SECTION 400

Testing Phase

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410 – Overview of the Testing Phase

1. Audit evidence is all the information that auditors use to reach conclusions contained in auditor’s reports and includes the information in the accounting records underlying the financial statements and other information (AU‑C 500.05). During the testing phase of the audit, the auditor gathers sufficient appropriate audit evidence to report on

* the entity’s financial statements;
* the entity’s internal control;
* whether the entity’s financial management systems are in substantial compliance with the three requirements of Federal Financial Management Improvement Act of 1996 (FFMIA) (for Chief Financial Officers Act of 1990 (CFO Act) agencies); and
* the entity’s compliance with significant provisions of applicable laws, regulations, contracts, and grant agreements.

When using information produced by the entity, the auditor should evaluate whether the information is sufficiently reliable for the auditor’s purposes, including, as necessary, in the following circumstances (1) obtaining audit evidence about the accuracy and completeness of the information and (2) evaluating whether the information is sufficiently precise and detailed for the auditor’s purposes (AU-C 500.09).

1. Audit sampling is often used in audit testing.[[1]](#footnote-1) The auditor uses professional judgment,[[2]](#footnote-2) as well as knowledge of sampling methods, in applying audit sampling. When designing an audit sample, the auditor should consider the purpose of the audit procedure and the characteristics of the population from which the sample will be drawn (AU-C 530.06). FAM 400 provides a framework for applying audit sampling to financial audits but is not a comprehensive discussion. Additional background and guidance on audit sampling is provided in the American Institute of Certified Public Accountants’ (AICPA) audit guide, *Audit Sampling*.

The auditor generally should consult with an audit sampling specialist for assistance in designing and evaluating audit samples and in evaluating the costs and benefits when deciding the appropriate type of audit sampling to use, unless the auditor determines only basic statistical concepts are applied.

1. During this phase, the auditor performs activities for each type of test to

* determine the nature, extent, and timing of further audit procedures (FAM 420);
* design tests (FAM 430); and
* perform tests and evaluate results (FAM 440).

1. The types of procedures performed in the testing phase are as follows:

* **Sampling control tests** that may be performed by the auditor to obtain evidence about achieving specific control objectives. If the auditor obtains sufficient evidence regarding the effectiveness of controls through control tests performed in the internal control phase (see FAM 360), sampling control tests are not necessary. Further guidance on sampling control tests is in FAM 450.
* **Compliance tests** are performed by the auditor to obtain evidence about compliance with significant provisions of applicable laws, regulations, contracts, and grant agreements. Further guidance on compliance tests is in FAM 460.
* **Substantive procedures** are performed by the auditor to obtain evidence that provides reasonable assurance about whether the financial statements and related assertions are free of material misstatement. Further guidance on substantive procedures is in FAM 470, FAM 475, and FAM 480.

1. Audit documentation of the nature, extent, and timing of procedures performed during this test phase, as well as conclusions reached, is discussed in FAM 490.

420 – Design the Nature, Extent, and Timing of Further Audit Procedures

Design Further Audit Procedures

1. As discussed in FAM 200 (Planning Phase) and FAM 300 (Internal Control Phase), the auditor performs risk assessments in planning procedures for obtaining audit evidence about control effectiveness and about assertions in account balances and classes of transactions. Audit evidence is all the information that auditors use to reach conclusions contained in auditor’s reports. Obtaining evidence is a cumulative process.
2. If information to be used as audit evidence has been prepared using the work of a management’s specialist (those with expertise in a field other than accounting or auditing, such as actuarial calculations, valuations, or engineering data), see FAM 625.
3. The auditor should design and implement overall responses to address the assessed risks of material misstatement at the financial statement level (AU‑C 330.05). In designing substantive tests, the auditor should design audit procedures whose nature, extent, and timing are based on and are responsive to the assessed risk of material misstatement at the relevant assertion level, and should (AU-C 240.30 and 330.06) do the following:

* Consider the reasons for the assessed risk of material misstatement at the relevant assertion level for each class of transactions, account balance, and note disclosure, including (a) the likelihood of material misstatement due to the particular characteristics of the relevant class of transactions, account balance, or note disclosure (the inherent risk) and (b) whether the risk assessment takes account of relevant controls (the control risk), thereby requiring the auditor to obtain audit evidence to determine whether the controls are operating effectively (that is, the auditor intends to rely on the operating effectiveness of controls in determining the nature, timing, and extent of substantive procedures).
* Obtain more persuasive audit evidence the higher the auditor’s assessment of risk. (AU-C 330.07)

The design of specific audit procedures is further discussed in FAM 430; sampling control tests in FAM 450; compliance tests in FAM 460; FFMIA tests in FAM 701 and 701 A; and substantive procedures in FAM 470, FAM 475, and FAM 480.

Determine the Nature of Tests

1. Further audit procedures consist of tests of controls and substantive procedures. The auditor should determine the nature of sampling control tests, compliance tests, and substantive procedures that will achieve the audit objectives.
2. Substantive procedures are classified as either substantive analytical procedures or detail tests. Substantive analytical procedures involve comparing the recorded test amount with the auditor’s expectation of the recorded amount and investigating any significant differences between these amounts. Further information on substantive analytical procedures is in FAM 475.
3. When designing and performing audit procedures, the auditor should consider the relevance and reliability of the information to be used as audit evidence (AU‑C 500.07). The higher the auditor’s assessment of risk of material misstatement, the more reliable and relevant the audit evidence from substantive procedures needs to be. The auditor should determine the nature of the population and the objectives of the test procedures.

Determine the Extent of Tests

1. For each type of test, the auditor should determine the extent of tests to be performed. The extent of sampling control tests is a function of the auditor’s preliminary assessment of the risk of material misstatement, tolerable rate of deviation, and the rate of control deviations expected.[[3]](#footnote-3) The extent of compliance tests is a function of the effectiveness of compliance controls. The extent of substantive procedures is a function of the risk of material misstatement, expected misstatement, and tolerable misstatement.

Determine the Timing of Tests

1. If substantive procedures are performed at an interim date, the auditor should cover the remaining period by performing (a) substantive procedures, combined with tests of controls for the intervening period, or (b) if the auditor determines that it is sufficient, further substantive procedures only, that provide a reasonable basis for extending the audit conclusions from the interim date to the period-end (AU-C 330.23). As discussed in FAM 295 D, the auditor may conduct tests before the date of the financial statements (interim testing) or conduct all tests as of the date of the financial statements. FAM 495 C provides guidance on interim testing, tests of the period between the interim date and the date of the financial statements (the roll-forward period), and related documentation.

430 – Design Tests

1. After considering the risk of material misstatement discussed in FAM 420, the auditor should design specific tests to be performed. To realize efficiencies in tests that involve audit sampling, the auditor can perform several tests on a common sample (multipurpose testing).[[4]](#footnote-4) The auditor generally should minimize the number of separate sampling applications performed on the same population by attempting to effectively achieve as many objectives as possible using the items selected for testing.
2. When designing control, compliance, and detail tests, the auditor should determine the means of selecting items for testing that are effective in meeting the purpose of the audit procedure (AU-C 330.25). Items can be selected using either audit sampling methods or nonstatistical selection. Audit sampling methods involve selecting individual items from a population with the objective of reaching a conclusion on all the items in the population. Audit sampling can be either statistical (intended to be representative of and statistically projected to the population) or nonstatistical (intended to be representative of but not statistically projectable to the population). Nonstatistical selection involves selecting items to reach a conclusion only on the items tested.

For control tests, the auditor generally should use nonstatistical selection (FAM 360) or statistical sampling (FAM 450). For compliance tests, the auditor generally should use statistical sampling (FAM 460). For detail tests, the auditor may use any of the selection methods (i.e., nonstatistical selection, statistical sampling, and nonstatistical sampling) discussed in FAM 480, as appropriate.

1. When determining the selection method to use during a multipurpose test, the auditor generally should use the selection method appropriate for substantive detail tests in the particular situation. This selection method is usually the most efficient because generally sampling control and compliance tests may be based on any type of audit sample.

For example, the auditor may use a statistical sample of property additions to (1) substantively test the amount of additions and (2) test financial reporting controls over property acquisition. If a substantive test would require 135 sample items selected using monetary unit sampling (MUS) and if the test of financial reporting controls would require 45 sample items, the auditor may either test controls relating to all 135 sample items or select a separate sample of 45 sample items from the general population for control testing.

1. In using multipurpose testing, the auditor may have begun substantive procedures before determining whether the test of controls supports the auditor’s assessed level of control risk. Therefore, an auditor planning to use multipurpose testing will have made a preliminary judgment that there is an acceptably low risk that the rate of deviations from the prescribed control in the population exceeds the tolerable rate of deviations the auditor is willing to accept without altering the planned assessed level of control risk (see the AICPA’s audit guide, *Audit Sampling*).

It should be noted that multipurpose tests may not be efficient if conducted during the first 2 years of a new audit. This is because the auditor may not be as aware of the operating effectiveness of the controls in place at an entity in a new audit, and the rate of deviation may be higher than expected.

440 – Perform Tests and Evaluate Results

1. The auditor should perform the planned tests as designed in FAM 420 and FAM 430 and should evaluate the results of each type of test separately, without respect to whether the items were chosen as part of a multipurpose test. Guidance on performing and evaluating the results is presented for each type of test in the following sections:

* FAM 450 – Sampling Control Tests
* FAM 460 – Compliance Tests
* FAM 470 – Substantive Procedures

1. The auditor should evaluate (a) the results of the audit sample, including sampling risk, and (b) whether the use of audit sampling has provided a reasonable basis for conclusions about the population that has been tested (AU-C 530.14)

If the results of tests are different from what was expected during design of the tests, the auditor may want to expand the audit sample to test additional items; however, this is usually not appropriate. In a well-designed audit sample, the expanded sample will not usually materially change the sample results. For MUS and attribute samples, unless the auditor plans for the expansion of the sample in advance,[[5]](#footnote-5) expansion of the sample is generally not appropriate. See the AICPA’s audit guide, *Audit Sampling,* for further guidance. The auditor should consult with the audit sampling specialist before expanding any samples (see FAM 450.20, FAM 460.02, and FAM 480.29).

1. The auditor should evaluate the effect of the findings of the substantive procedures performed in the audit of financial statements on the effectiveness of internal control over financial reporting. This should include, at a minimum, the following:

* The risk assessments in connection with the selection and application of substantive procedures, especially those related to fraud.
* Findings with respect to illegal acts and transactions with disclosure entities, related parties, and public-private partnerships.
* Indications of management bias in making accounting estimates and in selecting accounting principles.
* Misstatements detected by substantive procedures. The extent of such misstatements might alter the auditor’s judgment about the effectiveness of controls. The absence of misstatements detected by substantive procedures, however, does not provide audit evidence that controls related to the relevant assertion being tested are effective (AU-C 330.16).

Evaluate the Risk of Material Misstatement

1. Evaluating the risk of material misstatement due to errors or fraud is a cumulative, ongoing process throughout the audit (as discussed in FAM 260). During testing, the auditor may become aware of additional fraud risk factors or other conditions that may affect the auditor’s evaluation of the risk of material misstatement, such as

* discrepancies in the accounting records,
* conflicting or missing evidential matter, or
* problematic or unusual relationships between management and the entity being audited.

In response to fraud risk factors or other conditions, the auditor should evaluate whether to perform additional or different audit procedures (see FAM 540.21–.23), including consultation with the Special Investigator Unit and Office of the General Counsel (OGC).

450 – Perform Sampling Control Tests

1. The auditor should design and perform tests of controls to obtain sufficient appropriate audit evidence about the operating effectiveness of relevant controls if

* the auditor’s assessment of the risks of material misstatement at the relevant assertion level includes an expectation that the controls are operating effectively (that is, the auditor intends to rely on the operating effectiveness of controls in determining the nature, timing, and extent of substantive procedures) or
* substantive procedures alone do not provide sufficient appropriate audit evidence at the relevant assertion level (AU-C 330.08).

In designing and performing tests of controls, the auditor should obtain more persuasive audit evidence the greater the reliance the auditor places on the effectiveness of a control (AU-C 330.09). For entities subject to Office of Management and Budget (OMB) audit guidance, for controls that have been suitably designed and implemented, the auditor should perform sufficient tests to support a low level of assessed control risk.

1. The auditor may test controls that provide documentary evidence of their existence and application by inspecting this evidence. If the auditor cannot obtain sufficient evidence by performing control tests in the internal control phase (see FAM 360), the auditor may obtain more evidence by inspecting individual items selected using audit sampling procedures in the testing phase.

For efficiency, the auditor may use a single statistical sample to test a combination of controls, compliance, and balances (test of details) (i.e., multipurpose testing). Alternatively, the auditor may design a statistical sample to test controls alone. In this case, the auditor should use attribute sampling, selected either randomly or systematically where appropriate, as described beginning in FAM 450.06.

1. When planning sampling control tests, the auditor should determine a sample size sufficient to reduce sampling risk to an acceptably low level (AU-C 530.07). The auditor should determine

* the objectives of the test (including what constitutes a deviation),
* the population (including sampling unit and time frame),
* the method of selecting the statistical sample, and
* the sample design and resulting sample size.

The auditor should include the sampling plan in the audit documentation. See FAM 495 D for example documentation.

Document Objectives of the Tests

1. The auditor should document the objectives of each control test. In designing statistical samples for control tests, the auditor should plan to evaluate operating effectiveness in terms of the rate of deviations in units or dollars from prescribed controls. This involves defining (1) the specific control to be tested and (2) what constitutes an error, exception, or control failure. The auditor should define control deviations in terms of control activities not followed. For example, the auditor may define a deviation in cash disbursements as “invoice not approved and initialed by an authorized individual.”

For financial reporting control tests, the objective is to support the preliminary assessment of control risk as either moderate or low. For compliance and operations control tests, the objective is to support the preliminary assessment of the control as effective. In addition, for financial reporting and compliance control tests, the objective is obtaining evidence to support the auditor’s report on internal control.

Define the Population

1. In defining the population, the auditor should identify the whole set of items on which the auditor needs to reach a conclusion and from which the statistical sample will be drawn. This includes

* describing the population,
* conducting data reliability tests to determine whether the population is complete and valid,
* determining the source document or the transaction documents to be tested, and
* defining the period covered by the test.

When multiple locations are involved, the auditor should determine whether to use one population of all or several locations, or whether to use separate populations. The auditor may be able to use one population if the controls at each location are components of one overall control system. In making this decision, the auditor may evaluate such factors as

* the extent of uniformity of the controls and their applications at each location,
* whether significant changes can be made to the controls or their applications at the local level,
* the amount and nature of centralized oversight or control over local operations, and
* whether there could be a need for separate conclusions for each location.

If the auditor concludes that the locations are separate populations, the auditor should select separate statistical samples at each location and evaluate the results of each statistical sample separately.

Choose Method of Selection

1. The auditor should select items for the statistical sample in such a way that the auditor can reasonably expect the sample to be representative of the relevant population and likely to provide the auditor with a reasonable basis for conclusions about the population (AU-C 530.08). For tests of controls, attribute sampling achieves this objective. Attribute sampling requires random or systematic, if appropriate, selection of sample items without considering the transaction’s dollar amount or other special characteristics. The auditor may also use computer software, such as IDEA, to make random selections.

Determine Sample Size

1. To determine the sample size, the auditor uses professional judgment to determine four factors:

* tolerable rate of deviation of the population to be tested (maximum rate of deviations from the prescribed control that the auditor is willing to accept without altering the preliminary control risk);
* expected rate of deviation of the population to be tested (expected error rate);
* the desired level of assurance (complement of risk of overreliance) that the tolerable rate of deviation is not exceeded by the actual rate of deviation in the population—the auditor may decide the desired level of assurance based on the extent to which the auditor’s risk assessment takes into account relevant controls (AU-C 530.A13); and
* confidence level.

