons. First, the company under audit, investors, and other financial statement users cannot easily observe the procedures performed by the auditor, and thus the quality of the audit. This leads to a risk that, unbeknownst to the company under audit, investors, or other financial statement users, the auditor may perform a low-quality audit.⁷⁷

Second, the federal securities laws require that an issuer retain an auditor for the purpose of preparing or issuing an audit report. While the appointment, compensation, and oversight of the work of the registered public accounting firm conducting the audit is, under the Sarbanes-Oxley Act of 2002, as amended (“Sarbanes-Oxley”), entrusted to the issuer’s audit committee,⁷⁸ there is nonetheless a risk that the auditor may seek to satisfy the interests of the company under audit rather than the interests of investors and other financial statement users.⁷⁹ This risk could arise, for example, through audit committee identification with the company or its management (e.g., for compensation) or through management influence over the audit committee’s supervision of the auditor, resulting in a *de facto* principal-agent relationship between the company and the auditor.⁸⁰ Effective auditing standards help address

⁷⁷ See, e.g., Monika Causholli and W. Robert Knechel, *An Examination of the Credence Attributes of an Audit*, 26 *Accounting Horizons* 631, 632 (2012):

During the audit process, the auditor is responsible for making decisions concerning risk assessment, total effort, labor allocation, and the timing and extent of audit procedures that will be implemented to reduce the residual risk of material misstatements. As a non-expert, the auditee may not be able to judge the appropriateness of such decisions. Moreover, the auditee may not be able to ascertain the extent to which the risk of material misstatement has been reduced even after the audit is completed. Thus, information asymmetry exists between the auditee and the auditor, the benefit of which accrues to the auditor. If such is the case, the auditor may have incentives to: under-audit, or expend less audit effort than is required to reduce the uncertainty about misstatements in the auditee’s financial statements to the level that is appropriate for the auditee.

⁷⁸ See Section 301 of Sarbanes-Oxley, 15 U.S.C § 78f(m) (also requiring that the firm “report directly to the audit committee”). As an additional safeguard, the auditor is also required to be independent of the audit client. See 17 CFR 210.2-01.

⁷⁹ See, e.g., Joshua Ronen, *Corporate Audits and How to Fix Them*, 24 *Journal of Economic Perspectives* 189 (2010).

⁸⁰ See *id.*; see also, e.g., Liesbeth Bruynseels and Eddy Cardinaels, *The Audit Committee: Management Watchdog or Personal Friend of the CEO?*, 89 *The Accounting Review* 113 (2014); Cory A. Cassell, Linda A. Myers, Roy Schmardebeck, and Jian Zhou, *The Monitoring Effectiveness of Co-Opted Audit Committees*, 35 *Contemporary Accounting Research* 1732 (2018); Nathan R. Berglund, Michelle Draeger, and Mikhail Sterin, *Management’s Undue Influence over Audit Committee Members: Evidence from Auditor Reporting and Opinion Shopping*, 41 *Auditing: A Journal of Practice & Theory* 49 (2022).

these risks by explicitly assigning responsibilities to the auditor that, if executed properly, are expected to result in high-quality audits that satisfy the interests of audited companies, investors, and other financial statement users.

Economic theory suggests that technology is integral to the auditor's production function—i.e., the quantities of capital and labor needed to produce a given level of audit quality. As technology evolves, so do the quantities of capital and labor needed to produce a given level of audit quality.⁸¹ Auditing standards that do not appropriately accommodate the evolution of technology may therefore inadvertently deter or insufficiently facilitate improvements to the audit approach. Risk-averse auditors may be especially cautious about incorporating significant new technological developments into their audit approaches because they may be either unfamiliar with the technology or unsure whether a new audit approach would comply with the PCAOB's auditing standards. On the other hand, auditing standards that are too accommodative (e.g., by not adequately addressing the reliability of information used in a technology-based analysis) may not sufficiently address potential risks to audit quality arising from new audit approaches.

As described above, since 2010, when the PCAOB released a suite of auditing standards related to the auditor's assessment of and response to risk, two key technological developments have occurred. First, ERP systems that structure and house large volumes of information in electronic form have become more prevalent among companies. For example, one study reports that the global ERP market size increased by 60% between 2006 and 2012.⁸² As a result, auditors have greater access to large volumes of company-produced and third-party information in electronic form that may potentially serve as audit evidence. Second, the use of more sophisticated data analysis tools has become more prevalent among auditors.⁸³ As noted above, the PCAOB staff's analysis of the tools that firms use in technology-assisted analysis indicated that the number of such tools used by U.S. GNFs in audits increased by 38% between

⁸¹ See Gregory N. Mankiw, *Principles of Economics* (6th ed. 2008) at 76 (discussing how technology shifts the supply curve).

⁸² See Adelin Trusculescu, Anca Draghici, and Claudiu Tiberiu Albuiescu, *Key Metrics and Key Drivers in the Valuation of Public Enterprise Resource Planning Companies*, 64 *Procedia Computer Science* 917 (2015).

⁸³ This may be caused in part by a decrease in the quality-adjusted cost of software (i.e., the cost of software holding quality fixed). For example, see U.S. Bureau of Economic Analysis, "Table 5.6.4. Price Indexes for Private Fixed Investment in Intellectual Property Products by Type" available at https://apps.bea.gov/iTable/?reqid=19&step=3&isuri=1&nipa_table_list=330&categories=survey&gl=1*k50itr*ga*MTMyMjk5NTAzMS4xNzA5ODQ0OTEx*ga_J4698JNNFT*MTcwOTg0NDkxMS4xLjAuMTcwOTg0NDkxMS42MC4wLjA (accessed June 3, 2024) (indicating that the price index for capital formation in software by the business sector has decreased by approximately 12% between 2010 and 2022). In preparing its price indices, the U.S. Bureau of Economic Analysis attempts to control for changes in product quality over time. Improvements to product quality may have contributed to some increase in the cost of software, including some of the software that can process large volumes of data.

2018 and 2023.⁸⁴ One commenter noted that the advancement of analytical tools has increased auditor capabilities in data preparation and data validation.

These recent technological developments have been changing the way technology-assisted analysis is used in audits, as discussed in more detail in Section IV.A above. Although PCAOB standards related to the auditor's assessment of and response to risk generally were designed to apply to audits that use information technology, they may be less effective in providing direction to auditors if the standards do not address certain advancements in the use of technology-assisted analysis in audits. Modifying existing PCAOB standards through the final amendments addresses this risk, as discussed below. Many commenters, including an investor-related group, indicated there was a need for such standard setting given that the use of information in electronic form and the use of technology-based tools by companies and their auditors to analyze such information have expanded significantly since these standards were developed.

The remainder of this section discusses the specific problem that the final amendments are intended to address and how the amendments address it.

1. Problem to be Addressed

Audit procedures that involve technology-assisted analysis may be an effective way to obtain persuasive audit evidence. Although our research showed that auditors are using technology-assisted analysis to obtain audit evidence, it also indicated that existing PCAOB standards could address more specifically certain aspects of designing and performing audit procedures that involve technology-assisted analysis. As discussed in detail in Section III above, these aspects include specifying auditors' responsibilities when performing tests of details, using an audit procedure for more than one purpose, investigating certain items identified by the auditor when performing a test of details, and evaluating the reliability of information the company receives from one or more external sources that is provided to the auditor in electronic form and used as audit evidence.