Once the auditor determines these factors, the auditor may use computer software (such as IDEA) to determine sample size and to select statistical samples for testing. The auditor may also use tables I and II in figure 450.1 to determine sample size and to evaluate test results for controls that operate more frequently than weekly.[[6]](#footnote-6)

Figure 450.1: Sample Sizes and Acceptable Numbers of Deviations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 90 percent confidence level | | | | |
| Table I  Tolerable rate of deviation of 5 percent | |  | Table II  Tolerable rate of deviation of 10 percent | |
| (Use for determining sample sizes in all cases) | |  | (Use for evaluating sample results only if preliminary assessment of control risk is low and deviations exceed those in table I) | |
| **Sample size** | **Acceptable number of deviations** |  | **Sample size** | **Acceptable number of deviations** |
| 45 | 0 |  | 45 | 1 |
| 78 | 1 |  | 78 | 4 |
| 105 | 2 |  | 105 | 6 |
| 132 | 3 |  | 132 | 8 |
| 158 | 4 |  | 158 | 10 |

The auditor may use table I to determine the sample sizes necessary to support the preliminary assessments of controls in all cases and to conclude on the effectiveness of the controls. The auditor may use table II to evaluate sample results only when the preliminary assessment of financial reporting control risk is low and the number of deviations found exceeds the acceptable number of deviations from table I.

The AICPA has other examples in its guidance, and the table factors are within the range of the AICPA examples and are statistically valid. If an auditor chooses to use factors other than tables I and II, the auditor generally should consult with the audit sampling specialist.

1. Tables I and II are based on a 90 percent confidence level. The auditor generally uses this confidence level for sampling control tests because the auditor generally obtains additional satisfaction on controls through other audit tests, such as substantive procedures, inquiry, observation, and walk-throughs.
2. Tables I and II are each based on different tolerable rates of deviation. Table I is based on a tolerable rate of deviation of 5 percent, and table II is based on a tolerable rate of deviation of 10 percent. Each table shows various sample sizes and the maximum number of deviations that may be detected in each statistical sample to rely on the controls at the determined control risk level. See FAM 450.12 through .15 for a discussion of the evaluation of test results.
3. For financial reporting controls, if the preliminary assessment of control risk is low or moderate, the auditor may use table I to determine sample size. OMB audit guidance requires the auditor to perform sufficient control tests to support a low level of assessed control risk, if controls have been suitably designed and implemented.

For compliance and operations controls, the auditor may determine sample sizes using table I.

1. The auditor may use the sample size indicated for zero acceptable deviations (45 items) if the auditor expects no deviations. If no deviations are expected, this sample size will be the most efficient for assessing control effectiveness. If no deviations are found, this statistical sample will be sufficient to support the assessment of control risk. However, the auditor may use a larger sample size if control deviations are expected to occur but are not expected to exceed the acceptable number of deviations in table I.

Evaluate Test Results

1. Deviations from controls may be caused by factors such as changes in key personnel, significant seasonal fluctuations in the volume of transactions, and human error. If deviations from controls upon which the auditor intends to rely are detected, the auditor should investigate the nature and cause of the deviations. The investigation should include making specific inquiries to understand these matters and their potential consequences. The auditor should evaluate their possible effect on the purpose of the audit procedure and on other areas of the audit. The auditor should also determine whether (a) the tests of controls that have been performed provide an appropriate basis for reliance on the controls, (b) additional tests of controls (such as compensating controls) are necessary, and (c) the potential risks of misstatement need to be addressed using substantive procedures (AU‑C 330.17 and 530.12). In addition, the auditor should determine whether any misstatements detected from the performance of substantive procedures (see FAM 470, 475, and 480) alter the auditor’s judgment as to the effectiveness of related controls.

Financial Reporting Controls

1. To evaluate sample results, the auditor considers the sample size, the number of deviations, and the confidence level. The auditor may use software (such as IDEA), the tables above, or other tables to evaluate results.[[7]](#footnote-7) If the auditor used table I to determine sample size, and deviations exceed the acceptable number for the sample size, the auditor should follow the guidance below in deciding how to revise the preliminary assessment of control risk.

* Low control risk: If the **preliminary assessment of control risk** is low and if deviations are noted that exceed the acceptable number for table I, but not table II, the auditor may reassess control risk as moderate. For example, if the original statistical sample was 45 items, the auditor may reassess control risk as moderate if there is not more than one deviation. If the auditor finds more than one deviation with a sample size of 45 items, the auditor should conclude that the controls being tested are not operating effectively and should reassess control risk as high. Based on this revised assessment, the auditor would change the risk of material misstatement and would reconsider the nature, extent, and timing of substantive procedures.
* Moderate control risk: If the **preliminary assessment of control risk** is moderate and if control deviations exceed the acceptable number for table I, the auditor should conclude that control risk is high. The preliminary assessment of control risk is based on the assumption that the controls operate as designed. If the preliminary assessment of control risk is moderate and if control tests indicate that the control is not operating as designed (because deviations exceed the acceptable number in table I), the auditor should conclude that the control is ineffective and revise the control risk assessment to high. Based on the revised assessment, the auditor would change the risk of material misstatement and would reconsider the nature, extent, and timing of substantive procedures.

Compliance Controls

1. If the auditor used table I to determine sample size and deviations exceed the acceptable number for the sample sizes shown in the table, the auditor should conclude that the compliance control is not effective. The auditor also should determine whether any deviations noted ultimately resulted in noncompliance with a significant provision of an applicable budget-related or other law, regulation, contract, or grant agreement. Based on the revised assessment, the auditor would change the risk of noncompliance and would reconsider the nature, extent, and timing of tests of compliance.

Operations Controls

1. If the auditor used table I to determine sample size and deviations exceed the acceptable number for the sample sizes shown in the table, the auditor should conclude that the operations control is not effective.

Other Considerations

1. The auditor should perform audit procedures, appropriate to the purpose, on each item selected (AU-C 530.09). If the designed audit procedure is not applicable to the selected sample item, the auditor should perform the procedure on a replacement item (AU-C 530.10). An example of when it is necessary to perform the procedure on a replacement item is when a voided check is selected while testing for evidence of payment authorization. If the auditor is satisfied that the check has been properly voided such that it does not constitute a deviation, an appropriately chosen replacement is examined (AU-C 530.A18). Consult with the audit sampling specialist to select replacement items.
2. If the auditor is unable to apply the designed audit procedures, or suitable alternative procedures, to a selected item, the auditor should treat that item as a deviation from the prescribed control (in the case of tests of controls) or a misstatement (in the case of tests of details; see FAM 480) (AU-C 530.11).

In some circumstances, the auditor may not be able to apply the planned audit procedures to selected sample items because, for example, the entity might not be able to locate supporting documentation. The auditor's treatment of unexamined items will depend on their effect on the auditor’s evaluation of the statistical sample. If the auditor’s evaluation of the sample results would not be altered by considering those unexamined items to be misstated, it may not be necessary to examine the items, for example, if the aggregate amount of the unexamined items, if treated as misstatements or deviations, would not cause the auditor’s assessment of the amount of the misstatement or deviation in the population to exceed tolerable misstatement or tolerable rate of deviation, respectively. However, when this is not the case, the auditor should perform alternative procedures that provide sufficient appropriate audit evidence to form a conclusion about the sample item and use the results of these procedures in assessing the sample results. If alternative procedures cannot be satisfactorily performed in these cases, the auditor is required to treat the items as misstatements or deviations, as appropriate, in evaluating the results of the statistical sample. AU-C 240, *Consideration of Fraud in a Financial Statement Audit*, also requires the auditor to consider whether the reasons for the auditor’s inability to examine the items have implications with regard to assessing risks of material misstatement due to fraud, the assessed level of control risk that the auditor expects to be supported, or the degree of reliance on management representations. (AU-C 530.A19)

1. If, during the testing of sample items, the number of deviations exceeds the acceptable number of deviations in table I or II (as applicable), the auditor should conclude that controls are not operating effectively and decide whether to stop further testing. In making this decision, the auditor should determine whether there are reasons for continuing to test the remaining sample items. For example, the engagement team may need to determine whether additional information (such as an estimate of the population rate of occurrence) is needed to report control deficiencies as described in FAM 580.56 through .83. An interval estimate may help the auditor decide whether the deficiency is a material weakness, other significant deficiency, or other control deficiency.
2. The auditor should determine which elements of the finding (condition, cause, criteria, possible effect, and recommendation or suggestion) need to be developed. The auditor may decide to include an interval estimate in the report. The auditor should consult with engagement team management and the audit sampling specialist as applicable in deciding whether to complete the testing of the statistical sample.
3. If the auditor finds an unacceptable number of deviations in the original statistical sample and the auditor believes the use of a larger sample size may result in an acceptable number of deviations, the auditor generally should consult with the audit sampling specialist before selecting additional sample items. The auditor should not use a revised sample size and evaluate additional sample items based on tables I or II or on the formulas used by certain audit software, such as IDEA.
4. The auditor should project the results of statistical sampling to the population (AU-C 530.13). The auditor generally should consult with the audit sampling specialist when projecting the rate of sample control deviations to a population for disclosure in a report. If the auditor has used attribute sampling, the auditor should project the deviation rate as a percentage of transactions. If the auditor has used MUS (as part of multipurpose testing), the auditor should project the deviations to the population as a net upper error limit (see FAM 480).

460 – Perform Compliance Tests

1. The type of provision of a law, regulation, contract, or grant agreement and the assessment of the effectiveness of compliance controls affect the nature and extent of compliance testing. Based on the three categories of provisions (as discussed in FAM 245.06), the auditor should perform the applicable compliance tests discussed below.

The auditor should perform audit procedures, appropriate to the purpose, on each item selected (AU-C 530.09). If the designed audit procedure is not applicable to the selected sample item, the auditor should perform the procedure on a replacement item (AU-C 530.10).

Transaction-Based Provisions

1. To test transaction-based provisions, the auditor should use statistical sampling to select specific transactions for compliance testing. The auditor may use the same statistical sample to perform control tests (e.g., financial reporting, compliance, or operations) and substantive tests, as appropriate (see FAM 430 for discussion of multipurpose testing). If the selection is solely for compliance testing, the auditor generally should use a random attribute sample (see FAM 450.06). To determine sample size, the auditor should make judgments as to confidence level, tolerable rate of deviation, and expected population deviation rate. The auditor should determine confidence level based on compliance control risk.

For example, if the auditor determines that compliance controls are effective, the auditor may use an 80 percent confidence level, or if ineffective, a 95 percent confidence level. Tolerable rate of deviation is the rate of transactions not in compliance that could exist in a population without causing the auditor to believe the noncompliance rate is too high. GAO auditors generally use a 5 percent tolerable rate of deviation. Since the auditor will assess the impact of all identified noncompliance, many auditors use zero as the expected population deviation rate. Using the above factors yields the sample sizes in table 460.1.

Table 460.1: Compliance Controls, Confidence Level, and Minimum Sample Size

|  |  |  |
| --- | --- | --- |
| Compliance controls | Confidence level (percentage) | Minimum sample sizea |
| Effective | 80 | 32 |
| Not effective | 95 | 58 |

aThis statistical sample has a tolerable rate of deviation of 5 percent, expected population deviation rate of zero, and a population of more than 5,000 items. If the population is smaller, the auditor may ask the audit sampling specialist to calculate a reduced sample size and evaluate the results.

Since the auditor usually reports compliance on an entity-wide basis, the auditor may use these sample sizes on an entity-wide basis. Evaluation of test results is discussed in FAM 460.06. The auditor should test the entire statistical sample, even if instances of noncompliance are detected. If the auditor assessed compliance controls on a preliminary basis as effective and the results of testing indicated that this assessment is not appropriate, the auditor generally should consult with the audit sampling specialist to determine the appropriate sample size and selection procedures. If the auditor decides to expand the original statistical sample (instead of reselecting an entirely new sample), the auditor should select additional items needed to increase the sample size using the random number used to select the original statistical sample. The audit sampling specialist generally should evaluate results when the auditor expands a test.

Quantitative-Based Provisions

1. Effective compliance controls provide reasonable assurance that the accumulation (or summarization) of transactional information is accurate, complete, and within authorized limits. If compliance controls do not provide such reasonable assurance, the auditor should test the accumulated information directly for existence, completeness, and summarization. Such tests may be performed on either statistical samples or nonstatistical selections. The auditor should design tests to detect misstatements that exceed either an auditor-determined percentage of the total amount of the accumulated information or the amount of the restriction stated in the provision, if any. GAO auditors generally use 5 percent of the total amount of the accumulated information as the tolerable misstatement for this test.

The auditor may discontinue such tests if significant misstatements in the accumulated information are noted that would preclude compliance. The test for compliance is the comparison of the accumulated information with any restrictions on the amounts stated in the identified provision. See FAM 245.06 for a description of these restrictions.

1. If the auditor determines that provisions of applicable budget-related laws and regulations are significant, and if related budget and, consequently, compliance controls are ineffective, the auditor should test the accumulated or summarized information directly for the following potential misstatements in budget execution information:

* **Occurrence/validity:** Recorded amounts are not valid. (See FAM 395 F for occurrence/validity criteria for obligations, expended authority, and outlays.)
* **Completeness:** Not all amounts that should have been recorded are recorded.
* **Cutoff:** Obligations, expended authority, and outlays are not recorded in the proper period.
* **Accuracy:** Obligations, expended authority, and outlays are not recorded at the proper amounts.
* **Classification:** Obligations, expended authority, and outlays are not recorded in the proper account by program and by object, if applicable, including the proper appropriation year if the account has multiple years. (Examples of program and object classifications are provided in FAM 395 F.)
* **Summarization:** Transactions are not properly summarized to the respective account totals.

An example of audit procedures to test for these misstatements is included in FAM 495 B.

Procedural-Based Provisions

1. In testing compliance controls relating to a procedural-based provision, the auditor should obtain sufficient evidence to conclude whether the entity performed the procedure and therefore complied with the provision. An example of a procedural-based provision could be when an entity is required to obtain certain information from grantees. In this case, the auditor would obtain evidence of whether such information was received and therefore whether the entity complied with the provision. If compliance control tests do not provide sufficient evidence to determine compliance, the auditor should perform additional procedures, as necessary, to obtain such evidence.

Evaluating Test Results

1. For any suspected instances of noncompliance noted in connection with the procedures described above or other audit procedures, the auditor should do the following:
2. Obtain (1) an understanding of the nature of the noncompliance and the circumstances in which it occurred and (2) further information to evaluate the possible effect on the financial statements (AU-C 250.17).
3. Investigate the nature and cause of any deviations or misstatements identified and evaluate their possible effect on the purpose of the audit procedure and on other areas of the audit (AU-C 530.12).
4. Discuss the matter with management (at a level above those involved with the suspected noncompliance, if possible) and, when appropriate, those charged with governance. If management or, as appropriate, those charged with governance do not provide sufficient information that supports that the entity is in compliance with significant provisions of applicable laws, regulations, contracts, and grant agreements, and in the auditor’s professional judgment the effect of the suspected noncompliance may be material to the financial statements, the auditor should consider the need to obtain legal advice (AU-C 250.18). If sufficient information about suspected noncompliance cannot be obtained, the auditor should evaluate the effect of the lack of sufficient appropriate audit evidence on the auditor’s opinion (AU-C 250.19).
5. If the auditor suspects that management or those charged with governance are involved in noncompliance, communicate the matter to the next higher level of authority at the entity, if it exists. When no higher authority exists, or if the auditor believes that the communication may not be acted upon or is unsure about the person to whom to report, the auditor should consider the need to obtain legal advice (AU-C 250.23).
6. Discuss such suspected instances of noncompliance with OGC and, when appropriate, the Special Investigator Unit and conclude whether noncompliance has occurred and the implications of any noncompliance.
7. Identify the deficiency in compliance controls that did not prevent or detect and correct the noncompliance, if it was not previously identified during compliance control testing.
8. Report any material weakness and other significant deficiencies in compliance controls and determine the effect, if any, on the report (or opinion) on internal control (see FAM 580.56–.81).
9. Determine the implications of any instances of noncompliance on the financial statements.
10. Determine the implications of any instances of noncompliance in relation to other aspects of the audit, including the auditor’s risk assessment and the reliability of management’s representations (AU-C 250.20).
11. Report instances of noncompliance, as appropriate (see FAM 580.90–.98).