Consequently, under existing standards, there is a risk that when using technology-based tools to design and perform audit procedures that involve technology-assisted analysis, an auditor may issue an auditor's report without having obtained sufficient appropriate audit evidence to provide a reasonable basis for the opinion expressed in the report. For example, if an auditor does not appropriately investigate certain items identified through technology-assisted analysis when performing a test of details, the auditor may not identify a misstatement that would need to be evaluated under PCAOB standards. In another example, if an auditor does not appropriately evaluate the level of disaggregation of certain information

⁸⁴ See Section IV.A above. See also Lowe et al., *Information Technology* 95 (reporting an increase in the use of information technology in audits between 2004 and 2014).

maintained by the company, the auditor would not be able to determine, under PCAOB standards, whether the evidence obtained is relevant to the assertion being tested.⁸⁵

Furthermore, there is a risk that auditors may choose not to involve technology-assisted analysis in the audit procedures they perform, even if performing such procedures would be a more effective, and may also be a more efficient, way of obtaining audit evidence. For example, an auditor may choose not to perform a substantive procedure that involves technology-assisted analysis if the auditor cannot determine whether the procedure would be considered a test of details under existing standards.

2. How the Final Amendments Address the Need

The final amendments address the risk that the auditor may not obtain sufficient appropriate audit evidence when addressing one or more financial statement assertions. For example, the final amendments: (i) specify considerations for the auditor when items are identified for further investigation as part of performing a test of details;⁸⁶ (ii) specify procedures the auditor should perform to evaluate the reliability of information the company receives from one or more external sources and that is provided to the auditor in electronic form and used as audit evidence;⁸⁷ and (iii) clarify that if the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure.⁸⁸

The final amendments also address the risk that auditors may choose not to perform audit procedures involving technology-assisted analysis by: (i) specifying responsibilities when performing tests of details;⁸⁹ and (ii) clarifying that an audit procedure may be used for more than one purpose.⁹⁰ Collectively, the amendments should lead auditors to perceive less risk of noncompliance with PCAOB standards when using technology-assisted analysis.

C. Economic Impacts

This section discusses the expected benefits and costs of the final amendments and potential unintended consequences. In the proposing release, we noted that we expect the economic impact of the amendments, including both benefits and costs, to be relatively

⁸⁵ See, e.g., Helen Brown-Liburd, Hussein Issa, and Danielle Lombardi, *Behavioral Implications of Big Data's Impact on Audit Judgment and Decision Making and Future Research Directions*, 29 *Accounting Horizons* 451 (2015) (discussing how irrelevant information may limit the value of data analysis). See also Financial Reporting Council, *Audit Quality*.

⁸⁶ See detailed discussion in Section III.A.2 above.

⁸⁷ See detailed discussion in Section III.C.1 above.

⁸⁸ See detailed discussion in Section III.B above.

⁸⁹ See detailed discussion in Section III.A above.

⁹⁰ See detailed discussion in Section III.B above.

modest. Some commenters disagreed with the characterization of costs and benefits as “modest,” stating that both costs and benefits of technology-assisted analysis can be substantial. However, we are not attempting to describe the overall costs and benefits of the use of technology-assisted analysis, but rather the marginal impact of the final amendments. It is difficult to quantify the benefits and costs because the final amendments do not require the adoption of any specific tools for technology-assisted analysis or that the auditor perform technology-assisted analysis. Some firms may choose to increase their investments in technology, and others may choose to make minimal changes to their existing audit practices. In general, we expect that firms will incur costs to implement or expand the use of technology-assisted analysis if firms determine that the benefits of doing so justify the costs. We have included qualitative references to the benefits and costs associated with the use of technology-assisted analysis, including those raised by commenters.

1. Benefits

The final amendments may lead auditors to design and perform audit procedures more effectively because they clarify and strengthen requirements of AS 1105 and AS 2301 related to aspects of designing and performing audit procedures that involve technology-assisted analysis. More effective audit procedures may lead to higher audit quality, more efficient audits, lower audit fees, or some combination of the three. To the extent the amendments lead to higher audit quality, they should benefit investors and other financial statement users by reducing the likelihood that the financial statements are materially misstated, whether due to error or fraud.

An increase in audit quality should in turn benefit investors as they may be able to use the more reliable financial information to improve the efficiency of their capital allocation decisions (e.g., investors may more accurately identify companies with the strongest prospects for generating future risk-adjusted returns and allocate their capital accordingly). Some commenters stated that the proposed amendments would benefit investors and the general public by reducing audit failures. One commenter stated that the analysis in the proposing release appeared to suggest that existing financial information and audits are “less reliable.” The Board’s intent was not to suggest that existing audits are unreliable, but rather that the proposed amendments may increase audit quality, which should in turn increase investors’ confidence in the information contained in financial statements. In theory, if investors perceive less risk in capital markets generally, their willingness to invest in capital markets may increase, and thus the supply of capital may increase. An increase in the supply of capital could increase capital formation while also reducing the cost of capital to companies.⁹¹ We are unable to quantify in precise terms this potential benefit, which would depend both on how audit firms respond to the standard and on how their response affects audit quality, factors that are likely

⁹¹ See, e.g., Hanwen Chen, Jeff Zeyun Chen, Gerald J. Lobo, and Yanyan Wang, *Effects of Audit Quality on Earnings Management and Cost of Equity Capital: Evidence from China*, 28 *Contemporary Accounting Research* 892 (2011); Richard Lambert, Christian Leuz, and Robert E. Verrecchia, *Accounting Information, Disclosure, and the Cost of Capital*, 45 *Journal of Accounting Research* 385 (2007).

to vary across audit firms and across engagements. Auditors also are expected to benefit from the final amendments because the additional clarity provided by the amendments should reduce regulatory uncertainty and the associated compliance costs. Specifically, the final amendments should provide auditors with a better understanding of their responsibilities, which in turn should reduce the risk that auditors design and perform potentially unnecessary audit procedures (e.g., potentially duplicative audit procedures).

Most commenters agreed that the proposed amendments would allow auditors to design and perform audit procedures more effectively, ultimately leading to higher quality audits. Some commenters identified specific benefits to audit quality resulting from increased use of technology-assisted analysis, such as the ability to automate some repetitive tasks and to improve the performance of risk assessment procedures and fraud and planning procedures. One commenter stated that the proposed amendments could result in the ineffective use of analytics if there is implicit pressure for firms to adopt technology-assisted analysis without appropriately preparing for its use, and another stated that the proposed amendments may not change the likelihood of not obtaining sufficient appropriate audit evidence. As discussed in Section IV.D.3.iii below, the final amendments are principles-based and are intended to clarify auditors' responsibilities when using technology-assisted analysis.

The following discussion describes the benefits of key aspects of the final amendments that are expected to impact auditor behavior. To the extent that a firm has already incorporated aspects of the amendments into its methodology, some of the benefits described below would be reduced.⁹²

i. Decreasing the Likelihood of Not Obtaining Sufficient Appropriate Audit Evidence

The final amendments are expected to enhance audit quality by decreasing the likelihood that an auditor who performs audit procedures using technology-assisted analysis will issue an auditor's report without obtaining sufficient appropriate audit evidence that provides a reasonable basis for the opinion expressed in the report. For example, the final amendments specify auditors' responsibilities for investigating items identified when performing a test of details. In another example, the final amendments specify auditors' responsibilities for evaluating the reliability of certain information provided by the company in electronic form and used as audit evidence. As a result, auditors may be more likely to obtain sufficient appropriate audit evidence when designing and performing audit procedures that use technology-assisted analysis, resulting in higher audit quality. As described above, the higher audit quality should benefit investors and other financial statement users by reducing the likelihood that the financial statements are materially misstated, whether due to error or fraud. These potential benefits to audit quality apply both to audit engagements where auditors currently incorporate technology-assisted analysis into their audit approach and audit

⁹² See discussion in Section II.C above.

engagements where auditors have been previously reluctant to use technology-assisted analysis because of the risk of noncompliance.

ii. Greater Use of Technology-Assisted Analysis

The final amendments may lead to some increase in the use of technology-assisted analysis by auditors when designing and performing multi-purpose audit procedures and tests of details. For example, the final amendments clarify the description of a “test of details.” As a result of this clarification, auditors may make greater use of technology-assisted analysis when designing or performing tests of details because they may perceive a reduction in noncompliance risk.

Notwithstanding the associated fixed and variable costs, greater use of technology-assisted analysis by the auditor when designing or performing audit procedures may allow the auditor to perform engagements with fewer resources, which may increase the overall resources available to perform audits.⁹³ In economic terms, it may increase the supply of audit quality.⁹⁴ For example, obtaining sufficient appropriate audit evidence by using technology-assisted analysis may require fewer staff hours than obtaining the evidence manually. Current labor shortages of qualified individuals and decreases in accounting graduates and new CPA examination candidates amplify the value of gathering sufficient appropriate audit evidence with fewer staff hours.⁹⁵

Apart from consideration of demands from the audited company, discussed in greater detail below, the efficiencies that may arise from greater utilization of technology-assisted analysis would be retained by the auditor in the form of higher profit. However, to better address regulatory, litigation, or reputational risks, the auditor may choose to redeploy engagement-level resources to other work. For example, auditors may shift staff resources to audit areas or issues that are more complex or require more professional judgment.⁹⁶

As a result of the greater use of technology-assisted analysis by auditors, some companies may be able to obtain a higher level of audit quality or renegotiate their audit fee, or

⁹³ See Section IV.C.2.ii below (discussing costs associated with greater use of technology-assisted analysis).

⁹⁴ For purposes of this discussion, “audit quality” refers to assurance on the financial statements provided by the auditor to the users of the financial statements. The “supply of audit quality” is the relationship between audit quality and incremental cost to the auditor. An “increase in the supply of audit quality” occurs when the incremental costs of audit quality decrease (e.g., due to technological advances) and the auditor is able to profitably provide more audit quality at a given cost.

⁹⁵ See, e.g., AICPA Private Companies Practice Section, *2022 PCPS CPA Top Issues Survey (2022)*; AICPA, *2021 Trends: A Report on Accounting Education, the CPA Exam and Public Accounting Firms’ Hiring of Recent Graduates (2021)*.

⁹⁶ See, e.g., Salijeni et al., *Big Data*.

both. The outcome would likely vary by company depending on the competitiveness of the company's local audit market and the company's audit quality expectations. For example, negotiating power may be smaller for larger multinational companies, which may have fewer auditor choices, than for smaller companies, which may have more auditor choices. Furthermore, some companies may expect their auditor to reassign engagement team staff resources from repetitive or less complex audit procedures to more judgmental aspects of the audit. Other companies may expect the engagement team to perform the audit with fewer firm resources (e.g., fewer billable hours). Some research suggests that most companies prefer audit fee reductions in response to their auditor's greater use of data analytics.⁹⁷

Because the final amendments do not require the auditor to use technology-assisted analysis when designing and performing audit procedures, the associated benefits would likely be limited to cases where auditors determine that their benefits justify their costs, including any fixed costs required to update the auditor's approach (e.g., update methodologies, provide training). The fixed costs may be significant; however, some firms may have incurred some of these costs already.⁹⁸ Moreover, despite the continued tendency of companies to adopt ERP systems to house their accounting and financial reporting data, some companies' data may remain prohibitively difficult to obtain and analyze, thus limiting the extent to which the auditor can use technology-assisted analysis.⁹⁹ Some survey research also suggests that some firms lack sufficient staff resources to appropriately deploy data analysis.¹⁰⁰ Collectively, these private costs may deter some auditors from incorporating technology-assisted analysis into their audit approach and thereby reduce the potential benefits associated with greater use of technology-assisted analysis.

Some commenters suggested that audit fees are unlikely to decrease as a result of increased use of technology-assisted analysis due primarily to the costs involved with using technology-assisted analysis. One commenter stated that our analysis in the proposal focused on reducing costs (which could put downward pressure on audit fees), and suggested that our analysis should focus instead on enabling auditors to shift resources to higher-risk areas of the audit, which should increase audit quality. Another commenter urged the PCAOB not to include commentary that relates the greater use of technology-assisted analysis to lower audit fees on the grounds that the proposing release underestimated the costs to smaller firms of designing, implementing, and operating technology-assisted analysis. The commenter added that such commentary could have the unintended effect of encouraging firms to reduce costs and

⁹⁷ See Austin et al., *The Data Analytics Journey*.

⁹⁸ See Section IV.A above (discussing increased availability of data analytic tools at larger firms and Austin et al., *The Data Analytics Journey* 1908).

⁹⁹ See, e.g., Austin et al., *The Data Analytics Journey* 1906.

¹⁰⁰ See, e.g., Saligeni et. al, *Big Data* 108. See also CPA Canada, *Audit Data Analytics*. However, some more recent survey research suggests that auditors tend to agree that they have the technical expertise to deploy data analytics. See Eilifsen et al., *An Exploratory Study* 84.

therefore choose to use analytics ineffectively or choose not to implement technology-assisted analysis. A different commenter noted that the “supposition that efficiencies would accrue to the firms, potentially impacting audit efficiencies or even audit fees, is beyond the Board’s charge of improving audit quality.” We acknowledge that there can be significant costs associated with the use of technology-assisted analysis, particularly with the initial implementation of technology-assisted analysis tools, which some firms may pass on to audited companies in the form of higher audit fees, at least in the short term. However, we note that the final amendments do not require the use of technology-assisted analysis, and academic studies suggest that greater use of data analytics could reduce audit fees.¹⁰¹

One commenter stated that the PCAOB should be “agnostic” about the use of audit technology and should focus on audit quality rather than audit efficiency. We believe that the PCAOB’s focus on audit quality does not preclude us from considering the effect of audit efficiency on our stakeholders. Furthermore, audit efficiencies in one area may allow auditors to redeploy resources to other audit areas that are more complex or require more professional judgment, resulting in increased audit quality.

2. Costs

To the extent that firms make changes to their existing audit approaches as a result of the final amendments, they may incur certain fixed costs (i.e., costs that are generally independent of the number of audits performed), including costs to: update audit methodologies, templates, and tools; prepare training materials; train their staff; and develop or purchase software. GNFs and some NAFs are likely to update their methodologies using internal resources, whereas other NAFs are likely to purchase updated methodologies from external vendors.

In addition, firms may incur certain engagement-level variable costs. For example, the final amendments related to evaluating whether certain information provided by the company in electronic form and used as audit evidence is reliable could require additional time and effort by engagement teams that use such information in performing audit procedures. This additional time, and therefore the resulting variable costs, may be less on integrated audits or financial-statement audits that take a controls reliance approach because, in these cases, internal controls over the information, including ITGCs and automated application controls, may already be tested. As another example, some firms may incur software license fees that vary by the number of users. To the extent that auditors incur higher costs to implement the amendments and can pass on at least part of the increased costs through an increase in audit fees, audited companies may also incur an indirect cost.

Some commenters stated that they do not believe the fixed and variable cost increases will be modest as stated in the proposal, and that the evolution of technology-assisted analysis

¹⁰¹ See Austin et al., *The Data Analytics Journey* 1891.

may render tools and training obsolete, requiring renewed investment at regular intervals. One of these commenters referenced increased resource costs such as the need to investigate items identified through technology-assisted analysis. One commenter stated that the proposing release mischaracterized the costs to NAFs of implementing technology-assisted analysis. This commenter noted that costs could include a learning curve for new technology adoption, increased costs of hiring engagement team members with appropriate skill sets, obtaining reliable data, and the development or purchase of software tools. Another stated that some audit firms already use technology, so both costs and benefits would be modest for those firms. As we discussed in the proposal and have reiterated above, the final amendments do not require the use of technology-assisted analysis. Therefore, the costs discussed by these commenters would occur only if firms determined it was in their best interest to incur them.