470 – Perform Substantive Procedures – Overview

1. In the internal control phase, the auditor performed a preliminary assessment of the risk of material misstatement for each significant assertion within each significant line item or account (see FAM 370). In the testing phase, the auditor plans and performs further audit procedures to respond to the risk of material misstatement.

Based on the assessed risk of material misstatement, the auditor should design and perform substantive procedures for relevant assertions related to each material class of transactions (such as payroll or nonpayroll expenditures), line items (such as Fund Balance with Treasury (FBWT)), and account balances (such as individual FBWT accounts). However, irrespective of the assessed risks of material misstatement, the auditor should design and perform substantive procedures for all relevant assertions related to each material class of transactions, account balance, and note disclosure (AU-C 330.18). Additionally, if the auditor has determined that an assessed risk of material misstatement at the relevant assertion level is a significant risk, the auditor should perform substantive procedures that are specifically responsive to that risk. When the approach to a significant risk consists only of substantive procedures, those procedures should include tests of details (AU-C 330.22).

1. The auditor’s objective during substantive procedures is to determine whether assertions are materially misstated and to form an opinion about whether the financial statements taken as a whole are presented fairly, in all material respects, in accordance with U.S. generally accepted accounting principles (U.S. GAAP). To determine if assertions are misstated, the auditor should design substantive procedures to detect each of the potential misstatements in assertions that were developed in the internal control phase (see FAM 330).

The auditor’s substantive procedures also should include audit procedures related to the financial statement closing processes, such as

* agreeing or reconciling information in the financial statements with the underlying accounting records, including agreeing or reconciling information in the note disclosures, whether such information is obtained from within or outside of the general ledger and subsidiary ledgers (AU-C 330.21a), and
* examining material journal entries and other adjustments made during the course of preparing the financial statements (AU-C 330.21b).

In addition, the auditor should determine whether efficiencies can be achieved by using the concepts of directional testing, as discussed in FAM 470.15 through .21.

1. As discussed in FAM 260.02, detection risk is the risk that the auditor will not detect a material misstatement that exists in an assertion. Substantive audit assurance is the complement of detection risk and equals 100 percent minus detection risk. The auditor should determine the substantive audit assurance needed based on the risk of material misstatement. The higher the risk of material misstatement, the more substantive audit assurance the auditor needs.

Audit assurance relates to the entire audit and can be achieved using a combination of control tests and substantive tests. The auditor performs control tests to assess the risk of material misstatement. Based on the assessed risk of material misstatement, the auditor determines the substantive audit assurance needed to achieve the desired level of audit assurance for the entire audit. For a desired audit assurance of 95 percent, GAO auditors generally use the minimum substantive audit assurance indicated in table 470.1 for each risk level.

Table 470.1: Risk of Material Misstatement and Minimum Substantive Audit Assurance

|  |  |
| --- | --- |
| **Desired audit assurance of 95 percent** | |
| **Assessed risk of material misstatement based on control tests** | **Minimum substantive audit assurance (percentage)** |
| Low | 63 |
| Moderate | 86 |
| High | 95 |

Types of Substantive Procedures

1. There are two types of substantive procedures: (1) substantive analytical procedures and (2) tests of details. To achieve the substantive audit assurance as discussed above, the auditor may use either of these tests or a combination of the two. The type of test to use and the amount of reliance to place on each type of procedure is a matter of the auditor’s professional judgment, including considerations of audit effectiveness and efficiency. To determine an appropriate mix of substantive procedures, the auditor may use the audit matrix in FAM 470.11.

Substantive Analytical Procedures

1. Substantive analytical procedures involve the auditor comparing a recorded amount with an expectation of that amount and subsequently investigating any significant differences to conclude on the recorded amount. Analytical procedures involve the auditor analyzing plausible relationships among both financial and nonfinancial data. A basic premise is that plausible relationships among data may reasonably exist and continue in the absence of errors, fraud, or changes in circumstances (see AU-C 520).
2. The auditor may perform substantive analytical procedures at one of three levels for an assertion:

* **Complete:** The auditor relies solely on substantive analytical procedures for all of the assurance required from substantive procedures. The procedure is so persuasive that the auditor believes that it is highly likely to detect any aggregate misstatements that exceed performance materiality. Complete assurance from substantive analytical procedures requires procedures that are extremely effective and persuasive to serve as the sole source of audit evidence for achieving the audit objective. This level of effectiveness or persuasiveness is very difficult to achieve when risk of material misstatement is high. Therefore, relying completely on analytical procedures for substantive audit assurance in these situations is rare, particularly for balance sheet accounts.
* **Partial:** The auditor relies on a **combination** of analytical procedures and tests of details to obtain an appropriate level of substantive audit assurance. For partial assurance, the auditor believes that the analytical procedures more likely than not will detect any aggregate misstatements that exceed performance materiality.
* **None:** The auditor **does not** rely on analytical procedures for audit assurance, and the auditor will obtain substantive audit assurance from tests of details. In this situation, the auditor may perform supplemental analytical procedures to increase understanding of account balances and transactions but not to provide any additional audit assurance. These procedures are similar in scope to those that the auditor performs on an overall basis at the financial statement level (see FAM 520).

1. To determine whether to perform complete or partial substantive analytical procedures, the auditor should evaluate the effectiveness, or persuasiveness and efficiency, of such procedures. In so doing, the auditor may use the factors discussed in FAM 495 A.

Test of Details

1. Tests of details are procedures applied to individual items that the auditor selects for testing and include the following:

* **External confirmation** of a balance or transaction or the related terms (such as the terms of payment), by obtaining and evaluating direct communication from a third party, such as for accounts receivable or accounts payable. The auditor should consider whether external confirmation procedures are to be performed as substantive audit procedures (AU-C 330.19). The auditor should use external confirmation procedures for accounts receivable, except when one or more of the following is applicable: (a) the overall account balance is immaterial; (b) external confirmation procedures for accounts receivable would be ineffective; or (c) the auditor’s assessed level of risk of material misstatement at the relevant assertion level is low, and the other planned substantive procedures address the assessed risk (AU-C 330.20). The auditor should include in the audit documentation the basis for any determination not to use external confirmation procedures for accounts receivable when the account balance is material (AU-C 330.32). See AU‑C 505 for procedures related to external confirmations.
* **Physical observation** by inspecting, counting, and applying related audit procedures to tangible assets, such as inventory or property, plant, and equipment.
* **Examination** of supporting documents to determine whether a balance is properly stated, such as examining invoices for expenses and the purchase of inventory and property.
* **Recalculation** by checking the mathematical accuracy of entity records by footing, cross-footing, or recomputing amounts and tracing journal postings, subsidiary ledger balances, and other details to corresponding general ledger accounts. For example, the auditor may recalculate unit cost extensions in an inventory list, foot the list (whether prepared manually or by computer), and trace the total to the general ledger amount.

1. The different types of detail tests are often used in combination to provide sufficient substantive audit assurance about an assertion. For example, to test the valuation/accuracy of accounts receivable, the auditor might confirm balances, recalculate the aging schedule, examine documents supporting the aging and specific delinquent accounts, and discuss collectability with management. On the other hand, a single detail test might provide audit assurance about more than one of the five financial statement assertions. For example, a physical observation of inventory may provide evidence about existence, valuation/accuracy, and presentation and disclosure.
2. The minimum extent of detail testing to be performed is based on the risk of material misstatement and the assurance obtained from substantive analytical procedures, as illustrated in the audit matrix in table 470.2.

Determining Mix of Substantive Procedures

1. In determining an appropriate mix of substantive analytical procedures and detail tests, the auditor generally should use the audit matrix in table 470.2, which illustrates the integration of such tests for each level of risk of material misstatement, when the auditor is using a desired audit assurance of 95 percent for the entire audit. For example, the auditor should design tests to achieve a substantive audit assurance of 86 percent for an account or line item in which the assessed risk of material misstatement based on control tests is moderate. To achieve a substantive audit assurance of 86 percent for an account or line item in which partial reliance is placed on analytical procedures, the auditor should design detail tests to achieve a minimum substantive audit assurance of 77 percent.

Table 470.2: Audit Matrix for Desired Audit Assurance of 95 Percent

| **Assessed risk of material misstatement based on control tests** | | | |
| --- | --- | --- | --- |
|  | Substantive audit assurance (from table 470.01) (percentage) | | |
|  |  | Substantive audit assurance from analytical proceduresa | |
|  |  |  | Minimum substantive audit assurance from detail tests (percentage) |
| Low | 63 | Complete | 0 |
| Partial | 50 |
| None | 63 |
| Moderate | 86 | Complete | 0 |
| Partial | 77 |
| None | 86 |
| High | 95 | Complete | 0 |
| Partial | 92 |
| None | 95 |

aComplete assurance from analytical procedures means that procedures are extremely effective and persuasive to serve as the sole source of audit evidence for achieving the audit objective. This level of effectiveness or persuasiveness is very difficult to achieve when risk of material misstatement is high. Therefore, relying completely on analytical procedures for substantive audit assurance in these situations is rare, particularly for balance sheet accounts. See FAM 470.06.

1. Additional factors to consider in determining an appropriate mix of substantive analytical procedures and detail tests include the following:
2. **The nature and significance of the assertion being tested:** Analytical procedures are generally more likely to be effective for assertions related to accounts that reflect the audit period’s activity, such as accounts included in the statement of net cost, than for accounts related to balance sheet accounts or other cumulative balances. Significant assertions generally require more or higher-quality audit evidence that may not be available from analytical procedures.
3. **The nature of the risk of material misstatement:** The auditor should design substantive procedures that address the specific type and level of risk of material misstatement for each assertion. For example, for certain loss claim liabilities, the auditor may design detail tests to search subsequent claim payments for potential liabilities in testing the completeness assertion, while the auditor may use analytical procedures to test the related valuation assertion by evaluating the average amounts per claim.
4. **The availability of different types of evidence:** Using evidence that can be readily obtained may be more efficient. For example, in federal government audits, the auditor may use budgets and other information in performing analytical procedures.
5. **The quality of the types of evidence available:** The higher the quality of a type of evidence, the greater the level of assurance the auditor may derive from it (see FAM 470.14).
6. **The anticipated effectiveness of substantive analytical procedures:** The auditor should use detail tests if substantive analytical procedures are not expected to be effective.
7. When determining the types of substantive procedures to use, the auditor should choose the mix of **effective** procedures that are efficient in combination with sampling control tests and compliance tests.
8. When considering a procedure’s relative effectiveness, the auditor should evaluate the expected quality of the evidence. The quality of evidence obtained in substantive procedures depends highly on the circumstances under which it is obtained. Some generalizations about evidence are as follows:

* Evidence obtained from independent third parties provides a higher level of assurance than evidence obtained from sources in the entity.
* Evidence obtained directly by the auditor through confirmation, physical examination, vouching, or recalculation provides a higher level of assurance than evidence obtained indirectly, such as through inquiry.
* Documentary evidence provides a higher level of assurance than oral representations.
* Evidence obtained at or near the balance sheet date concerning an asset or liability balance provides a higher level of assurance than evidence obtained before or after the balance sheet date, because the audit risk generally increases with the length of the intervening period.
* The lower the control risk associated with an entity’s internal control, the higher the assurance concerning the information subject to that internal control.

Directional Testing

1. In planning tests, the auditor may use the relationships between recorded amounts to help achieve efficiencies. For example, in double-entry accounting, a misstatement in one account affects at least one other related account. This relationship allows the auditor to test more than one account with a single test. Additionally, the relationship between budgetary and proprietary accounts may allow for efficiencies in testing, for example, for undelivered orders and delivered orders—unpaid for budgetary accounts and expenses and accounts payable for proprietary accounts.
2. As stated, in double-entry accounting, a misstatement in one account affects at least one other related account. For example, a misstatement of accrued payroll typically results in a misstatement of payroll expense. In this example, substantive procedures performed on accrued payroll usually will detect any misstatements in both accrued payroll and payroll expense. In designing substantive procedures after considering risk of material misstatement and developing an understanding of each related account, the auditor should determine the effect of tests on related accounts. For example, a test of revenue for completeness may provide substantive evidence about the completeness of accounts receivable.

Where the entity uses double-entry accounting, the auditor may (1) design an overall audit strategy that tests certain accounts substantively for either existence or completeness (the two assertions most affected by testing related accounts) and (2) rely on such tests to detect misstatements in the related accounts. For example, the auditor may test (1) assets and expenses directly for existence and (2) liabilities, equity, and revenue for completeness, thereby indirectly testing the related accounts for existence or completeness, as applicable. This logic is called a directional testing approach.

1. In some instances, the auditor may supplement a directional testing approach to address a specific risk of material misstatements. For example, if cutoff is a significant risk, the auditor may test both existence and completeness assertions in a test of cutoff as of the balance sheet date. During initial financial statement audits, the auditor generally should test both existence and completeness directly, when those assertions are significant, because the cumulative knowledge about the interaction of accounts may be limited.
2. The audit assurance that can be obtained from directional testing is diminished in balance-sheet-only audits if related accounts are not also tested and in audits of entities having single-entry accounting systems (since double-entry account interrelationships do not exist). In these instances, the auditor should test both existence and completeness directly when those assertions are significant.
3. The auditor may combine the testing of budgetary and proprietary accounts when appropriate. For example, the auditor may combine tests of outlays on the statement of budgetary resources with tests of cash disbursements used to test net costs.
4. If an entity has budget accounting records but does not maintain separate proprietary accounting records, or the proprietary records are incomplete, the auditor should directly test expended authority produced by the budget system and the items necessary to reconcile the budget to the proprietary accounts.
5. Also, if (1) relevant budget restrictions relate to significant quantitative-based provisions of laws and regulations and (2) budget controls are not effective, the auditor should test the accumulated or summarized information directly (see FAM 460.03–.04).

475 – Perform Substantive Analytical Procedures

1. This FAM section provides guidance on the application of substantive analytical procedures. These procedures consist of evaluations of financial information made through analysis of plausible relationships among both financial and nonfinancial data. Analytical procedures also encompass the investigation of identified fluctuations and relationships that are inconsistent with other relevant information or deviate significantly from predicted amounts (AU-C 520.04).

The auditor develops an expectation or estimate of the recorded amount based on an analysis and understanding of relationships between the recorded amounts and other data. This expectation is then used to form a conclusion on the recorded amount. A basic premise underlying analytical procedures is that plausible relationships among data may reasonably be expected to exist and continue unless conditions have changed or the data are misstated. The reasons that make relationships plausible are an important consideration because data sometimes appears to be related when it is not, which may lead the auditor to erroneous conclusions. In addition, the presence of an unexpected relationship may provide important evidence when appropriately scrutinized (AU-C 520.A6). (For further information, refer to AU-C 520 or the AICPA audit guide, *Analytical Procedures*.)