Some aspects of the final amendments may result in more or different costs than others. The following discussion describes the potential costs associated with specific aspects of the amendments.

i. Potential Additional Audit Procedures and Implementation Costs

The final amendments clarify and specify auditor responsibilities when designing and performing audit procedures that involve technology-assisted analysis. As a result, some auditors may perform incremental procedures to comply with the final amendments, which may lead to incremental costs. For example, in addition to applying technology-assisted analysis when testing specific items in the population, some auditors may address the items not selected for testing by performing other substantive procedures if the auditor determines that there is a reasonable possibility of a risk of material misstatement in the items not selected for testing (i.e., the remaining population). To the extent that auditors currently do not fulfill their responsibilities under existing PCAOB standards related to the remaining population when there is a reasonable possibility of a risk of material misstatement, those firms may incur one-time costs to update firm methodologies and ongoing costs related to fulfilling their responsibilities. In another example, an auditor may determine that incremental procedures are necessary to evaluate the reliability of external information provided by the company in electronic form. These incremental procedures may apply to audit engagements where auditors currently incorporate technology-assisted analysis into their audit approach, and audit engagements where auditors have been reluctant to use technology-assisted analysis due to the risk of noncompliance.

At the firm level, some firms may incur relatively modest fixed costs to update their methodologies and templates (e.g., documentation templates) or customize their technology-based tools. Firms may also need to prepare training materials and train their staff. Firms may incur relatively modest variable costs if they determine that additional time and effort on an individual audit engagement is necessary in order to comply with the final amendments. For example, a firm may incur additional variable costs to investigate items identified when performing a test of details.

ii. Greater Use of Technology-Assisted Analysis

As discussed above, the final amendments do not require the use of technology-assisted analysis in an audit. However as noted above, the final amendments may lead to some increase in the use of technology-assisted analysis by auditors when designing and performing multi-purpose audit procedures and tests of details. The greater use of technology-assisted analysis by the auditor may allow the auditor to perform engagements with fewer resources. However, this potential efficiency benefit would likely be offset, in part, by fixed and variable costs to the audit firm. Fixed costs may be incurred to incorporate technology-assisted analysis into the audit approach. For example, some firms may purchase, develop, or customize new tools.¹⁰² Some firms may choose to hire programmers to develop tools internally. Firms may also incur fixed costs to obtain an understanding of companies' information systems.¹⁰³ Some commenters stated that the costs to research, develop, and implement technology-assisted analysis can be significant. They also stated that rapid technological advancements require continual investment by audit firms to keep pace. Because the final amendments do not require the adoption of technology-assisted analysis, any such investments by firms would be made only if they determine that the benefits justify the costs.

Relatively modest variable costs may be incurred to use technology-assisted analysis on individual audit engagements. For example, firms may incur variable costs associated with preparing company data for analysis or updating their technology-based tools. Several commenters stated that there are costs associated with obtaining or preparing data in a format that can be utilized by specific tools for technology-assisted analysis. In another example, a firm may incur variable costs to obtain specialized expertise for using technology-assisted analysis on audit engagements. For example, a firm data analytics specialist may be used on an audit engagement to automate certain aspects of data preparation or design and perform a custom technology-assisted analysis. One commenter noted that the investigation of items identified by technology-assisted analysis requires resources such as the involvement of personnel who are skilled in interpreting the results of technology-assisted analysis. As a result, according to the commenter, the use of technology-assisted analysis may not necessarily reduce costs and may increase costs. As discussed in Section IV.C.1.ii above, auditors may increase audit fees due to costs associated with the use of technology-assisted analysis, passing along some of those costs to audited companies. Several factors may limit the costs associated with greater use of technology-assisted analysis in an audit. First, the costs would likely be incurred by a firm only if it determined that the private benefits to it would exceed the private costs. Second, some firms

¹⁰² See Financial Reporting Council, *Audit Quality*. See also Austin et al., *The Data Analytics Journey* 1908.

¹⁰³ See Eilifsen et al., *An Exploratory Study* 71 (discussing how audit data analytics are used less often when the company does not have an integrated ERP/IT system). See also Financial Reporting Council, *Audit Quality*.

have already made investments to incorporate technology-assisted analysis in audits. Finally, the cost of software that can process and analyze large volumes of data has been decreasing.¹⁰⁴

3. Potential Unintended Consequences

In addition to the benefits and costs discussed above, the final amendments could have unintended economic impacts. The following discussion describes potential unintended consequences considered by the Board and, where applicable, factors that mitigate them. These include actions taken by the Board as well as the existence of other countervailing forces.

i. Reduction in the Use of Technology-Assisted Analysis

It is possible that, as a result of the final amendments, some auditors could reduce their use of technology-assisted analysis. This could occur if the final amendments were to lead firms to conclude that the private benefits would not justify the private costs of involving technology-assisted analysis in their audit approach. For example, the final amendments specify considerations for investigating items identified by the auditor when performing a test of details and procedures for evaluating the reliability of certain information the company receives from one or more external sources and used as audit evidence. As discussed in Section IV.C.2 above, such additional responsibilities could lead to fixed costs at the firm level and variable costs at the engagement level. As a result, some auditors may choose not to use audit procedures that involve technology-assisted analysis.

Several factors would likely mitigate any negative effects associated with this potential unintended consequence. First, we believe that any decrease in the use of technology-assisted analysis would likely arise from a reduction in the performance of audit procedures that would not have contributed significantly to providing sufficient appropriate audit evidence. This development would therefore probably benefit, rather than detract from, audit quality. For example, currently some auditors might not appropriately investigate items identified when using technology-assisted analysis in performing tests of details. The final amendments specify auditors' responsibilities for investigating the items identified. If auditors view the requirement as too costly to implement, they may instead choose to perform audit procedures that do not involve the use of technology-assisted analysis. If the other procedures chosen by the auditor provide sufficient appropriate audit evidence, the reduction in the performance of audit procedures that involve technology-assisted analysis (where auditors did not appropriately investigate items identified) would benefit audit quality.

Second, any reduction in the use of technology-assisted analysis resulting from certain of the amendments, such as in the above scenario, may be offset by the greater use of technology-assisted analysis in other scenarios. For example, as discussed in Section IV.C.1 above, the final amendments clarify the description of a "test of details." As a result, auditors

¹⁰⁴

See Section IV.B above.

may make greater use of technology-assisted analysis in performing tests of details because they may perceive a reduction in noncompliance risk.

Finally, because the final amendments are principles-based, auditors will be able to tailor their work subject to the amendments to the facts and circumstances of the audit. For example, the amendments do not prescribe procedures for investigating items identified when performing a test of details. Rather, the auditor will be able to structure the investigation based on, among other things, the type of analysis and the assessed risks of material misstatement.¹⁰⁵

Some commenters stated that the proposed amendments could potentially deter auditors from using technology-assisted analysis; in contrast, others said that the proposed amendments could potentially pressure auditors to use technology-assisted analysis. As outlined above, the final amendments, consistent with the proposal, do not require the use of technology-assisted analysis, and we believe that auditors will use technology-assisted analysis to the extent that it allows them to perform audit procedures in a more efficient or effective manner. Some commenters expressed appreciation for PCAOB standards that allow auditors to employ appropriate audit procedures based on the facts and circumstances of the audit engagement. They agreed with the scalable, principles-based approach that allows for use of technology-assisted analysis to the extent that it is effective and efficient, taking into consideration the firm size, company size, and other circumstances of the audit engagement.

ii. Inappropriately Designed Multi-Purpose Audit Procedures

It is possible that some auditors could view the final amendments as allowing any audit procedure that involves technology-assisted analysis to be considered a multi-purpose procedure. Auditors who hold this view may fail to design and perform audit procedures that provide sufficient appropriate audit evidence. This potential unintended consequence would be mitigated by (i) existing requirements of PCAOB standards; and (ii) the amendment to paragraph .14 of AS 1105.