1. Scanning account detail and recomputation are two other audit procedures related to substantive analytical procedures. Scanning consists of searching for unusual items in the detail of account balances. Scanning is an appropriate tool for investigating the cause of a significant fluctuation, but it is not a substantive analytical procedure on its own. The auditor should investigate unusual items identified through scanning to obtain substantive audit assurance about the cause of the fluctuation. For example, the auditor identifies an unusual fluctuation in the property balance when performing other substantive procedures. In scanning a detail listing of vehicles, the auditor may find an auto valued at $600,000, which appears unusually high. Further investigation finds that the decimal point was misplaced when the data was entered, and the vehicle should be recorded at $6,000.

The auditor may also independently compute an estimate of an account balance, which is sometimes referred to as recomputation or an overall test of reasonableness. These recomputations are considered substantive analytical procedures. When making recomputations, the auditor should assess the reliability of the data used and should follow the steps used for performing substantive analytical procedures. An example is recomputing the amount of depreciation expense on equipment using the accounting method, useful life, and date an asset was placed into service.

1. The risk of forming the incorrect conclusion on the account balance tested may be higher for substantive analytical procedures than for detail tests because of the extensive use of the auditor’s professional judgment. Accordingly, quality control is of critical importance. To help maintain quality in these procedures, experienced engagement team personnel usually perform, or closely supervise and review, the assessment of the reliance to place on procedures, design of procedures, and formulation of conclusions as a result of procedures.

Designing and Performing Substantive Analytical Procedures

1. When determining whether performing substantive analytical procedures will be effective and efficient as a substantive test, see FAM 495 A for guidance. In designing and performing substantive analytical procedures, as discussed in AU‑C 520.05, the auditor should do the following:
2. Determine the suitability of particular substantive analytical procedures for given assertions, taking into account the assessed risks of material misstatement and tests of details, if any, for these assertions.
3. Evaluate the reliability of data from which the auditor’s expectation of recorded amounts or ratios is developed, taking into account the source, comparability, and nature and relevance of information available and controls over preparation.
4. Develop an expectation of recorded amounts or ratios and evaluate whether the expectation is sufficiently precise (taking into account whether substantive analytical procedures are to be performed alone or in combination with tests of details) to identify a misstatement that individually or when aggregated with other misstatements, may cause the financial statements to be materially misstated.
5. Determine the amount of any difference of recorded amounts from expected values that is acceptable without further investigation and compare the recorded amounts, or ratios developed from recorded amounts, with the expectations. This is also referred to as the limit. The determination of the limit is a matter of the auditor’s judgment, although some guidelines are provided in FAM 475.05.
6. Obtain explanations from management for differences that exceed the limit, since such differences are significant. Obtain appropriate audit evidence to corroborate management’s explanations for significant differences (AU‑C 520.07). This is discussed further in FAM 475.08 through .11.
7. Determine whether the explanations and corroborating evidence provide sufficient evidence for the desired level of substantive audit assurance. If unable to obtain a sufficient level of substantive audit assurance from substantive analytical procedures, the auditor should perform additional procedures, as discussed in FAM 475.12 through .17, and evaluate whether the difference represents a misstatement (AU-C 520.07).
8. Evaluate whether the assessment of risk of material misstatement remains appropriate, particularly in light of any misstatements identified. Revise the assessment of risk of material misstatement, if necessary, and consider the effects on the extent of detail tests.
9. Document on the Summary of Uncorrected Misstatements (as discussed in FAM 540.07–.10) the amount of any misstatements detected by substantive analytical procedures and their estimated effects. Note that the amount of any misstatement does not include the amount of the limit, which is the amount of the difference between the recorded amount and the expectation that does not require explanation.
10. Conclude on the reasonableness of the recorded amount.
11. Include documentation of work performed, results, and conclusions. See FAM 490.

The auditor may consider testing the operating effectiveness of controls, if any, over the entity’s preparation of information used by the auditor in performing substantive analytical procedures. When such controls are effective, the auditor may have greater confidence in the reliability of the information and therefore in the results of analytical procedures (AU-C 520.A19).

Establishing the Limit

1. As discussed above, the limit is the amount of the difference between the expected and recorded amounts that can be accepted without further investigation. The auditor generally should use the following guidelines in establishing the limit for each level of reliance on analytical procedures for substantive audit assurance:

* Complete reliance: The limit is 20 percent or less of performance materiality.
* Partial reliance: The limit is 30 percent or less of performance materiality.
* No reliance: Substantive analytical procedures are not needed.

Auditors should document the basis for the limit used.

Investigating Significant Differences

Causes of Significant Differences

1. Differences between the expectation and the recorded amount relate to either factors not included in the model (such as specific unusual transactions or changes in accounting policies), a lack of preciseness of the model, or misstatements (either errors or fraud). The auditor’s objective in investigating significant differences is to determine whether they represent misstatements or one of the other factors.

Amount of Difference to Be Explained

1. When obtaining explanations, the auditor should discuss with management the model and assumptions used to develop the expectation. Management will then be in a better position to provide the auditor with a relevant explanation. If the amount of the difference exceeds the limit, the auditor should ask management to provide an explanation for the entire difference between the recorded amount and the expectation. However, the auditor may decide to stop if the explanation covers the portion of the difference that exceeds the limit (see fig. 475.1). If the difference does not exceed the limit, an explanation is not required. The auditor should identify and corroborate all significant factors that cause the expectation to differ from the actual amount, regardless of whether the factors increase or decrease the difference.

Figure 475.1: Explanations When Recorded Amount Exceeds Limit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Recorded amount |  |  |  |  |
|  |  |  | Minimum to explain |
|  |  |  |  |
| Limit |  |  |  |
|  |  |  | May not need explanation |
|  |  |  |  |
| Expectation |  |  |  |
|  |  |  |  |

Corroboration of Explanations

1. The relevance and reliability of corroborating evidence may vary significantly. Therefore, the extent of corroboration of explanations is left to the auditor’s professional judgment. Corroboration may consist of examining supporting documentation or corroborating explanations from personnel in the accounting department and personnel in the appropriate operating department knowledgeable about the entity’s operations.

The auditor should quantify and address the direction and magnitude of the event that caused the fluctuation and corroborate explanations received. The auditor should determine whether sufficient corroborating evidence has been obtained based on the guidelines for complete and partial assurance discussed in FAM 470.06. In evaluating explanations, the auditor should also determine whether the difference is caused by error or fraud.

Example of an Adequate Explanation for a Significant Fluctuation

1. Assume that the auditor assessed performance materiality to be $25 million. Additionally, assume that the auditor has determined, after evaluating the risk of material misstatement, to perform a substantive analytical procedure with a limit of $5 million. The auditor estimated interest expense at $80 million by multiplying the average loan balance of $1 billion by an average interest rate of 8 percent. Both of these averages were computed through a simple average of beginning-of-year and end-of-year amounts. The recorded amount of interest expense, $95 million, is higher than the estimated amount by $15 million and exceeds the limit by $10 million.
2. An explanation from management that “we borrowed more money this year and interest rates are higher than last year” would not be adequate, as it explains why interest is likely to be higher but not how much higher (it corroborates direction, not amount). The auditor should ask management to quantify the explanation by indicating when interest rates changed and when amounts borrowed changed. The auditor should then corroborate the information provided.
3. An example of an adequate explanation follows.

Management determined that interest rates increased during the year and then fell and were computed to average 9 percent based on the attached monthly weighted average. Additionally, $100 million was borrowed and repaid during the year, and the additional borrowings were outstanding for 6 months. Therefore, the average loan balance was actually $50 million higher and the average interest rate was 1 percent higher than the figures used in the original estimate.

Therefore, 97 percent of the interest expense in excess of the expectation can be explained as follows (in thousands):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| $1,000,000 | X | 1% | = | $10,000 |
| 50,000 | X | 9% | = | 4,500 |
| Amount of difference explained | | | | $14,500 |

The auditor examined correspondence from lenders and loan statements to corroborate these explanations. The auditor was satisfied that these covered the significant factors and that it was not necessary to obtain an explanation for the remaining $.5 million, or 3 percent difference. The auditor concluded that interest expense is not misstated and no amounts are posted to the Summary of Uncorrected Misstatements.

Course of Action in the Event of Inadequate Explanations or Corroborating Evidence

1. If management’s explanation and corroborating evidence do not adequately explain the fluctuation sufficiently to provide either complete or partial assurance, the auditor should perform additional substantive procedures or treat the difference as a misstatement. These procedures may consist of

* increasing the effectiveness of the substantive analytical procedures by making the expectation more precise to obtain the desired assurance or
* performing tests of details and placing no reliance on the ineffective substantive analytical procedures.

1. The auditor should determine the effectiveness and efficiency of the above options. Deciding whether to perform additional substantive procedures is a matter of the auditor’s professional judgment. The auditor should perform additional procedures to provide adequate assurance that aggregate misstatements that exceed performance materiality have been identified.
2. To increase the persuasiveness or effectiveness of an analytical procedure, the auditor may make the expectation more precise by

* building a more sophisticated model by identifying more key factors and relationships,
* disaggregating the data (such as using monthly instead of annual data),[[8]](#footnote-8) or
* using more reliable data or obtaining greater confidence in the data’s reliability by corroborating the data to a greater extent.

Measuring the precision of the expectation and the impact of changing each of these factors on the procedure’s effectiveness is difficult. The auditor may consult with an expert in this field.

Performing Supplemental Analytical Procedures

1. If detail tests are used to test the account balance because adequate explanations cannot be obtained or corroborated, the auditor still should obtain an overall understanding of the current-year financial statements when applying overall analytical procedures at the financial statement level. See FAM 520.
2. Additionally, if analytical procedures originally performed as a substantive test do not provide the necessary assurance, the auditor may use those procedures to supplement an understanding of the account balances or transactions after performing detail tests.
3. When the auditor places no reliance on substantive analytical procedures, all assurance is provided by detail tests. In this situation, the auditor may use supplemental analytical procedures to increase the auditor’s understanding of the account balances and transactions after performing the detail tests. When using supplemental analytical procedures, the auditor uses professional judgment to determine which fluctuations to obtain explanations for and which explanations to corroborate.

480 – Perform Substantive Detail Tests

Population to Be Tested

1. In defining the population, the auditor should identify the whole set of items on which the auditor needs to reach a conclusion and from which the audit sample will be drawn. This includes describing the population; conducting data reliability tests to determine whether the population is complete and valid; determining the source document or the transaction documents to be tested; and defining the period covered by the test. The auditor should analyze the population for characteristics such as large or unusual balances, duplicate items, and abnormal balances. In designing detail tests, the assertion tested affects the choice of the population (an account balance or a portion of an account balance) from which items are selected. For example, the existence assertion deals with whether recorded assets or liabilities exist as of a given date and whether recorded transactions have occurred during a given period. To detail test the existence assertion, the auditor should test the recorded account balance by

* selecting items from those that compose the account balance and
* testing those items to evaluate whether including them in the account balance is proper.

For example, to test an expense account for existence, the auditor may select from a detailed general ledger individual expense amounts included in the balance and then examine invoices that support the expense amounts. It would be inappropriate to select invoices directly and then trace invoice amounts to inclusion in the general ledger balance.

1. For the existence assertion, the auditor should determine if the population agrees with or is reconciled to the recorded amount of the account balance being tested. The auditor should test reconciling items, if any. If this is not done, the auditor can conclude only on the population tested and not on the recorded population.
2. Conversely, the completeness assertion deals with whether all transactions and accounts that are expected to be in the financial statements are included. To detail test the completeness assertion, the auditor should select from an independent population of items that are expected to be recorded in the account. The auditor should (1) select items from a source that is likely to contain all the items that are expected to be recorded and (2) determine whether they are included in the recorded balance.

For example, to test completeness of recorded revenue, the auditor may select shipments from a shipping log (which is believed to be reasonably complete), trace them to recorded revenue amounts, and then test whether the summarization of those amounts was included in the general ledger revenue balance.

To test completeness of recorded accounts payable, the auditor may select payments made subsequent to year-end plus invoices on hand but not yet paid. The auditor may then trace transactions for which the receipt of goods or services occurred before year-end for inclusion in year-end accounts payable. For those transactions where the receipt occurred after year-end, the auditor should test for exclusion from accounts payable.

Selection Methods for Detail Tests

1. The auditor may apply detail tests to any of the following:

* all items composing the population,
* a nonstatistical selection of items, or
* an audit sample of items composing the population.

Flowchart 1 in FAM 495 D illustrates the process of deciding the selection method.

1. Detail testing of **all items composing the population** is generally most appropriate for populations consisting of a small number of large items. For example, several large accounts receivable or investments might compose an entire balance.
2. Detail testing of **a nonstatistical selection** is appropriate where the auditor knows enough about the population to identify a relatively small number of items of interest, usually because they are likely to be misstated or otherwise have a high risk of material misstatement.

While the dollar amount is frequently the characteristic that indicates that an item is of interest, other relevant characteristics might include an unusual nature (such as an item identified on an exception report); an association with certain entities (such as balances due from high-risk, financially troubled entities); or a relationship to a particular period or event (such as transactions immediately before and after the year-end).

The auditor should evaluate the effects of any misstatements found in the nonstatistical selection. However, unlike audit sampling, the results of procedures applied to items selected under nonstatistical selection apply only to the selected items. **It is incorrect for the auditor to** **project the results to the portion of the population that was not tested**. Accordingly, the auditor should apply appropriate substantive analytical procedures, other substantive procedures, or both to the remaining items, unless those items are immaterial in total or the auditor has already obtained enough assurance that there is a low risk of material misstatement in the untested population through other audit procedures.

1. Detail testing of **an audit sample** **of items composing the population** is necessary when the auditor cannot efficiently obtain sufficient assurance (based on the assessed risk of material misstatement and other substantive procedures, including analytical procedures) about the population from nonstatistical selections. AU-C 530 indicates that audit samples may be either statistical or nonstatistical.

The auditor should select items for the audit sample in such a way that the auditor can reasonably expect the sample to be representative of the relevant population and likely to provide the auditor with a reasonable basis for conclusions about the population (AU-C 530.08). The auditor should select the audit sample so that each item in the population has an opportunity to be selected. In random selection, each item has an equal chance of selection (see glossary for definition). For MUS, each monetary unit (dollar) has an equal chance of selection. For classical variables sampling, each item in a stratum has an equal chance of selection. Based on the results of procedures performed on the audit sample, the auditor should conclude on the entire population.

1. The auditor may use a nonstatistical selection for part of the population and an audit sample for the remainder of the population. For example, the auditor may make a nonstatistical selection of all inventory items with a book amount greater than $10 million, and select an audit sample for the remainder of the population. The auditor is able to conclude on the entire population by combining the results of the nonstatistical selection with the results of the audit sample.
2. The auditor should document (usually in audit procedures) whether a selection is intended to be an audit sample (representative of the population) or a nonstatistical selection (not representative of the population). If it is a nonstatistical selection, the auditor also should document the basis for concluding that enough work has been done to obtain sufficient assurance that the items not tested are free from aggregate material misstatement.

Audit Sampling

1. The following paragraphs provide an overview of audit sampling, primarily with respect to the existence and valuation assertions. Similar concepts and methods apply to the completeness assertion, except that the population to be tested differs, as discussed in FAM 480.01 through .03.
2. The auditor generally should consult with the audit sampling specialist when using sampling, including selection of audit sampling methods, selection of sample items, and evaluation of audit sample results.
3. In **statistical sampling**, the auditor uses probability theory to determine sample size, select the sample, and evaluate the results to reach a conclusion about the population. Statistical sampling permits the auditor to objectively determine sample size (based on subjective decisions about risk and materiality), objectively select the sample items, and objectively evaluate the results. Thus, by using statistical sampling, the auditor determines objectively whether enough work has been performed. When using statistical sampling, the auditor should determine a sample size sufficient to reduce sampling risk to an acceptably low level (AU‑C 530.07).

Because of these advantages, when an audit sample is necessary, the auditor generally should use statistical sampling. Software such as IDEA allows the auditor to quickly perform the calculations necessary for statistical sampling.

1. In **nonstatistical sampling**, the auditor considers statistical concepts but does not explicitly use them to determine sample size, select the sample,[[9]](#footnote-9) or evaluate results. Unlike statistical sampling, which allows the auditor to objectively evaluate sample results, the auditor using nonstatistical sampling will only be able to subjectively evaluate sample results, such as making a judgment about whether the potential misstatement in the population could be material.

The decision whether to use a statistical or nonstatistical sampling approach is a matter of professional judgment. AICPA guidance states that this choice is often a cost-benefit consideration;[[10]](#footnote-10) however, sample size is not a valid criterion to use in deciding between statistical and nonstatistical sampling approaches. An auditor who applies nonstatistical sampling exercises professional judgment to relate the same factors used in statistical sampling in determining the appropriate sample size. Ordinarily, this would result in a sample size comparable with the sample size resulting from an efficient and effectively designed statistical sample, considering the same sampling parameters (AU-C 530.A14).

1. In audit sampling, the auditor should select the sample from all the items that compose the population so that each item has an opportunity for selection. In statistical sampling, the auditor can determine the probability of selection. For example, the auditor may select sample items from a list of all accounts receivable balances that is reconciled to the related general ledger account balances. Selecting sample items from file drawers is not a valid selection method for any type of audit sampling, unless the auditor has determined that the file drawers contain all items composing the population.
2. For statistical samples, the auditor generally should select sample items using either random or MUS methods. The auditor may use computer software to select the statistical samples.
3. Sample size is a function of the size of the population, the auditor’s assessment of the risk of material misstatement, desired confidence level (based on the amount of substantive audit assurance that the auditor requires from detail tests, tolerable misstatement, expected misstatements in the population, and other factors discussed in FAM 230.13), and the sample selection method (AU-C 530.A13).
4. Once the auditor decides that a statistical sample is necessary, the choice of sampling method is a matter of professional judgment, in consultation with the audit sampling specialist as applicable, about the most efficient method for achieving the audit objectives. Statistical sampling methods available for substantive procedures are

* MUS (see FAM 480.21–.22);
* classical variables sampling (see FAM 480.27–.28 ); and
* classical probability proportional to size (PPS) sampling—evaluating a PPS sample using a classical variables sampling approach (see FAM 480.29–.30).

The auditor may use attribute sampling for tests of controls and for tests of compliance with significant provisions of applicable laws, regulations, contracts, and grant agreements. For example, the auditor may select an MUS sample of expenditure transactions for testing and include testing the sample for approvals, for entry into the general ledger, and for compliance with applicable provisions of the Prompt Payment Act. It should be noted that multipurpose tests may not be efficient if they are conducted during the first 2 years of a new audit, as the auditor may not be as aware of the operating effectiveness of the controls in place at an entity in a new audit and the rate of deviation may be higher than expected. In order to use MUS for a multipurpose test, there should be at least 45 unique transactions selected to meet the minimum control sample size requirements in FAM 450.

Classical variables sampling often results in smaller sample sizes. Multistage samples may reduce time and travel costs. The auditor generally should consult with the audit sampling specialist before using this sampling method.

1. Each of these statistical sampling methods yields a projected (likely) misstatement and an upper limit at the desired confidence level. In addition, classical PPS and classical variables sampling both yield a two-sided confidence interval (MUS yields an upper limit). The auditor should choose the appropriate method based on the test objectives and efficiency.
2. When deciding the statistical sampling method, the auditor should determine whether the monetary amounts of the individual items composing the population are available (for example, on a detail listing or in a computer file); the expected amount of misstatements; and the relative efficiency of each appropriate sampling method. Flowchart 2 in FAM 495 D summarizes the process for choosing the statistical sampling method once the auditor has decided that a statistical sample is necessary. The subsequent pages of the flowchart indicate the steps that the auditor generally should perform for each statistical sampling method. Example audit documentation for attribute sampling, MUS, and classical variables sampling can also be found in FAM 495 D.
3. If the dollar amounts of the individual items composing the population are known, the auditor should use MUS, classical PPS, or classical variables sampling. If dollar amounts of individual items are not known, see FAM 480.31–.33.

Statistical Sample Selection

MUS

1. MUS is a type of statistical sampling that the auditor generally should use when

* the monetary amounts of individual items in the population are known,
* the primary objective is to test for overstatement of the population (see below for testing a population related to the line item),
* the auditor expects that the total monetary amount of misstatement in the population is not large,[[11]](#footnote-11) and
* the amount of misstatement in an individual item cannot exceed the selected amount.[[12]](#footnote-12)

MUS works best in populations where the total misstatement is not large and where the objective is to test for overstatement of a population. When the objective is to test for understatement of a line item, the auditor often is able to define a related population to test for overstatement. For example, to test for understatement of accounts payable, the auditor may select an MUS sample of subsequent disbursements. See also FAM 480.31–.33.

1. When the total misstatement in the population is not large, MUS will yield the smallest sample size for a given population, tolerable misstatement, and desired confidence level when all statistical sampling methods are considered. If the auditor expects that the population contains a large amount of misstatement, the auditor generally should use classical variables sampling (see FAM 480.27–.28).

Computation of MUS Size

1. When the auditor uses IDEA to calculate MUS size, the inputs are materiality, tolerable error, expected error, expected total (dollar) amount of misstatements in the population, confidence level, and the (dollar) amount of the population.
2. The auditor should perform audit procedures, appropriate to the purpose, on each item selected (AU-C 530.09). If the audit procedure is not applicable to the selected item, the auditor should perform the procedure on a replacement item (AU-C 530.10).
3. If the auditor is unable to apply the designed audit procedures, or suitable alternative procedures, to a selected item, the auditor should treat that item as a deviation from the prescribed control (in the case of tests of controls; see FAM 450) or a misstatement (in the case of tests of details) (AU-C 530.11). If this is the case, see further explanation at FAM 450.17.
4. If additional sample items are not selected during the initial sample and it is necessary to select additional and or replacement items, the auditor generally should consult with the audit sampling specialist to determine how to select the additional sample items. Selection of these additional items may be more complex and less efficient than if they were chosen during the initial sample.

Classical Variables Sampling

1. Classical variables sampling is a type of statistical sampling that may be used when the auditor expects that one or more conditions exist in the population, such as

* the dollar amount of misstatement in the population is large (see footnote 3),
* individual misstatements may exceed the selected amount of sampling units,
* significant understatements cannot be identified using other tests,
* there are no book amounts for each sampling unit, or
* the auditor cannot add the dollar amounts in the population (see flowchart 2 in FAM 495 D).

1. Classical variables sampling is useful because it frequently results in smaller sample sizes in higher misstatement situations than those that would be obtained using MUS. Because applying this method is somewhat complex, the auditor generally should consult with the audit sampling specialist before using it. Both this method and classical PPS sampling discussed below require knowledge of the population to determine sample size. In many audits, the auditor learns about the population over several audits and may use this knowledge to refine the sampling methodologies to improve efficiency.

Classical PPS Sampling

1. Classical PPS sampling is a type of statistical sampling that the auditor generally should use when testing for overstatement of the defined population and expecting a large misstatement rate. Since there is no exact way to determine sample size, the auditor uses MUS to calculate sample size (proportional to size). However, since classical PPS sampling is used when there are large misstatement rates, the auditor should use a conservative (high) estimate of the expected misstatement to avoid needing to subsequently expand the sample size to obtain a sufficient sample size.
2. Classical PPS sampling yields a valid measure of projected misstatement and precision and is easier to design and evaluate than classical variables sampling. Thus, in higher misstatement situations, the auditor may choose to use classical PPS sampling if there are no reasons for using classical variables sampling other than an expected high misstatement rate.

Sampling When Dollar Amounts Are Not Known

1. The auditor cannot use MUS if the dollar amounts of individual items in the population are not known. The auditor may use classical variables sampling, but this method has some difficulties. There is no way to accurately calculate the sample size without the individual dollar amounts, and the method is inefficient unless the auditor finds a large misstatement rate. Auditors usually encounter lack of individual dollar amounts when testing the completeness assertion and selecting from a population independent of the population being tested, such as a shipment from a shipping log (see FAM 480.01–.03). One approach may be for the auditor to select a random or systematic sample of the individual items. For example, the auditor may randomly select items from a shipping log to test the completeness/cutoff assertion for revenue and accounts receivable that shipments have been billed in the proper period.
2. For this type of test, the sample size may be approximated from the total (dollar) amount of either the population from which the auditor is sampling (the total dollars of the shipping log if the log has amounts), or the amount of the population that the auditor is testing (the total recorded revenue). Because this method is less efficient than MUS, the auditor generally should use a preliminary estimate of sample size that exceeds the sample size that would result from using MUS, for example, at least a 25 percent increase in sample size.[[13]](#footnote-13)
3. The auditor generally should consult with the audit sampling specialist to determine whether to use classical variables sampling and to perform the evaluation. In using attribute sampling for substantive tests, the auditor generally should use the upper limit of the misstatement rate to make a conservative estimate of the dollar amount of misstatement in the population. If the upper limit is less than materiality, the auditor has evidence that the population is free of material misstatement.

Evaluation of Sample Results

1. Evaluation of sampling results, including sampling risk (AU‑C 530.14), should involve the following:

* Projecting the results of the statistical sample to the population (AU-C 530.13) (for nonstatistical samples, making a judgment about the potential effect of any deviations or misstatements in the population).
* Calculating either (1) the upper limit on misstatement in the population or (2) an interval estimate of misstatement or of the population audited value, at the desired confidence level (for nonstatistical samples, considering the risk of further misstatement).
* Determining any qualitative aspects of the deviations/misstatements.
* Bringing deviations/misstatements to management’s attention.
* Asking management to correct factual misstatements.
* Investigating the nature and cause of deviations/misstatements and evaluating their possible effect on the purpose of the audit procedure and on other areas of the audit (AU-C 530.12).
* Concluding as to whether the population is free from material misstatement, after management’s adjustments, if any.
* Evaluating the effect of misstatements on the financial statements taken as a whole.

The auditor usually completes the first two steps above with software such as IDEA. The auditor generally should perform the evaluation in consultation with the audit sampling specialist.

1. The effects of any misstatements detected in a statistical sample are projected to the population. The auditor should project all misstatements unless **highly persuasive evidence** is obtained that a misstatement is not representative of the entire population. If the evidence is highly persuasive that a misstatement is not representative of the population, the auditor should

* perform procedures to test that the same type of misstatement does not exist elsewhere in the population;
* evaluate the misstatement that is not representative;
* evaluate the statistical sample, excluding the misstatement that is not representative; and
* obtain the approval of the audit director that the evidence is highly persuasive.

The projected misstatement amount is included in the Summary of Uncorrected Misstatements, the evaluation of which is discussed in FAM 540.

1. At the conclusion of the test, the auditor also should determine whether the assessment of risk of material misstatement remains appropriate, particularly in light of any misstatements identified. If the preliminary risk of material misstatement assessment was not appropriate, the auditor should consult with the reviewer to determine whether the extent of substantive procedures is adequate.
2. When understated amounts are detected in any statistical sample designed primarily to test the existence assertion (i.e., designed to test primarily for overstatement), the auditor generally should consult with the audit sampling specialist in evaluating the sample results.

Calculating the Projected Misstatement for MUS

1. If the auditor does not use software to evaluate statistical sample results, the auditor should calculate projected misstatement as follows. If the sample item has a recorded amount that equals or exceeds the sampling interval, the projected misstatement is the actual amount of the misstatement identified for that item. For any other misstatement detected, the projected misstatement is computed by

* dividing the amount of misstatement by the recorded amount of the sample item and
* multiplying the result by the amount of the sampling interval.

The sum of all projected misstatements represents the aggregate projected misstatement for the statistical sample. For example, assume the following two misstatements are detected in a statistical sample for which the sampling interval is $300,000: (1) a $50,000 misstatement detected in a $500,000 item (which exceeds the amount of the sampling interval) results in a projected misstatement of $50,000 and (2) a $100 misstatement in a $1,000 sample item represents a 10 percent misstatement, which results in a projected misstatement of $30,000 (10 percent of the $300,000 sampling interval). In this example, the aggregate projected misstatement is $80,000.

Evaluating a MUS as a Classical PPS Sample

1. If a MUS results in a large number of misstatements, it is likely that the evaluation based on using the calculating method illustrated above would indicate that the upper limit of misstatement in the population exceeds materiality (IDEA indicates the number of misstatements that would yield acceptable results). However, if there are a large number of misstatements,[[14]](#footnote-14) the auditor, in consultation with the audit sampling specialist, generally should evaluate the sample using classical PPS sampling. This evaluation is complex and cannot be done directly using IDEA.

Evaluating the Results of a Classical Variables Sample

1. The auditor generally should consult with the audit sampling specialist in evaluating the results of a classical variables sample.

Evaluating the Results of Other Samples

1. When the auditor detects misstatements in an audit sample for which guidance on evaluation is not described above, the auditor generally should consult with the audit sampling specialist.

Effects of Misstatements on the Financial Statements

1. The auditor should evaluate the quantitative and qualitative effects of all misstatements detected in the audit in relation to the financial statements taken as a whole. FAM 540 and 545 provide guidance on this evaluation.

490 – Documentation

1. The auditor should include in the audit documentation the (a) overall responses to address the assessed risks of material misstatement at the financial statement level and the nature, extent, and timing of further audit procedures performed; (b) the linkage of those procedures with the assessed risks at the relevant assertion level; and (c) the results of the audit procedures, including the conclusions when such conclusions are not otherwise clear (AU-C 330.30).[[15]](#footnote-15) The auditor should also specifically identify the procedures used to obtain substantive audit assurance for an account balance, for example, when the auditor relies on detail tests for complete substantive audit assurance and performs supplemental analytical procedures to increase the auditor’s understanding of the account balances and transactions. The auditor may document the procedures performed, results, and conclusions in summary memos by cycle area.
2. In order to focus on key matters and identify significant exceptions, the auditor generally should document in the planning audit documentation the audit objectives, procedures to be performed, possible exceptions, and why they may be important.
3. The auditor also should document, usually in the applicable audit plan with the audit procedures, whether a selection is intended to be a (1) statistical sample (representative of, and statistically projectable to, the population), (2) nonstatistical sample (representative of, but not statistically projectable to, the population), or (3) nonstatistical selection (not representative of, and not projectable to, the population). If it is a nonstatistical selection, the auditor should document the assessment of the risk of material misstatement for the items not tested as part of the selection and the basis for concluding that enough work has been done to obtain sufficient assurance that the items not tested are free from aggregate material misstatement.
4. As audit work is performed, the auditor may become aware of possible material weaknesses, other significant deficiencies, other control deficiencies, identified or suspected noncompliance, or other matters. The auditor should document and communicate these issues, as described in FAM 580.55 through .83.
5. The auditor should document the elements included in FAM 495 D, which include the items below. (GAO auditors generally should use FAM 495 D and provide it to the auditing sampling specialist).
6. For tests involving audit sampling, the auditor should document the following:

* the sampling method used;
* the sample size and the method of determining it;
* how the sample was selected;
* a list of items tested;
* the audit procedures performed; and
* the results of tests, including evaluations of sample results, and conclusions.

1. For substantive analytical procedures, the auditor should document the following:

* the model used to develop the expectation and the basis for the model, including the expectation referred to in FAM 475.04 and the factors considered in its development when that expectation or those factors are not otherwise readily determinable from the audit documentation (AU‑C 520.08a);
* the data used and the data sources;
* the auditor’s assessment of the reliability of the data used and procedures performed to establish or increase the amount of reliability, if applicable;
* the amount of the limit and the criteria for establishing the limit;
* results of the comparison referred to in FAM 475.04 of the recorded amounts, or ratios developed from recorded amounts, with the expectations (AU-C 520.08b), including management’s explanations for significant fluctuations, sources of these explanations, and corroborating evidence obtained;
* any additional auditing procedures performed relating to the investigation of fluctuations or relationships that are inconsistent with other relevant information or that differ from expected values by a significant amount and the results of such additional procedures (AU-C 520.08c); and
* conclusions regarding findings, including treatment of any misstatements detected and assessment of any other effects of these misstatements.