Existing PCAOB standards address auditors' responsibilities for designing and performing procedures to identify, assess, and respond to risks of material misstatement and obtaining sufficient appropriate audit evidence.¹⁰⁶ Auditor responsibilities established by existing PCAOB standards apply to the performance of both audit procedures that are designed to achieve a single objective and audit procedures that are designed to achieve multiple objectives. Further, existing standards specify auditor responsibilities in certain scenarios that involve multi-purpose audit procedures. For example, existing PCAOB standards provide that an audit procedure may serve as both a risk assessment procedure and a test of controls provided that

¹⁰⁵ See Section III.A.2 above.

¹⁰⁶ See, e.g., AS 2110 and AS 2301.

the auditor meets the objectives of both procedures.¹⁰⁷ In another example, existing PCAOB standards provide that audit procedures may serve as both a test of controls and a substantive procedure provided that the auditor meets the objectives of both procedures.¹⁰⁸

In addition, the amendment to paragraph .14 of AS 1105 would further mitigate the risk that auditors fail to design and perform multi-purpose audit procedures. The amendment would emphasize the auditor's responsibility to achieve particular objectives specified in existing PCAOB standards when using audit evidence from an audit procedure for multiple purposes.

iii. Disproportionate Impact on Smaller Firms

It is possible that the costs of the final amendments could disproportionately impact smaller firms. As discussed in Section IV.C.2 above, increased use of technology-assisted analysis may require incremental investment and specialized skills. Smaller firms have fewer audit engagements over which to distribute fixed costs (i.e., they lack economies of scale). As a result, smaller firms may be less likely than larger firms to increase their use of technology-assisted analysis when designing and performing multi-purpose audit procedures and tests of details. Although the final amendments do not require auditors to use technology-assisted analysis, a choice not to use it may negatively impact smaller firms' ability to compete with larger firms (e.g., if using technology-assisted analysis is expected by prospective users of the auditor's report). One commenter stated that the costs of using technology-assisted analysis could be significant and cause audits performed by small and mid-sized accounting firms to be uneconomical.

This potential unintended negative consequence would be mitigated by several factors. First, the fixed costs associated with the amendments may be offset by engagement-level efficiencies which may increase the competitiveness of smaller firms. Second, as discussed in Section IV.B above, the costs associated with acquiring and incorporating technology-based analytical tools into firms' audit approaches have been decreasing and may continue to decrease. Third, while reduced competition may result in higher audit fees,¹⁰⁹ it may also reduce companies' opportunity to opinion shop, thereby positively impacting audit quality.¹¹⁰

¹⁰⁷ See AS 2110.39.

¹⁰⁸ See AS 2301.47.

¹⁰⁹ See, e.g., Joshua L. Gunn, Brett S. Kawada, and Paul N. Michas, *Audit Market Concentration, Audit Fees, and Audit Quality: A Cross-Country Analysis of Complex Audit Clients*, 38 *Journal of Accounting and Public Policy* 1 (2019).

¹¹⁰ See, e.g., Nathan J. Newton, Julie S. Persellin, Dechun Wang, and Michael S. Wilkins, *Internal Control Opinion Shopping and Audit Market Competition*, 91 *The Accounting Review* 603 (2016); Nathan J. Newton, Dechun Wang, and Michael S. Wilkins, *Does a Lack of Choice Lead to Lower Quality?*

In contrast, some literature suggests that reduced competition may have a negative effect on audit quality.¹¹¹ Finally, any negative impact on the smaller firms' ability to compete with larger firms would likely be limited to smaller and mid-sized companies because smaller firms may lack the economies of scale and multi-national presence to compete for the audits of larger companies. Indeed, there is some evidence that smaller and larger audit firms do not directly compete with each other in some segments of the audit market¹¹² although some research suggests that smaller and larger firms do compete locally in some cases.¹¹³

D. Alternatives Considered

The development of the final amendments involved considering numerous alternative approaches to addressing the problems described above. This section explains: (i) why standard setting is preferable to other policy-making approaches, such as providing interpretive guidance or enhancing inspection or enforcement efforts; (ii) other standard-setting approaches that were considered; and (iii) key policy choices made by the Board in determining the details of the amendments.

1. Why Standard Setting is Preferable to Other Policy-Making Approaches

The Board's policy tools include alternatives to standard setting, such as issuing interpretive guidance or increasing the focus on inspections or enforcement of existing standards. We considered whether providing guidance or enhancing inspection or enforcement efforts would be effective mechanisms to address concerns associated with aspects of designing and performing audit procedures that involve technology-assisted analysis. One commenter stated that PCAOB staff guidance would be preferable to standard setting to communicate the requirements. Several commenters stated that additional guidance and examples would be helpful for auditors when applying existing standards and the proposed amendments when performing audit procedures that involve technology-assisted analysis.

Interpretive guidance inherently provides additional information about existing standards. Inspection and enforcement actions take place after insufficient audit performance (and potential investor harm) has occurred. Devoting additional resources to interpretive

Evidence from Auditor Competition and Client Restatements, 32 *Auditing: A Journal of Practice & Theory* 31 (2013).

¹¹¹ See, e.g., Jeff P. Boone, Inder K. Khurana, and K.K. Raman, *Audit Market Concentration and Auditor Tolerance for Earnings Management*, *Contemporary Accounting Research* 29 (2012); Nicholas J. Hallman, Antonis Kartapanis, and Jaime J. Schmidt, *How Do Auditors Respond to Competition? Evidence From the Bidding Process*, *Journal of Accounting and Economics* 73 (2022).

¹¹² See, e.g., GAO Report No. GAO-03-864, *Public Accounting Firms: Mandated Study on Consolidation and Competition* (July 2003).

¹¹³ See, e.g., Kenneth L. Bills and Nathaniel M. Stephens, *Spatial Competition at the Intersection of the Large and Small Audit Firm Markets*, 35 *Auditing: A Journal of Practice and Theory* 23 (2016).

guidance, inspections, or enforcement activities, without improving the relevant performance requirements for auditors, would at best focus auditors' performance on existing standards and would not provide the benefits associated with improving the standards, which are discussed in Section IV.C.1 above.

The final amendments, by contrast, are designed to improve PCAOB standards by adding further clarity and specificity to existing requirements. For example, the amendments specify auditor responsibilities for evaluating the reliability of external information provided by the company in electronic form and used as audit evidence. In another example, the amendments clarify auditor responsibilities when the auditor uses an audit procedure for more than one purpose.

2. Other Standard-Setting Approaches Considered

The Board considered, but decided against, developing a standalone standard that would address designing and performing audit procedures that involve technology-assisted analysis. Addressing the use of technology-assisted analysis in a standalone standard could further highlight the auditor's responsibilities relating to using technology-assisted analysis. However, a new standalone standard would also unnecessarily duplicate many of the existing requirements, because existing PCAOB standards are already designed to be applicable to audits performed with the use of technology, including technology-assisted analysis.

Further, as Section II above explains in greater detail, our research indicates that auditors are using technology-assisted analysis in audit procedures. Rather than developing a new standalone standard, the final amendments use a more targeted approach that includes amending certain requirements of the standards where our research has indicated the need for providing further clarity and specificity regarding designing and performing audit procedures that involve technology-assisted analysis.

3. Key Policy Choices

i. Investigating Certain Items Identified by the Auditor

As discussed in Sections II and III above, auditors may use technology-assisted analysis to identify items within a population (e.g., transactions in an account) for further investigation when performing a test of details.¹¹⁴ The auditor's investigation may include, for example, examining documentary evidence for items identified through the analysis, or designing and performing other audit procedures to determine whether the items identified individually or in the aggregate indicate misstatements or deficiencies in the company's internal control over financial reporting.

¹¹⁴ See detailed discussion in Section III.A.2 above.

We considered but are not prescribing specific audit procedures to investigate items identified by the auditor in the way described in the above examples. Instead, the final amendments specify that audit procedures that the auditor performs to investigate the identified items are part of the auditor's response to the risk of material misstatement. The auditor determines the nature, timing, and extent of such procedures in accordance with PCAOB standards. We also considered, but are not prescribing, specific audit procedures to address items not selected for a test of details (i.e., remaining items in the population) when the auditor's means of selecting items was selecting specific items. Although certain audit procedures may be effective to address the assessed risk under certain circumstances, other audit procedures may be more effective under different circumstances. Because of the wide range of both the analyses that the auditor may perform to identify items for further investigation, and the potentially appropriate audit procedures that the auditor may perform to investigate them, we believe that an overly prescriptive standard could in certain cases lead auditors to perform audit procedures without considering the facts and circumstances of the audit engagement.

ii. Describing a New Specific Audit Procedure

We considered but are not describing (or defining), technology-assisted analysis or similar terms (e.g., data analysis or data analytics) in AS 1105 as a new specific audit procedure. Although describing technology-assisted analysis as a specific audit procedure might clarify certain auditor responsibilities, it could also create confusion and unnecessarily constrain the potential use of such analyses in the audit. As our research indicates, and as commenters have stated, auditors already incorporate technology-assisted analysis in various types of audit procedures (e.g., inspection, recalculation, reperformance, analytical procedures) that are used for various purposes (e.g., identifying risk or responding to risk). In addition, describing technology-assisted analysis or similar terms would present challenges because the meaning of such terms may vary depending on the context and may further evolve as technology evolves.

iii. Requiring Auditors' Use of Technology

The final amendments, consistent with existing PCAOB standards, are principles-based and are intended to be applicable to all audits conducted under PCAOB standards. An investor-related group commented that the Board should consider requiring that auditors use certain types of technology-based tools that financial research and investment management firms have used to assess and verify the accuracy and completeness of financial statements, in order to improve audit quality and help detect fraud. In contrast, some commenters noted that requiring the use of certain technology could have unintended consequences for smaller companies and affect the ability of smaller firms to compete. As one commenter noted, clients of small and mid-sized accounting firms may rely on other processes appropriate to their size to manage their operations and financial reporting, and the use of technology-assisted analysis may not be as cost-effective in those circumstances. Another commenter noted that it is important that PCAOB standards continue to enable auditors to employ audit procedures that

are appropriate based on the engagement-specific facts and circumstances, recognizing that technology-assisted analysis may not be the most effective option and therefore its use should not be expected on all audits. That commenter emphasized the need for the proposed amendments to be scalable for firms (and the companies they audit) of all sizes and with varying technological resources. Several other commenters stated that the principles-based nature of the proposed amendments was important, so that they can be applicable to all PCAOB-registered firms and the audits they conduct under PCAOB standards, regardless of the size of the firm or complexity of the issuer.

We have considered the views of commenters, including those of investors, and we have decided not to require auditors' use of technology as part of these final amendments, which would be outside the scope of the project. Maintaining a principles-based approach to these amendments is appropriate due to the ever-evolving nature of technology; requiring the use of specific types of technology, based on how they are used today, could quickly become outdated. In addition, as discussed in Section II.D above, the Board's Technology Innovation Alliance Working Group continues to advise the Board on the use of emerging technologies by auditors and preparers relevant to audits and their potential impact on audit quality. These ongoing activities may inform future standard-setting projects.

V. SPECIAL CONSIDERATIONS FOR AUDITS OF EMERGING GROWTH COMPANIES

Pursuant to Section 104 of the Jumpstart Our Business Startups ("JOBS") Act, rules adopted by the Board subsequent to April 5, 2012, generally do not apply to the audits of emerging growth companies ("EGCs"), as defined in Section 3(a)(80) of the Securities Exchange Act of 1934 ("Exchange Act"), unless the SEC "determines that the application of such additional requirements is necessary or appropriate in the public interest, after considering the protection of investors, and whether the action will promote efficiency, competition, and capital formation."¹¹⁵ As a result of the JOBS Act, the rules and related amendments to PCAOB standards that the Board adopts are generally subject to a separate determination by the SEC regarding their applicability to audits of EGCs.

To inform consideration of the application of auditing standards to audits of EGCs, the PCAOB staff prepares a white paper annually that provides general information about

¹¹⁵ See Pub. L. No. 112-106 (Apr. 5, 2012). See also Section 103(a)(3)(C) of Sarbanes-Oxley, as added by Section 104 of the JOBS Act (providing that any rules of the Board requiring: (1) mandatory audit firm rotation; or (2) a supplement to the auditor's report in which the auditor would be required to provide additional information about the audit and the financial statements of the issuer (auditor discussion and analysis), shall not apply to an audit of an EGC. The amendments do not fall within either of these two categories).

characteristics of EGCs.¹¹⁶ As of the November 15, 2022, measurement date in the February 2024 EGC White Paper, PCAOB staff identified 3,031 companies that self-identified with the SEC as EGCs and filed with the SEC audited financial statements in the 18 months preceding the measurement date.¹¹⁷

As discussed in Section II above, auditors are expanding the use of technology-assisted analysis in audits. The final amendments, as discussed above in Section III, address aspects of designing and performing audit procedures that involve technology-assisted analysis. The amendments are principles-based and are intended to be applied in all audits performed pursuant to PCAOB standards, including audits of EGCs.

The discussion of benefits, costs, and unintended consequences of the final amendments in Section IV above is generally applicable to all audits performed pursuant to PCAOB standards, including audits of EGCs. The economic impacts of the amendments on an individual EGC audit would depend on factors such as the auditor's ability to distribute implementation costs across its audit engagements, whether the auditor has already incorporated technology-assisted analysis into its audit approach, and electronic information acquisition challenges (e.g., information availability, legal restrictions, or privacy concerns). EGCs are more likely to be newer companies, which are typically smaller in size and receive lower analyst coverage. These factors may increase the importance to investors of the higher audit quality resulting from the amendments, as high-quality audits generally enhance the credibility of management disclosures.¹¹⁸

¹¹⁶ See PCAOB, *White Paper on Characteristics of Emerging Growth Companies and Their Audit Firms at November 15, 2022* (Feb. 20, 2024) ("EGC White Paper"), available at <https://pcaobus.org/resources/other-research-projects>.

¹¹⁷ The EGC White Paper uses a lagging 18-month window to identify companies as EGCs. Please refer to the "Current Methodology" section in the white paper for details. Using an 18-month window enables staff to analyze the characteristics of a fuller population in the EGC White Paper but may tend to result in a larger number of EGCs being included for purposes of the present EGC analysis than would alternative methodologies. For example, an estimate using a lagging 12-month window would exclude some EGCs that are delinquent in making periodic filings. An estimate as of the measurement date would exclude EGCs that have terminated their registration, or that have exceeded the eligibility or time limits. See *id.*

¹¹⁸ Researchers have developed a number of proxies that are thought to be correlated with information asymmetry, including small company size, lower analyst coverage, larger insider holdings, and higher research and development costs. To the extent that EGCs exhibit one or more of these properties, there may be a greater degree of information asymmetry for EGCs than for the broader population of companies, which increases the importance to investors of the external audit to enhance the credibility of management disclosures. See, e.g., Steven A. Dennis and Ian G. Sharpe, *Firm Size Dependence in the Determinants of Bank Term Loan Maturity*, 32 *Journal of Business Finance & Accounting* 31 (2005); Michael J. Brennan and Avaniidhar Subrahmanyam, *Investment Analysis and Price*

However, as discussed in Section IV.A above, the use of technology-assisted analysis appears to be less prevalent among NAFs than GNFs. Therefore, since EGCs are more likely than non-EGCs to be audited by NAFs, the impacts of the amendments on EGC audits may be less than on non-EGC audits.¹¹⁹

The final amendments could impact competition in an EGC's product market if the indirect costs to audited companies disproportionately impact EGCs relative to their competitors. However, as discussed in Section IV.C above, the costs associated with the amendments are expected to be relatively modest. Therefore, the impact of the amendments on competition, if any, is likewise expected to be limited.