1. The auditor should document interim testing procedures (see FAM 495 C for documentation guidance).
2. The auditor should document individual and total misstatements on the Summary of Uncorrected Misstatements. See FAM 540 and FAM 595 C.
3. For audit procedures related to the inspection of significant contracts and grant agreements, the auditor should include abstracts or copies of those contracts and grant agreements in the audit documentation (AU-C 230.10).

Determining whether an inspected contract or grant agreement is significant is a matter of auditor judgment. In making this determination, the auditor may find it necessary to consult with OGC to gain a better understanding of the contract or grant agreement.

If a contract or grant agreement is deemed to be significant, the auditor should include information about the contract or grant agreement in the audit documentation. At a minimum, the audit documentation should include abstracts or copies of significant contracts and grant agreements examined if they are needed to allow an experienced auditor to understand the work performed and conclusions reached. The following considerations may help guide the auditor in determining whether a contract or grant agreement is significant and whether to obtain and maintain an abstract or copy in the audit documentation.

* Risk – Matters arising from contracts or grant agreements that an auditor considers to be a significant risk. Factors in making that determination include complexity, uniqueness, congressional or public interest, and whether it is outside the normal course of business.
* Materiality – Individual or classes of contracts or grant agreements that are individually or collectively material, considering both quantitative and qualitative materiality. If there is a class of similar contracts or grant agreements, the auditor may determine that only examples of such contracts or grant agreements or abstracts summarizing the class are necessary to include in the audit documentation. Factors in making this determination include transactions and balances recorded under a contract or grant agreement that are material to the financial statements, and contracts or grant agreements that are significant or fundamental to the operations of the entity.
* Disclosure – Matters or transactions arising from contracts or grant agreements that could be disclosed in the financial statements, notes, required supplementary information, and other information.
* Internal control over financial reporting – Internal controls over financial reporting that the auditor has determined are key, especially those performed by service organizations.
* Auditor’s report – Issues or transactions arising from contracts and grant agreements that the auditor has determined to be significant and included in the auditor’s report as emphasis-of-matters or other-matters.

1. For accounting estimates, the auditor should document the following (AU‑C 540.22):

* with significant risk, the basis for the auditor’s conclusions about the reasonableness of accounting estimates and their disclosure and
* indicators of possible management bias, if any.

495 A – Determine Whether to Perform Substantive Analytical Procedures

1. When determining whether performing substantive analytical procedures will be effective and efficient as a substantive test, the auditor should evaluate the

* nature of the account balance, the audit objective (including the assertions being tested), and the assessed risk of material misstatement (FAM 495 A.02–.04);
* expected availability and reliability of explanations for fluctuations and related corroborating evidence (FAM 495 A.05);
* plausibility and predictability of the relationship (FAM 495 A.06–.13);
* availability and reliability of data (FAM 495 A.14–.22); and
* preciseness of the expectation (FAM 495 A.23–.25).

This FAM section provides additional guidance to the auditor in these areas.

Nature of the Account Balance, the Audit Objective, and the Assessed Risk of Material Misstatement

1. Analytical procedures are usually more effective for testing accounts that accumulate transactions for the period, such as statement of net cost accounts, than for testing balance sheet accounts. This is because balance sheet amounts are more difficult to predict as they are as of a specific point in time. Additionally, net cost statement amounts generally have relationships with other data, such as cost of sales as a percentage of sales, interest expense as a function of the debt balance and interest rates, or sales revenue as a function of the number of units shipped and the average sales price. Analytical procedures are usually less effective for testing amounts that are subject to management discretion or are unpredictable, such as repairs or miscellaneous expenses.
2. The auditor should use the audit objective, including relevant assertions, and the assessed risk of material misstatement to determine whether substantive analytical procedures will be effective. The auditor can obtain three levels of substantive assurance from analytical procedures—complete, partial, or none. The effectiveness and the amount of assurance that an individual procedure provides are matters of the auditor’s professional judgment and are difficult to measure.
3. When the risk of material misstatement is high, the auditor will rarely be able to place complete reliance on analytical procedures for substantive assurance, particularly for balance sheet accounts. Therefore, in these cases, the auditor should design analytical procedures that are extremely effective and persuasive, if they are to serve as the sole source of audit evidence for achieving the audit objective.

Explanations for Fluctuations and Corroborating Evidence

1. Explanations for fluctuations and related, reliable corroborating evidence may not be readily available. This evidence is essential when the auditor uses analytical procedures as a substantive test. The auditor could consider the relative ease of obtaining explanations for significant differences and relevant, reliable corroborating evidence when determining whether analytical procedures will be effective.

Plausibility and Predictability of the Relationship

1. Relationships between the amount being tested (the recorded amount) and the other data are an essential component of substantive analytical procedures. The auditor should identify relationships that are good indicators of the account balance, that is, the relationship between the recorded amount and the other data is plausible and predictable.

Plausibility

1. If one set of data provides a reasonable basis for predicting another set of data, the relationship between the two sets of data is plausible. As the plausibility of the relationship increases, so does the effectiveness of analytical procedures as a substantive test.
2. For example, there is a plausible relationship between payroll expense, the average number of employees, and the average pay rate. This relationship generally is effective for the auditor to use in developing an expectation for payroll expense of salaried employees. Alternatively, there is not usually a plausible relationship between revenue and interest expense. Therefore, this relationship would not be used for developing an expectation.

Predictability

1. The more predictable the relationship is, the more effective the substantive analytical procedure will be. Relationships are more predictable in a stable environment. As relationships become more complex because of increases in the number and type of contributing factors, related amounts become more difficult to effectively and efficiently predict.
2. For example, payroll expense generally is very predictable if there is little employee turnover during the period, if all employees receive the same percentage raise at the same time, and if all employees are salaried. Payroll expense becomes more difficult to predict if any of these factors changes, such as high turnover resulting in a different mix of employee pay, a wide range of raises awarded at different times, or a mix of hourly and salaried employees. Therefore, to effectively estimate payroll expense, the auditor may need to use a more complex relationship that considers these factors.
3. The relationships may be between the recorded amount and either prior-year or current-year data, using financial or nonfinancial data, including underlying business factors. For example, the auditor may determine an expectation for (1) current-year interest expense using current-year **audited**, long-term debt amounts and interest rate information or (2) estimating budgetary gross outlays based on known relationships with related audited proprietary accounts, such as operating expenses, payables, and capital acquisitions, and comparing this amount to the balance reported on the statement of budgetary resources. **When using current-year relationships, the auditor should test the data used to develop the expectation by a method other than a substantive analytical procedure that uses a relationship with the recorded amount.**
4. The auditor should develop a rationale for using prior-year amounts as the only basis for the expectation. The auditor should document why, in the auditor’s professional judgment, the prior-year amount—and any adjustments to that amount—has a plausible and predictable relationship with the current-year recorded amount. The auditor could consider testing any adjustments to the prior amount, such as for the effects of inflation. Additionally, the auditor should determine whether the prior-year amount is reliable. The easiest way to determine this is if the prior-year amount is audited.
5. For an example of prior-year relationship, assume that the payroll raises for the current year were authorized at 5 percent and that the number and salary mix of employees have remained relatively stable. In this example, the auditor may reasonably expect current-year payroll expense to be 5 percent higher than the prior year’s payroll expense. However, the auditor would need to test the reliability of the percentage pay increase and the assumptions regarding the number and mix of employees.

Data Considerations

Availability of Data

1. Data needed to perform analytical procedures may not be readily available. The auditor generally should determine when data will be available and the relative ease of obtaining relevant, reliable data when determining whether analytical procedures will be efficient and effective.

Reliability of Data

1. The more reliable data are, the more effective analytical procedures will be as a substantive test. In assessing the reliability of data, which is a matter of the auditor’s professional judgment, the auditor should evaluate

* the source of the data, including whether the data are audited or unaudited;
* conditions under which the data were developed and gathered, including related internal controls; and
* other knowledge the auditor may have about the data.

Sources of Data

1. Data obtained from an independent source outside the entity are generally more reliable than data obtained from inside the entity. However, the auditor should determine if the outside information is comparable to the item being tested. This issue of comparability is important if the auditor is using industry statistics.
2. Data obtained from entity sources are more reliable if the sources are independent of the accounting function and if the data are not subject to manipulation by personnel in the accounting function. If multiple data sources are used, the auditor should determine the reliability of all sources used.

Audited versus Unaudited Data

1. The auditor should determine whether the data are audited or unaudited because audited data are more reliable than unaudited data. (See FAM 600 on using the work of others.)
2. Unaudited data are not reliable unless the auditor performs procedures to establish their reliability. These procedures could consist of either evaluation and tests of controls over data production or tests of the data. The extent of such procedures is a matter of professional judgment and should be documented. For example, interest rates from an entity’s loan register may be used to estimate interest income. The reliability of this information may be established by including the interest rate on loan confirmations that are sent to the borrowers or by reviewing original loan documents.

Conditions under Which the Data Were Gathered

1. Another consideration for internal data is whether the data were developed under a reliable system with adequate financial reporting or operations controls. The auditor may test operations controls to assess the reliability of the data used for substantive analytical procedures. The extent of this testing is a matter of the auditor’s professional judgment.
2. If the system used to develop internal data is computerized rather than manual, the auditor should perform additional procedures before relying on the data. The auditor should test either (1) the general controls and the specific application controls over the information system that generated the report or (2) the data in the report.
3. An auditor may test operations controls when using entity-prepared statistics for a substantive analytical procedure. For example, the auditor may use Air Force statistics to test the reasonableness of its Airlift Services’ aircraft operating costs. The auditor may compare the per hour fuel and maintenance costs for Airlift Services’ cargo and passenger aircraft with the “block hour” costs that major airlines incur for similar aircraft, as published in *Aviation Week* and *Space Technology*. The auditor would first determine if the industry statistics are comparable, for example, if the statistics are for the same or similar types of aircraft and if the types of items included in maintenance costs are similar. The auditor may then identify and test the internal controls over the production of these operating statistics.

Preciseness of the Expectation

1. The auditor should develop an expectation of the account balance that is precise enough to provide the desired substantive assurance. When determining how precise the expectation should be, the auditor should determine the proper balance between effectiveness and efficiency. Any work to make the expectation more precise than the desired level of assurance is unnecessary.
2. If the audit objective cannot be achieved with the original expectation, the auditor may be able to perform additional procedures to make the expectation more precise. The preciseness of the expectation and changes in this preciseness are difficult to measure in quantifiable terms, unless the auditor uses regression analysis in performing the analytical procedures. The auditor generally should consult with the audit sampling specialist before using regression analysis.
3. Factors that influence the expectation’s preciseness follow:

* **The identification and use of key factors when building the model based on the relationships the auditor identifies:** The expectation generally becomes more precise as additional key factors are identified.
* **The reliability of the data used to develop the expectation:** The expectation becomes more precise as the reliability of the data increases.
* **The degree of disaggregation of the data:** The expectation becomes more precise as the disaggregation of the data increases.

495 B – Example Procedures for Tests of Budget Information

1. This section includes examples of procedures that auditors may perform in testing budget information for the statement of budgetary resources and reconciliation of net cost of operations to budget.
2. In addition, if budget controls are ineffective and quantitative provisions of budget-related laws and regulations are significant, the auditor generally should perform audit procedures sufficient to detect material misstatements in the types of budget information listed in FAM 460.04. Tolerable misstatement for use in determining sample sizes is discussed in FAM 460.03.

Testing Obligations and Expended Authority Transactions

1. The following are examples of procedures that the auditor may use to test obligation[[16]](#footnote-16) and expended authority transactions for these misstatements.

**Validity, accuracy/valuation, and classification assertions**:

1. Select obligations recorded as of the end of the audit period and expended authority transactions recorded during the audit period.
2. Determine if each selected item is a valid obligation or expended authority transaction based on the criteria set forth in FAM 395 F.
3. Determine if each selected item is recorded at the accurate amount (value).
4. Determine if each selected item is properly classified in the appropriation or fund account (also by program and by object, if applicable), including the proper appropriation year.
5. Test upward and downward adjustments of obligations. Determine whether selected adjustments are supported by formal decisions and any necessary documentation that has been fully executed (e.g., SF-30 for contract amendments). If any of these adjustments relate to closed accounts, determine whether the adjustments comply with the requirements for closing appropriation accounts under 31 U.S.C. §§ 1551-1558. See FAM 395 E for guidance on the budget execution process.

**Completeness and cutoff assertions**:

1. Select obligations and expended authority transactions recorded during the period between the balance sheet date and a date near the audit completion date.
2. Examine open purchase orders, unpaid invoices, and contracts as of a date near the audit completion date.
3. Select items representing payments by the Department of the Treasury or cash disbursements by the entity during the audit period. Substantive detail test selections of expenses and additions to inventory, property, and prepaid accounts may be used for this purpose if the populations from which they are selected are complete.
4. For each selection, determine whether the obligation or expended authority transaction is recorded in the proper period. If transactions are not recorded, or are recorded in the incorrect period, determine the effects of this misstatement on budget amounts, the evaluation of budget controls, and the risk of material misstatement.
5. If the selected obligation or expended authority transaction relates to the audit period and is recorded in that period, determine if it is recorded at the proper amount and properly classified in the appropriation or fund account (also by program and by object, if applicable), including the proper appropriation year.

**Summarization assertion:**

1. Test the footing of the detail of the obligation account balance recorded as of the end of the audit period and expended authority accounts recorded during the audit period.
2. Reconcile the total of these details to the recorded totals for obligation and expended authority accounts as of the end of the audit period. Audit software is often an effective tool for footing the transactions recorded in the accounts and for selecting items for testing.
3. The auditor generally should coordinate the audit procedures discussed above for testing expended authority transactions with the audit of other financial statement amounts. For example, if appropriate, the auditor may coordinate tests of accounts payable for completeness with the selection of subsequent obligations and expended authority transactions described above.

Testing Outlay Transactions

1. The following are examples of procedures that the auditor may use to test outlay transactions. The auditor generally should coordinate these audit procedures with the audit of the other financial statement amounts, chiefly cash disbursements.

**Validity and classification assertions:**

* Select outlays recorded during the audit period. Determine if an invoice and a receiving report support each selected outlay. Determine the obligation that was liquidated by the outlay.
* Examine the support for the obligation and determine if the invoice billed for goods or services is related to or properly “matches” the obligation and, in turn, the appropriation.
* Obtain the accounting data for the matched obligation, including appropriation and year. Match these data to the type of services paid for by the selected outlay. Determine if the related appropriation authorizes payment for the services billed and paid.

495 C – Guidance for Interim Testing

Misstatements in Interim Balances

1. If the auditor detects unexpected misstatements when assessing the risks of material misstatement at an interim date, the auditor should evaluate whether the related assessment of risk and the planned nature, timing, or extent of substantive procedures covering the remaining period need to be modified (AU‑C 330.24). (See FAM 295 D for a discussion of factors in deciding whether to use interim substantive testing.) The auditor should determine the effects of misstatements by evaluating relevant factors, including

* the nature and cause of the misstatement;
* the estimated effects on the overall line item/account balance;
* whether the entity has subsequently corrected the misstatement; and
* the impact of the misstatement on other parts of the audit.