Overall, the final amendments are expected to enhance the efficiency and quality of EGC audits that implement technology-assisted analysis and contribute to an increase in the credibility of financial reporting by those EGCs. To the extent the amendments improve EGCs' financial reporting quality, they may also improve the efficiency of capital allocation, lower the cost of capital, and enhance capital formation. For example, higher financial reporting quality may allow investors to more accurately identify companies with the strongest prospects for generating future risk-adjusted returns and reallocate their capital accordingly. Investors may also perceive less risk in EGC capital markets generally, leading to an increase in the supply of capital to EGCs. This may increase capital formation and reduce the cost of capital to EGCs. We are unable to quantify in precise terms this potential benefit, which would depend both on how audit firms respond to the standard and on how their response affects audit quality, factors that are likely to vary across audit firms and across engagements.

Furthermore, if certain of the amendments did not apply to the audits of EGCs, auditors would need to address differing audit requirements in their methodologies, or policies and procedures, with respect to audits of EGCs and non-EGCs. This could create the potential for additional confusion.

Two commenters on the proposal specifically supported the application of the amendments to EGCs. One of those commenters stated that excluding EGCs from the proposal would be inconsistent with protecting the public interest.

Formation in Securities Markets, 38 *Journal of Financial Economics* 361 (1995); David Aboody and Baruch Lev, *Information Asymmetry, R&D, and Insider Gains*, 55 *The Journal of Finance* 2747 (2000); Raymond Chiang and P. C. Venkatesh, *Insider Holdings and Perceptions of Information Asymmetry: A Note*, 43 *The Journal of Finance* 1041 (1988); Molly Mercer, *How Do Investors Assess the Credibility of Management Disclosures?*, 18 *Accounting Horizons* 185 (2004).

¹¹⁹ Staff analysis indicates that, compared to exchange-listed non-EGCs, exchange-listed EGCs are approximately 2.6 times as likely to be audited by an NAF and approximately 1.3 times as likely to be audited by a triennially inspected firm. Source: EGC White Paper and Standard & Poors.

Accordingly, and for the reasons explained above, the Board will request that the Commission determine that it is necessary or appropriate in the public interest, after considering the protection of investors and whether the action will promote efficiency, competition, and capital formation, to apply the final amendments to audits of EGCs.

VI. EFFECTIVE DATE

The Board determined that the amendments will take effect, subject to approval by the SEC, for audits of financial statements for fiscal years beginning on or after December 15, 2025.

In the proposing release, the Board sought comment on the amount of time auditors would need before the amendments become effective, if adopted by the Board and approved by the SEC. We proposed an effective date for audits with fiscal years ending on or after June 30 in the year after approval by the SEC.

Several, mostly larger firms and firm-related groups, supported an effective date of audits of financial statements for fiscal years beginning on or after December 15 at least one year following SEC approval, or for fiscal years ending on or after December 15 at least two years following SEC approval. Two commenters supported an effective date two years after SEC approval. These commenters indicated that this would give firms the necessary time to update firm methodologies, tools, and develop and implement training. In addition, several commenters highlighted that additional time would be needed because of the potential indirect impact on companies, especially if companies need to implement or formalize controls or processes around information received from one or more external sources, and auditors need to verify that the controls have been designed and implemented appropriately. Another commenter highlighted that the proposed effective date may be too soon to allow auditors to update methodologies, provide appropriate training and effectively implement the standards. In addition, multiple commenters, mainly accounting firms, suggested that we consider the effective dates for other standard-setting projects when determining the effective date for the amendments.

The Board appreciates the concerns and preferences expressed by the commenters. Having considered the requirements of the final amendments, the differences between the amendments and the existing standards, our understanding of firms' current practices, and the effective dates for other Board rulemaking projects, we believe that the effective date, subject to SEC approval, for audits of financial statements for fiscal years beginning on or after December 15, 2025 will provide auditors with a reasonable time period to implement the final amendments, without unduly delaying the intended benefits resulting from these improvements to PCAOB standards, and is consistent with the Board's mission to protect investors and further the public interest.

* * *

On the 12th day of June, in the year 2024, the foregoing was, in accordance with the bylaws of the Public Company Accounting Oversight Board,

ADOPTED BY THE BOARD.

/s/ Phoebe W. Brown

Phoebe W. Brown
Secretary

June 12, 2024

APPENDIX 1 – AMENDMENTS

Amendments Related to Aspects of Designing and Performing Audit Procedures That Involve Technology-Assisted Analysis of Information in Electronic Form

The Board is adopting amendments to certain PCAOB auditing standards related to aspects of designing and performing audit procedures that involve technology-assisted analysis of information in electronic form, and this appendix sets forth those amendments. The table below is a reference tool for the amendments.

PCAOB Standard	Paragraph(s)	Subject Heading of Paragraph Affected
AS 1105, <i>Audit Evidence</i>	.07	Relevance and Reliability
AS 1105	.08	Relevance and Reliability
AS 1105	.10	Using Information Produced by the Company
AS 1105	.10A (new)	Evaluating the Reliability of External Information Provided by the Company in Electronic Form
AS 1105	.13 – footnote 7	Audit Procedures for Obtaining Audit Evidence
AS 1105	.14	Audit Procedures for Obtaining Audit Evidence
AS 1105	.15	Inspection
AS 1105	.19	Recalculation
AS 1105	.A8 – footnote 5	Appendix A – Using the Work of a Company’s Specialist as Audit Evidence

PCAOB Standard	Paragraph(s)	Subject Heading of Paragraph Affected
AS 2301, <i>The Auditor's Responses to the Risks of Material Misstatement</i>	.10	Responses Involving the Nature, Timing, and Extent of Audit Procedures
AS 2301	.48 (new), .49 (new) and .50 (new)	Tests of Details

Amendments to AS 1105

- I. AS 1105 is amended by revising paragraph .07 to read as follows:

.07 *Relevance.* The relevance of audit evidence refers to its relationship to the assertion or to the objective of the control being tested. The relevance of audit evidence depends on:

- a. The design of the audit procedure used to test the assertion or control, in particular whether it is designed to (1) test the assertion or control directly and (2) test for understatement or overstatement;
- b. The timing of the audit procedure used to test the assertion or control; and
- c. The level of disaggregation or detail of information necessary to achieve the objective of the audit procedure.

- II. AS 1105 is amended by revising paragraph .08 to read as follows:

.08 *Reliability.* The reliability of evidence depends on the nature and source of the evidence and the circumstances under which it is obtained. In general:

- Evidence obtained from a knowledgeable source that is independent of the company is more reliable than evidence obtained only from internal company sources.

Note: See Appendix A of this standard for requirements related to the evaluation of evidence from a company's specialist.

- Information produced by the company and information that the company received from one or more external sources in electronic form are more reliable when the company's controls over that information including, where applicable, its

information technology general controls and automated application controls, are effective.

- Evidence obtained directly by the auditor is more reliable than evidence obtained indirectly.
- Evidence provided by original documents is more reliable than evidence provided by photocopies or facsimiles, or documents that have been filmed, digitized, or otherwise converted into electronic form, the reliability of which depends on the controls over the conversion and maintenance of those documents.

Note: If a third party provides evidence to an auditor subject to restrictions, limitations, or disclaimers, the auditor should evaluate the effect of the restrictions, limitations, or disclaimers on the reliability of that evidence.

- III. AS 1105 is amended by revising paragraph .10 and adding footnote 3A to paragraph .10, to read as follows:

.10 When using information produced by the company as audit evidence, the auditor should evaluate whether the information is sufficient and appropriate for purposes of the audit by performing procedures to:³

- Test the accuracy and completeness of the information, or test the controls over the accuracy and completeness of that information, including, where applicable, information technology general controls and automated application controls;^{3A} and
- Evaluate whether the information is sufficiently precise and detailed for purposes of the audit.

³ When using the work of a company's specialist, see Appendix A of this standard. When using information produced by a service organization or a service auditor's report as audit evidence, see AS 2601, *Consideration of an Entity's Use of a Service Organization*, and for integrated audits, see AS 2201, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*.

^{3A} For situations involving information in electronic form, see paragraph .17 of AS 2301, *The Auditor's Responses to the Risks of Material Misstatement*.

- IV. AS 1105 is amended by adding, after paragraph .10, a new subheading, and new paragraph .10A and footnote 3B:

Evaluating the Reliability of External Information Provided by the Company in Electronic Form

.10A The company may provide to the auditor information in electronic form that the company received from one or more external sources.^{3B} When using such information as audit evidence, the auditor should evaluate whether the information is reliable for purposes of the audit by:

- a. Obtaining an understanding of (i) the source from which the company received the information; and (ii) the company's process by which such information was received, maintained, and, where applicable, processed, which includes understanding the nature of any modifications made to the information before it was provided to the auditor; and
- b. Testing the information to determine whether it has been modified by the company and evaluating the effect of those modifications; or testing controls over receiving, maintaining, and processing the information (including, where applicable, information technology general controls and automated application controls).

^{3B} Such information includes, for example, cash receipts, shipping documents, and purchase orders.

- V. AS 1105 is amended by revising footnote 7 to paragraph .13 to read as follows:

⁷ AS 2301.

- VI. AS 1105 is amended by revising paragraph .14 and adding footnote 7A to paragraph .14 to read as follows:

.14 Paragraphs .15-.21 of this standard describe specific audit procedures. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure. If the auditor uses an audit procedure for more than one purpose, the auditor should achieve each objective of the procedure.^{7A}

^{7A} AS 2110 establishes requirements regarding the process of identifying and assessing risks of material misstatements of the financial statements. AS 2301 establishes requirements regarding designing and implementing appropriate responses to the risks of material misstatement, including tests of controls and substantive procedures.

- VII. AS 1105 is amended by revising paragraph .15 and adding footnote 7B to paragraph .15, to read as follows:

.15 Inspection involves examining information, whether internal or external, in paper form, electronic form, or other media, or physically examining an asset. Inspection of information provides audit evidence of varying degrees of reliability, depending on the nature and source of the information and the circumstances under which the information is obtained.^{7B} An example of inspection used as a test of controls is inspection of records for evidence of authorization.

^{7B} See paragraph .08 of this standard.

- VIII. AS 1105 is amended by revising paragraph .19 to read as follows:

.19 Recalculation consists of checking the mathematical accuracy of information.

- IX. AS 1105 is amended by revising footnote 5 to paragraph .A8 to read as follows:

⁵ See paragraphs .07, .08, and .10A of this standard.

Amendments to AS 2301

- X. AS 2301 is amended by revising paragraph .10 to read as follows:

.10 The audit procedures performed in response to the assessed risks of material misstatement can be classified into two categories: (1) tests of controls and (2) substantive procedures.⁹ Paragraphs .16-.35 of this standard discuss tests of controls, and paragraphs .36-.46 and .48-.50 discuss substantive procedures.

Note: Paragraphs .16-.17 of this standard discuss when tests of controls are necessary in a financial statement audit. Ordinarily, tests of controls are performed for relevant assertions for which the auditor chooses to rely on controls to modify his or her substantive procedures.

⁹ Substantive procedures consist of (a) tests of details of accounts and disclosures and (b) substantive analytical procedures.

- XI. AS 2301 is amended by adding, after paragraph .47, a new subheading, and new paragraphs .48-.50 to read as follows:

Tests of Details

.48 A test of details involves performing audit procedures with respect to items included in an account or disclosure (e.g., the date, amount, or contractual terms of a transaction). When performing a test of details, the auditor should apply audit procedures that are appropriate to the particular audit objectives to each item selected for testing.²¹

²¹ AS 1105 describes the alternative means of selecting items for testing: selecting all items, selecting specific items, and audit sampling. See AS 1105.22-.28.

.49 When performing a test of details, the auditor may identify items that require further investigation.²² Audit procedures that the auditor performs to investigate the identified items are part of the auditor's response to risks of material misstatement. The auditor determines the nature, timing, and extent of such procedures in accordance with PCAOB standards.²³ The auditor's investigation of the identified items should include determining whether these items individually or in the aggregate indicate (i) misstatements that should be evaluated in accordance with AS 2810, *Evaluating Audit Results*, or (ii) deficiencies in the company's internal control over financial reporting.²⁴

²² For example, an auditor may identify balances or transactions that contain a certain characteristic or that are valued outside of a range.

²³ See, e.g., AS 2315, which describes the auditor's responsibilities for evaluating sampling results when tests of details involve audit sampling, and paragraph .50 of this standard when tests of details involve specific items selected for testing.

²⁴ In an integrated audit of financial statements and internal control over financial reporting, the auditor should perform the evaluation in accordance with AS 2201. In an audit of financial statements only, the auditor should follow the direction of AS 2201.62-.70, as stated in AS 1305.03.

.50 When the auditor selects specific items²⁵ within an account or disclosure for testing, the auditor should determine whether there is a reasonable possibility that remaining items within the account or disclosure include a misstatement that, individually or when aggregated with others, would have a material effect on the financial statements.²⁶ If the auditor determines that there is a reasonable possibility of such a risk of material misstatement in the items not selected for testing, the auditor should perform substantive procedures that address the assessed risk.²⁷

²⁵ See AS 1105.25-.27.

²⁶ See AS 2110.

²⁷ See paragraphs .08 and .36 of this standard.

APPENDIX 2 – CONFORMING AMENDMENTS

In connection with the amendments to AS 1105, *Audit Evidence*, and AS 2301, *The Auditor’s Responses to the Risks of Material Misstatement*, the Board is adopting conforming amendments¹ to AS 2501, *Auditing Accounting Estimates, Including Fair Value Measurements*.

- I. AS 2501 is amended by revising paragraph .12 to read as follows:

.12 AS 1105 requires the auditor, when using information produced by the company as audit evidence, to evaluate whether the information is sufficient and appropriate for purposes of the audit by performing procedures to (1) test the accuracy and completeness of the information or test the controls over the accuracy and completeness of that information including, where applicable, information technology general controls and automated application controls, and (2) evaluate whether the information is sufficiently precise and detailed for purposes of the audit.¹³

¹³ See AS 1105.10.

- II. AS 2501 is amended by revising footnote 14 to paragraph .13 to read as follows:

¹⁴ See AS 1105.07, .08, and .10A. Appendix B of AS 1105 describes the auditor’s responsibilities for obtaining sufficient appropriate audit evidence in situations in which the valuation of an investment is based on the investee’s financial results.

¹ “Conforming amendments” refers to technical changes to existing PCAOB standards, such as changes to cross-references and terminology.