1. The auditor should discuss financial statement misstatements with entity management. Based on the nature and cause of the misstatements detected, the auditor should determine, and obtain supporting evidence on, whether the misstatements are likely to occur in the remainder of the line items/account balances at the interim testing date and at the year’s end. (See FAM 480.35 for a discussion of the need to project all misstatements unless evidence is highly persuasive that a misstatement is isolated and the audit director approves.[[17]](#footnote-17))

The auditor should request that entity management correct such misstatements in the population. Based on the following guidance, the auditor should use professional judgment to determine the extent to which interim testing can be relied upon, in conjunction with substantive procedures in the roll-forward period, to provide sufficient appropriate evidence on the year-end line item/account balance under the following circumstances:

1. If the misstatements are not material when projected to the entire population (projected misstatements plus an allowance for further misstatements is less than tolerable misstatement) and are expected to be representative of the misstatements of the year-end balance, the auditor may rely upon the results of the interim testing.
2. If the auditor has obtained highly persuasive evidence that the misstatements are isolated (generally by nature, cause, or extent), the auditor may be able to rely upon unaffected parts of the interim testing and apply procedures at year-end to test only those financial statement assertions associated with the misstatements.

For example, in interim testing of inventory, the auditor might determine that the misstatements concern only the valuation of inventory. Accordingly, the auditor may rely upon other parts of the interim testing, such as those for the accuracy of the physical count and cutoff, and perform detail valuation testing and related procedures at year-end.

1. If the misstatements are material or pervasive, the auditor should determine (1) whether to place any reliance on the interim testing, (2) the effect on the risk of material misstatement, and (3) the nature and extent of substantive procedures to be performed on the line item/account balance as of the balance sheet date.
2. For any misstatements found during interim testing, the auditor uses professional judgment to evaluate, in a manner appropriate for the circumstances, the effects on the year-end balance.

Testing the Roll-Forward Period

1. Because the auditor reports on the financial statements as of year-end, not the interim test date, the auditor should perform further substantive procedures or substantive procedures combined with tests of controls (if the auditor concludes that substantive procedures alone would not be sufficient to cover the remaining period). The auditor should perform procedures to provide the auditor with a reasonable basis for extending the audit conclusions from the interim date to year-end. The auditor should perform substantive procedures of the roll-forward period activity to the year-end balance.

For example, after interim testing of the loans receivable balance as of June 30, the auditor may examine supporting documents for selected debits and credits to the balance during the roll-forward period of July 1 through September 30. The auditor may also apply analytical procedures to compare the amount of roll-forward activity, on a month-by-month basis, with expectations based on results for preceding months or similar periods of preceding years.

1. The auditor should determine the nature and extent of substantive procedures based on the assessment of risk of material misstatement and tolerable misstatement. In some instances, the auditor may determine that a specific risk of material misstatement warrants additional or different substantive procedures at year-end, such as cutoff tests. If risk of material misstatement is moderate or low, the auditor generally should determine whether the internal controls as of the interim testing date were in place and were operating effectively during the roll-forward period. The auditor may refer to the results of tests of financial reporting controls, which cover the entire year under audit for significant systems.
2. When the auditor reports on the effectiveness of controls as of a specific date and obtains evidence about the operating effectiveness of controls at an interim date, the auditor should determine what additional evidence concerning the operation of the controls for the remaining period is necessary (AU-C 940.40). The additional evidence necessary to update the results of testing from an interim date to the entity’s period-end depends on the following factors:

* The specific control tested prior to the as-of date, including the risks associated with the control, the nature of the control, and the results of those tests.
* The sufficiency of the evidence of operating effectiveness obtained at an interim date.
* The length of the remaining period.
* The possibility that there have been any significant changes in internal control subsequent to the interim date.

Documentation

1. The auditor should document

* line items/accounts and assertions to which interim testing is applied;
* the basis for using interim testing;
* audit procedures used to test interim balances and the roll-forward period (including tests of controls, findings, and conclusions);
* effects of any misstatements found during interim testing and during roll-forward testing; and
* conclusions on the line items as of and for the year.

495 D – Selection Methods

Selection Method Flowcharts and Example Audit Documentation

1. This section contains selection method flowcharts (FAM 495 D-2–D-6) and example audit documentation (FAM 495 D-7–D-19).
2. Flowchart 1 (FAM 495 D-2) assists the auditor in determining the selection method for substantive tests. Selection methods are either (1) statistical sampling (representative of, and statistically projectable to, the population), (2) nonstatistical sampling (representative of, but not statistically projectable to, the population), or (3) nonstatistical selection (not representative of, and not statistically projectable to, the population). If the auditor decides to use statistical sampling or nonstatistical sampling, the auditor generally should consult with the audit sampling specialist, including for selection of sampling methods, selection of sample items, and evaluation of sampling results.
3. Flowchart 2 (FAM 495 D-3) helps the auditor determine the type of statistical sampling to use. The choices are (1) attribute sampling, (2) MUS, and (3) classical variables sampling.

When testing for overstatement in the defined population and expecting a large misstatement rate, the auditor may use classical PPS sampling. See FAM 480.29 through .30 and FAM 480.39 for further information.

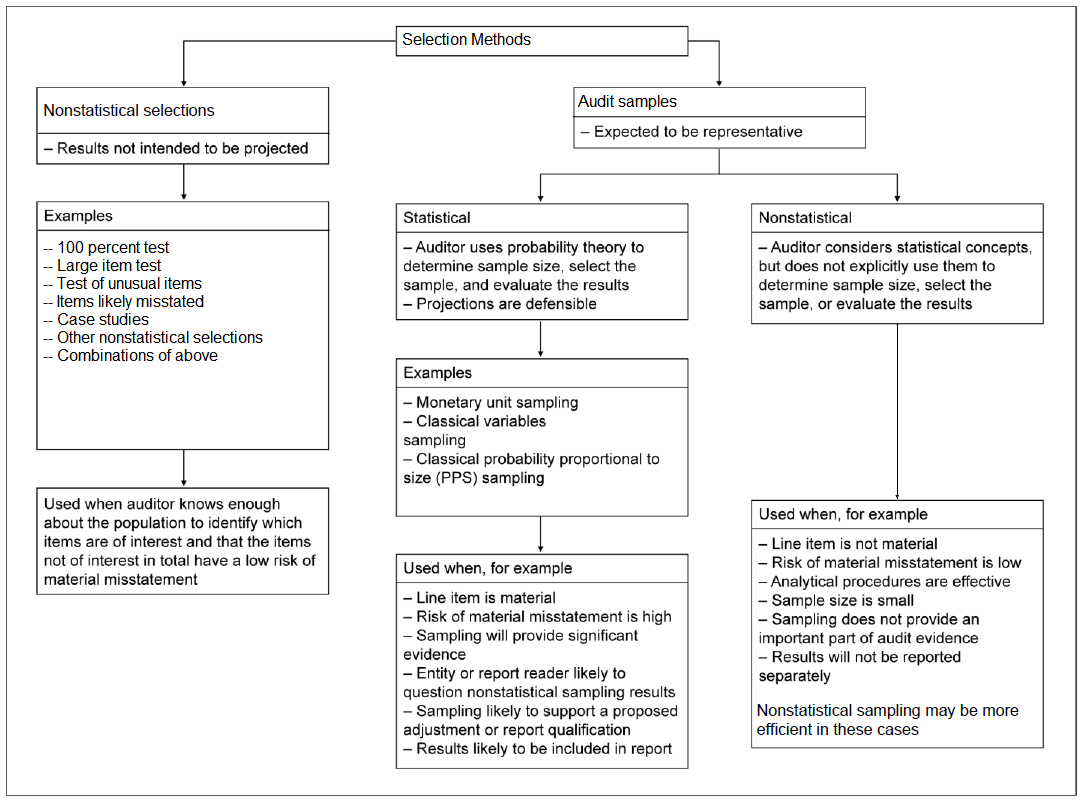
1. The remaining flowcharts are to assist the auditor in performing

* attribute sampling at FAM 495 D-4 (flowchart 3),
* MUS at FAM 495 D-5 (flowchart 4), and
* classical variables sampling at FAM 495 D-6 (flowchart 5).

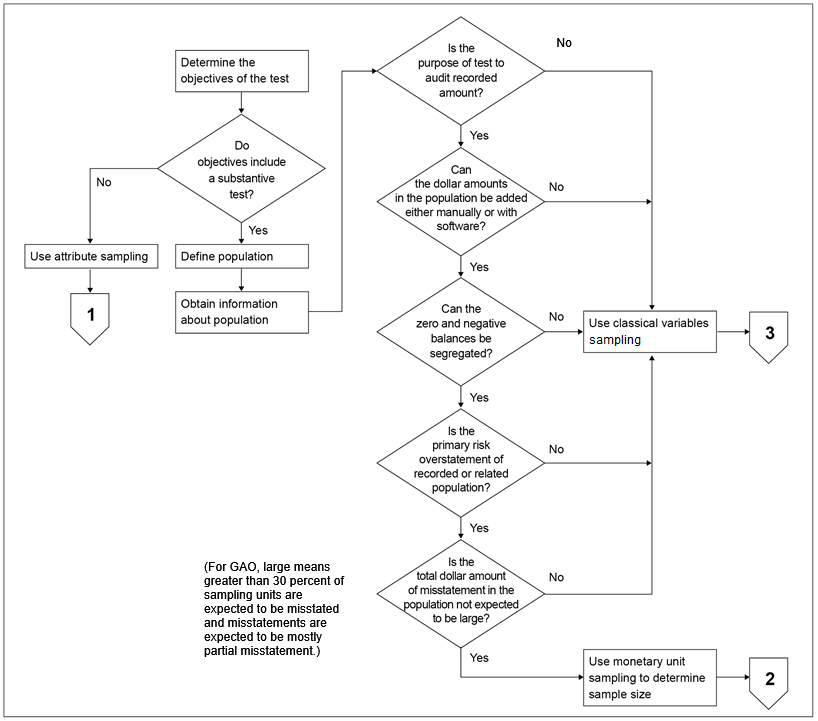
1. Examples of audit documentation for sampling are provided for

* attribute sampling at FAM 495 D-7 through D-10,
* MUS at FAM 495 D-11 through D-15, and
* classical variables sampling at FAM 495 D-16 through D-19.

Flowchart 1: Determining the Selection Method for Substantive Tests



Flowchart 2: Determining Which Type of Statistical Sampling to Use



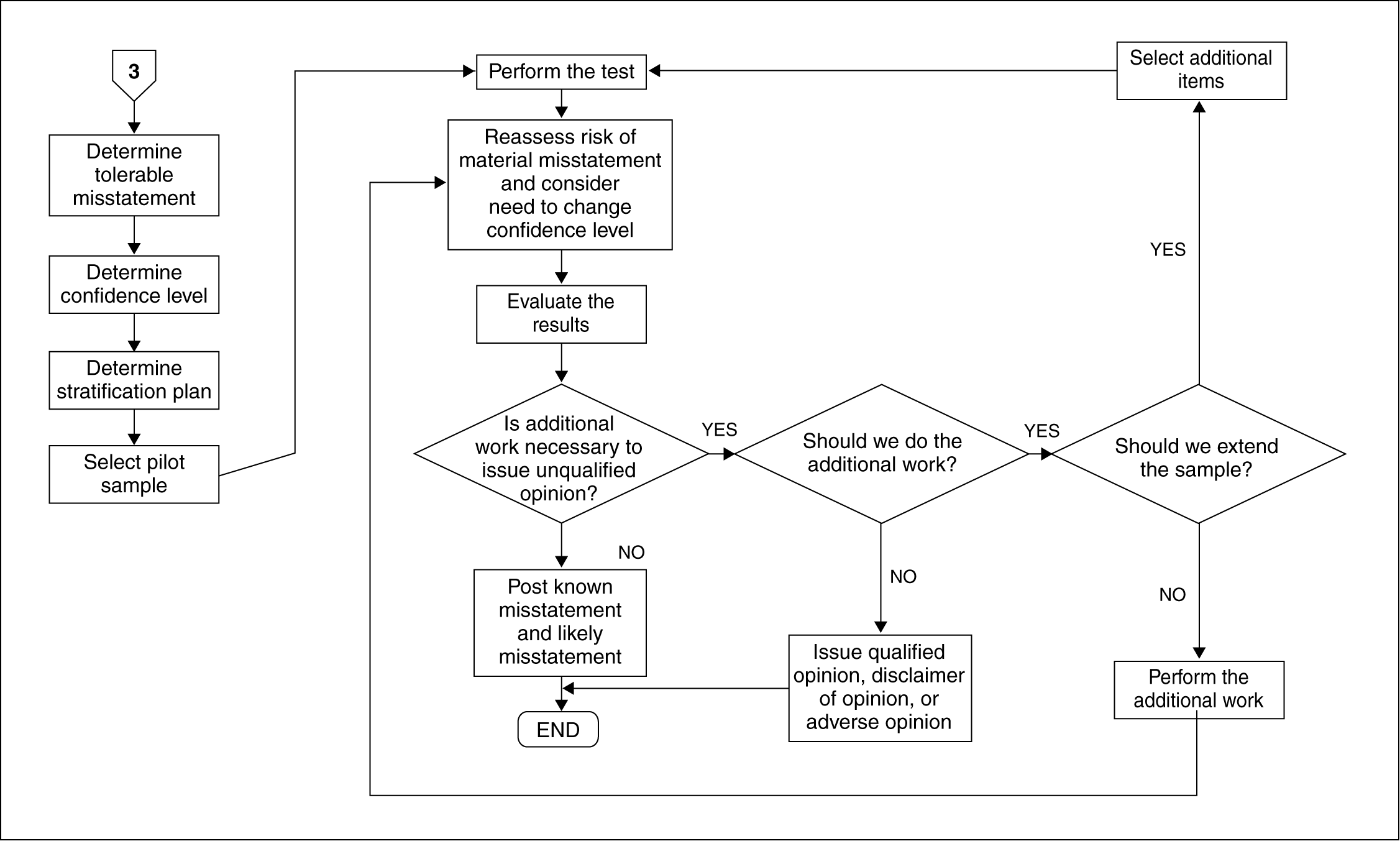
Flowchart 3: Testing Using Attribute Sampling

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Flowchart 4: Testing Using Monetary Unit Sampling

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Flowchart 5: Testing Using Classical Variables Sampling



Example Audit Documentation for Attribute Sampling

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | Entity: |  | | | | |  | Period ended: |  | | | | |  |  | During Planning | | At End of Test | | |  |  | Initials | Date | Initials | Date | |  | Prepared by: |  |  |  |  | |  | Reviewed by: |  |  |  |  | |  |  |  |  |  |  | | **SECTION I** | **Definition of Control Techniques and Sampling Method for Attribute Sampling** | | | | | |  | Cycle: |  | | | | |  | Application: |  | | | | | Control activities (from SCE worksheets): | |  | | | | |  | | | | |  | Sampling method: | [ ] Random using IDEA/other audit software | | | | |  |  | Documentation reference to IDEA/other audit software output: | | |  | |  |  | [ ] Other – explain: |  | | | |  |  |  | | | | |  |  |  | | | | |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **SECTION II** | **Definition of Population and Attributes to Test for Attribute Sampling** | | | | | |  | Population is: |  | | | | |  | Population size: |  | units |  |  | |  |  |  | | | | |  | Attributes to test: |  | | | | |  |  |  | | | | |  |  |  | | | | |  | Document(s) to examine: |  | | | | |  |  |  | | | | |  |  |  | | | | | When this period is less than the entire period under audit or where the population being tested is less than the population in the financial statements, describe briefly (and cross-reference to) procedures for obtaining satisfaction about the remainder of the population: | |  | | | | |  | | | | |  | | | | |  | | | | |  | |  |  |  |  | | List steps needed to achieve satisfaction that the selection is from a population equivalent to the defined population: | |  | | | | |  | | | | |  | | | | |
| |  |  | | --- | --- | | **SECTION III** | **Determination of Sample Size and Evaluation of Sample Results for Attribute Sampling** | |  | | Control activity number | Deviation definitions (each will constitute a deviation)a | Preliminary assessment of control risk (see SCEs) | | | | | | --- | --- | --- | --- | --- | --- | --- | |  | Sample size  (per FAM Figure 450.1, IDEA, or other source) | | | | |  |  | Acceptable number of deviations | | | |  |  |  | Number of deviations found | | |  |  |  |  | Is result acceptable?bc | |  |  | A | B | C | D | E | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | | |  | aInsert deviation definitions and data for columns A through C for each control technique before selection of sample. | |  | bResults are acceptable if column D is less than column C. When results are unacceptable, complete section IV. | |  | cIf the attribute sample was selected through MUS as part of multipurpose testing and all items in the MUS sample are tested for attributes, then auditors should use IDEA’s MUS evaluation module instead of FAM Figure 450.1 to evaluate the results. | |  | Method of testing for more than one control activity:  [ ] Use largest sample size for all key controls (generally because same documents are tested) [ ] Use different sample sizes for different controls (using random numbers in order selected) | |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **SECTION IV** | **Explain Unacceptable Results and Other Control Deviations for Attribute Sampling** | | | | | |  | Deviation | Possible cause | Cycles, assertions, and accounts that could be affected | Further action taken | Conclusion/revised risk of material misstatement\* | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | | **SECTION V** | **Overall Conclusions about Risk of Material Misstatement** | | | | | |  |  | | | | | |  |  | | | | | |  |  | | | | | |  | \*Where the preliminary assessment of the risk of material misstatement is low, the risk may be assessed as moderate if the number of deviations found does not exceed the acceptable number of deviations in table II of FAM Figure 450.1 for the same sample size. | | | | | |

**Example Audit Documentation for MUS**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | Entity: |  | | | | |  | Period ended: |  | | | | |  |  | During Planning | | At End of Test | | |  |  | Initials | Date | Initials | Date | |  | Prepared by: |  |  |  |  | |  | Reviewed by: |  |  |  |  | |  |  |  |  |  |  | | **SECTION I** | **Define Objectives and Method of Testing for MUS** | | | | | |  | Line Item: |  | | | | |  | Assertion: |  | | | | | Test: | |  | | | | |  | | | | |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **SECTION II** | **Define Population for MUS** | | | | | | | |  | Population is: | |  | | | | | |  | Population size: | |  | monetary units (dollars) | | | | | Logical unit (balance or transaction that includes the selected dollar: | | |  | | | | | | Direction of test: | | Starting from (source): |  | | | | | | Testing to (documents to be examined): | | |  | | | | | |  |  | |  | | | | | | When this period is less than the entire period under audit or where the population being tested is less than the population in the financial statements, describe briefly (and cross-reference to) procedures performed to determine that the remainder of the population does not contain a risk of material misstatement: | | |  | | | | | |  | | | | | |  | | | | | |  | | | | | |  | | |  |  |  | |  | | List steps needed to achieve satisfaction that the selection is from a population equivalent to the defined population: | | |  | | | | | |  | | | | | |  | | | | | |  | | |  | | | | | | Population analyzed (see FAM 480.01) by: | | | [ ] Review of printout of population [ ] Review of manual listing of population [ ] IDEA/other audit software stratification [ ] Other computer-assisted method – describe: | | |  | | |
| |  |  |  | | --- | --- | --- | | **SECTION III** | **Determine Sample Size and Interval for MUS** | | | a. Total population (from Section II): | | | | b. Risk of material misstatement from the LIRA: | | | | c. Amount of substantive audit assurance required (from audit matrix): | | | | d. Substantive assurance from analytical procedures that relate to the assertion tested: | | | | e. Other substantive tests of detail that relate to the assertion: | | | | f. Minimum substantive audit assurance from detail tests: | | | | g. For MUS using IDEA/other audit software: | | 1. Confidence level: % | |  | | 2. Materiality (generally tolerable error): $ | |  | | 3. Expected misstatement amount: $ | | h. Interval based on these factors is: $ | | | | Random start or seed is: | | | | i. Sample size based on these factors is: | | | | Audit documentation reference to: | | [ ] Software output (IDEA/other audit software) | |  | | [ ] Manual computation | |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **SECTION IV** | **Evaluation of Substantive Tests for MUS** | | | | | | |  | (If many errors are found and the sample size is 75 or greater, the auditor generally should consult with the audit sampling specialist to evaluate and document as classical PPS.) | | | | | | | **Known Substantive Misstatements** | | | | | | | | Misstatement number | (A) | (B) | (C) | Nature of misstatement | Possible cause |  | | Book amount | Audited amount | Misstatement amount (A–B) | | Items greater than sampling interval | | | | | | | | 1 |  |  |  |  |  |  | | 2 |  |  |  |  |  |  | | 3 |  |  |  |  |  |  | | Total\* |  |  |  |  |  |  | |  |  |  |  | (D) |  |  | |  |  |  |  | Misstatement as a percentage of book amount\* (C/A) |  | Should misstatement be projected? If not, explain: | | Items less than sampling interval | | | | | | | | 1 |  |  |  |  |  |  | | 2 |  |  |  |  |  |  | | 3 |  |  |  |  |  |  | | Total\* |  |  |  |  |  |  | |  |  |  |  |  |  |  | |
| |  |  | | --- | --- | |  | \*Calculated amounts may be omitted if calculation was made using IDEA. | |  | Note 1: When sampling from a different population for understatement of a primary population (such as when sampling subsequent disbursements to test completeness of recorded accounts payable), in computing “misstatement as a percentage of book amount” the “book amount” is the subsequent disbursement (not the recorded payable). The audited amount is the amount that was either correctly accrued or not correctly accrued. For example, assume the auditor finds a $10,000 subsequent disbursement that was omitted improperly from accounts payable as of the balance sheet date. The “book amount” is $10,000 and the “audited amount” is zero, thus the “misstatement as a percentage of book amount” is 100 percent. The “book amount” is based on the source of selection, not necessarily what is recorded in the financial statements. | |  | Note 2: If IDEA/other audit software selects an item twice and it is misstated, include the item twice in this listing. | | **Compute projected misstatements** | | |  | (Omit steps E through H if computed by IDEA) | | (E) | Number of equivalent complete misstatements in sample from column D on previous page (excluding misstatements found in 100% of examined items – see Note 1 on previous page: | | (F) | Sampling interval | | (G) | Projected misstatements (E x F) | | (H) | Misstatements found in 100% of examined items | | (I) | Total projected misstatement (G + H) (or from IDEA output) | |  | (If from IDEA, document reference to IDEA output) | |  |  | | **Conclusion** | Are we satisfied that book amount is free from material misstatement? [ ] Yes [ ] No [ ] Not enough evidence | |  | If No or Not enough evidence, what will we do? Explain below: | |  |  | |  |  | |

**Example Audit Documentation for Classical Variables Sampling**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | Entity: |  | | | | |  | Period ended: |  | | | | |  |  | During Planning | | At End of Test | | |  |  | Initials | Date | Initials | Date | |  | Prepared by: |  |  |  |  | |  | Reviewed by: |  |  |  |  | |  |  |  |  |  |  | | **SECTION I** | **Definition Objectives and Method of Testing for Classical Variables Sampling** | | | | | |  | Line Item: |  | | | | |  | Assertion: |  | | | | | Test: | |  | | | | | Description of 100$ examined items: | |  | | | | |  | |  | | | | |  |  |  | | | | |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **SECTION II** | **Define Population for Classical Variables Sampling** | | | | | | |  | Population is: |  | | | | | |  | Population size: |  | Dollars | | | | |  |  |  | Number of items | | | | | Direction of test: | Starting from (source): |  | | | | | | Testing to (documents to be examined): | |  | | | | | |  |  |  | | | | | | When this period is less than the entire period under audit or where the population being tested is less than the population in the financial statements, describe briefly (and cross-reference to) procedures for obtaining satisfaction about the remainder of the population: | |  | | | | | |  | | | | | |  | | | | | |  | | | | | |  | |  |  |  | |  | | List steps needed to achieve satisfaction that the selection is from a population equivalent to the defined population: | |  | | | | | |  | | | | | |  | | | | | |  | |  | | | | | | Population analyzed by: | | [ ] Review of printout of population [ ] Review of manual listing of population [ ] IDEA/other audit software stratification [ ] Other computer-assisted method – describe: | | |  | | |  | |  | | | | | |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **SECTION III** | **Determine Sample Size for Classical Variables Sampling** | | | | | |  | a. Confidence level % | | | | | |  | b. Tolerable misstatement $ | | | | | |  | c. Precision for total population $ | | | | | |  | d. Strata definitions: | | | | | |  | Stratum | From | To | Number of Items | Dollars | | 1 |  |  |  |  |  | | 2 |  |  |  |  |  | | 3 |  |  |  |  |  | | 4 |  |  |  |  |  | | 5 |  |  |  |  |  | | 6 |  |  |  |  |  | | 7 |  |  |  |  |  | | 8 |  |  |  |  |  | | 9 |  |  |  |  |  | | 10 |  |  |  |  |  | |  |  |  |  |  |  | |  | e. Sample size based on these factors is: | | | | | |  | Audit documentation reference to:  [ ] IDEA/other audit software  [ ] Other calculation  [ ] Pilot sample estimate | | | | | |  |  | | | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **SECTION IV** | **Evaluation of Substantive Tests for Classical Variables Sampling** | | | | |  | a. Evaluation method – audit documentation reference to:  [ ] IDEA/other audit software  [ ] Other calculation  [ ] Spreadsheet | | | | |  | b. Estimating technique  [ ] Direct projection  [ ] Difference estimation  [ ] Separate ratio  [ ] Combined ratio  [ ] Combined regression  [ ] Other | | | | |  | c. Point estimate $ | | | | |  | Confidence interval | | | | |  | From $ | to $ | at % | confidence level | | **Conclusion** | Are we satisfied that book amount is free from material misstatement? [ ] Yes [ ] No [ ] Not enough evidence | | | | |  | If No or Not enough evidence, what will we do? Explain below: | | | | |  |  | | | | |  |  | | | | |

1. Audit testing can be performed using either audit sampling or nonstatistical selection. Audit sampling methods involve selecting individual items from a population with the objective of reaching a conclusion on all the items in the population. Audit sampling can be either statistical (intended to be representative of and statistically projected to the population) or nonstatistical (intended to be representative of but not statistically projectable to the population). Nonstatistical selection involves selecting items to reach a conclusion only on the items tested. [↑](#footnote-ref-1)
2. All decisions should be documented and supported. [↑](#footnote-ref-2)
3. The rate of control deviations expected is an anticipation of the deviation rate in the entire population. [↑](#footnote-ref-3)
4. In addition to number of sampling applications, many factors influence efficiency, such as sample size, number of locations it is necessary to visit to achieve audit objectives, nature of the audit procedures, extent of review required, and whether rework can be avoided by designing easy-to-follow procedures. [↑](#footnote-ref-4)
5. Usually, this is covered by selecting a larger audit sample than needed. If the auditor believes a larger audit sample is necessary, the auditor generally should consult with an audit sampling specialist. [↑](#footnote-ref-5)
6. Tables I and II assume a population over 5,000 items. If the population is smaller, the auditor may ask the audit sampling specialist to calculate a reduced sample size and to evaluate the results. The effect is generally small unless the sample size per the table is more than 10 percent of the population. [↑](#footnote-ref-6)
7. Using the AICPA guidance, the auditor computes the deviation rate and the upper limit at the desired confidence level (usually the same confidence level used to determine sample size). If the upper limit of deviations is less than the tolerable rate of deviation, the results support the control risk assessment. If not, the auditor should increase the assessed control risk when designing substantive procedures. [↑](#footnote-ref-7)
8. If data are disaggregated, the limit is still applied on an annual basis. [↑](#footnote-ref-8)
9. The principal techniques of selecting a nonstatistical sample are the use of random selection and haphazard selection to select sample items (AU-C 530.A17). Since a haphazard sample is not the same as a statistical sample, the auditor using a haphazard sample cannot calculate precision at a given confidence level. However, AICPA guidance indicates that the auditor may use the haphazard sample to make a judgment of what a statistical sample might have shown. For example, the auditor may use the haphazard sample to make a judgment as to the misstatement in areas that are not very significant. Even though the judgment will not be a statistical projection, it may assist the auditor in determining whether the possible misstatement could be material. [↑](#footnote-ref-9)
10. For example, it may not be efficient to use statistical sampling when the population is not in electronic format. Another example of when it may be difficult to apply statistical sampling is when the auditor plans to use audit sampling to test a physical inventory count and the entity does not maintain perpetual inventory records. Because either statistical or nonstatistical sampling can provide sufficient audit evidence, the auditor chooses between them after considering their relative efficiency and effectiveness in the circumstances. [↑](#footnote-ref-10)
11. This expectation affects the efficiency of the sample, not its effectiveness. GAO auditors who use IDEA to calculate sample size (based on the hypergeometric probability distribution) use classical variables sampling when they expect that more than 30 percent of the sampling units contain misstatements (no matter what the size of the misstatement). When GAO auditors expect that 10 percent or fewer of the sampling units contain misstatements, GAO auditors use MUS. When GAO auditors expect that 10 to 30 percent of the sampling units contain misstatements, they consult with the audit sampling specialist. The auditor, in consultation with the audit sampling specialist, generally should determine whether to use classical PPS to evaluate the sample to obtain a smaller precision, if a large misstatement rate is found. Other auditors, in consultation with their audit sampling specialists as applicable, may use different rules in deciding when to use MUS versus classical variables sampling. [↑](#footnote-ref-11)
12. This means, for example, that an item that has a selected amount of $1,000 cannot be misstated by more than $1,000. This is not an issue in testing existence (overstatement) or valuation (overstatement). However, it might be an issue in testing completeness (understatement) or valuation (understatement). Thus, if understatements larger than the selected amount are expected, the auditor generally should use classical variables sampling. [↑](#footnote-ref-12)
13. The 25 percent is a rough estimate that is used because the auditor cannot calculate the correct sample size. [↑](#footnote-ref-13)
14. As a general rule, this means 10 misstatements if the sample size is from 75 to 100, 10 percent if the sample size is from 100 to 300, and 30 if the sample size is over 300. Minimum sample size for classical PPS sampling is 75. [↑](#footnote-ref-14)
15. In cases where the auditor is relying on professional judgment, the auditor’s decisions should be documented and supported. [↑](#footnote-ref-15)
16. An obligation, as defined in OMB Circular No. A-11, is a binding agreement that will result in outlays, immediately or in the future. GAO’s Federal Budget Glossary (GAO-05-734SP) defines obligation as a definite commitment that creates a legal liability of the government for the payment of goods and services ordered or received, or a legal duty on the part of the United States that could mature into a legal liability by virtue of actions on the part of the other party beyond the control of the United States. Payment may be made immediately or in the future. An agency incurs an obligation, for example, when it places an order, signs a contract, awards a grant, purchases a service, or takes other actions that require the government to make payments to the public or from one government account to another. As a general rule, absent a specific statutory authority, the amount of the obligation is the maximum liability to the federal government. An entity’s budgetary obligation is not the same as its accounting liability, which is a probable future outflow or other sacrifice of resources as a result of past transactions or events (e.g., receipt of goods or services). The entity’s budgetary obligation is reported on the statement of budgetary resources whereas its accounting liability is reported on the balance sheet. [↑](#footnote-ref-16)
17. The auditor cannot assume that an instance of fraud or error is an isolated occurrence. Therefore, the consideration of how the detection of a misstatement affects the assessed risks of material misstatement is important in determining whether the assessment remains appropriate (AU-C 330.A75). [↑](#footnote-ref-17)