



DEFENSE CONTRACT AUDIT AGENCY
DEPARTMENT OF DEFENSE
 8725 JOHN J. KINGMAN ROAD, SUITE 2135
 FORT BELVOIR, VA 22060-6219

IN REPLY REFER TO

OTS 730.5

January 3, 2011
 11-OTS-001(R)

MEMORANDUM FOR REGIONAL DIRECTORS, DCAA
 DIRECTOR, FIELD DETACHMENT, DCAA
 HEADS OF PRINCIPAL STAFF ELEMENTS, HQ, DCAA

SUBJECT: Guidance on Variable Sampling Policy

This memorandum replaces 10-OTS-051(NR) dated August 31, 2010 in its entirety. There is no change in the previously stated Guidance on Variable Sampling Policy. The purpose of this memorandum is to change the releasability designation to (R) from (NR). The (R) designation denotes "releasable" and indicates that the MRD may be freely released to the general public without further consultation with the issuing office.

This memorandum provides significant revision to DCAA policy for variable sampling (statistical and nonstatistical). The three areas affected by the new audit guidance include: (1) establishing sample size, (2) evaluating sample results, and (3) reporting sample results in audit reports. The changes are effective October 15, 2010; however early implementation is strongly recommended. In-process statistical sampling applications should be completed using the sampling plan and evaluation criteria as originally designed.

The regions are strongly encouraged to provide training on DCAA changes for variable sampling. A PowerPoint based training presentation has been developed and will be made available for download from the DCAI Training Modules web site. We will issue a separate memorandum to the Regional Special Programs Managers and the Field Detachment, Chief, Technical Programs Division when the training package has been posted and is ready for downloading.

1. The following table will be used to establish the minimum sample size for statistical and nonstatistical applications of sampling universes consisting of more than 250 items.

<i>Expected Error Rate or Expected Variability in Questioned Ratios</i>	<i>Tolerable Misstatement</i>		
	<i>High</i>	<i>Moderate</i>	<i>Low</i>
<i>Low</i>	47	58	77
<i>Moderate</i>	69	86	114
<i>High</i>	87	109	145

The table reflects minimum sample sizes; if the audit risk warrants the subject sample sizes should be increased accordingly.

2. There will no longer be a requirement to establish an objective precision error percentage (objective precision amount/expected questioned dollars) in the sampling plan. The sample achieved precision will be evaluated in the sample evaluation phase. All statistical sampling applications will initially be based on a 90 percent confidence level for sample size determination and sample evaluation. Sample results must be evaluated and a decision made whether the achieved sample results are sufficient to support formulation of an audit position.

3. The audit report will disclose whether the auditor used a nonstatistical or statistical sample as a basis for the audit conclusions. The report will include details concerning the sample universe, the sampling method, and the sampling unit. The report will state whether the statistical sampling results were projected to the sampling universe. Audit reports with projections will also include the confidence level and confidence interval boundary amounts. If the results were not projected, the report should explain the reasons why the results could not be projected.

Background:

The DoDIG has cited DCAA with certain deficiencies regarding its sampling applications. The deficiencies included a lack of documentation and clarity in sampling plans. The DoDIG also recommended greater detail be included in the audit report. Subsequent reviews and correspondence have further identified issues with sample sizes and the sampling reliability parameters used in sampling applications. As a result of these concerns, the following significant changes are made to DCAA sampling policy.

Guidance:

Applicability:

The guidance applies only to variable sampling applications (statistical and nonstatistical). This memorandum does not apply to audit tests defined as judgmental selections.

The documentation requirements for judgmental selections are provided in MRD 09-PAS-003(R), dated January 30, 2009. By definition, judgmental selection procedures are not sampling applications. The AICPA, Professional Standards, vol. 1, AU sec. 350, states that audit sampling is “the application of an audit procedure to less than 100 percent of the items within an account balance or class of transactions for the purpose of evaluating some characteristic of the balance or class.” Simply stated, audit sampling involves examining less than the entire body of data to express a conclusion about the entire body of data.

A judgmental selection is an auditing procedure which is not considered audit sampling because they do not result in projecting the result of the examination of a portion of the population to the total population. The judgmental selection procedures and findings only apply

to the specific items selected. This is the key distinction between sampling versus judgmental selection testing.

Both statistical and nonstatistical samplings are designed to project sample results to the total population. Statistical sampling requires the use of statistical formulas to directly measure sampling risk whereas non-statistical sampling does not have these requirements. The results for statistical sampling are evaluated in terms of probabilities, which are defined as precision and confidence levels.

Sample Sizes:

Auditors should carefully assess if a sample methodology is the best approach when dealing with a small universe. Auditors should consider whether a judgmental selection methodology, such as only testing high dollar items, would be more efficient when a small number of items represent a significant portion of the universe value.

Generally, when sampling universes of 50 to 250 items, at least 20 percent of the items should be selected for review; with a minimum statistical sample size of at least 30 items. When the sample universe is greater than 250 items the sample size will be determined using the table below; which incorporates a 90 percent confidence level. The table is based on sampling theory from Monetary Unit Sampling, i.e., dollar unit sampling, which is the Agency’s preferred method of statistical sampling. The table can also be used for physical unit sampling; however, physical unit sampling generally requires the universe be stratified and larger sample sizes (perhaps 10 to 20 percent) may be necessary. Should the auditor choose to use the Sample Sizer option in EZ-Quant, he/she will use a 90 percent confidence level to establish sample size and must use sample sizes no less than those scheduled in the table below.

<i>Expected Error Rate or Expected Variability in Questioned Ratios</i>	<i>Tolerable Misstatement</i>		
	<i>High</i>	<i>Moderate</i>	<i>Low</i>
<i>Low</i>	47	58	77
<i>Moderate</i>	69	86	114
<i>High</i>	87	109	145

These are minimum sample sizes. If the audit risk warrants, these subject sample sizes must be increased accordingly. This table will be used for both statistical and nonstatistical sampling applications.

In addition to the confidence level, the table is based on two other considerations, which are: (1) the level of tolerable misstatement, and (2) the expected error rate or expected variability in cost questioned ratios. Both of these items impact sample size.

Tolerable Misstatement. Tolerable misstatement is a planning concept and is related to the auditor’s determination of materiality. Tolerable misstatement is the maximum error in the population (i.e., the account) that the auditor is willing to accept (tolerate). The auditor must

select a rating of: low, moderate, or high. When planning a sample for a test of details, the auditor should consider the amount of monetary misstatement in the related account balance that may exist before the account balance is considered materially misstated. The total potential misstatement represents the sum of those misstatements found in the sample and as a result of other related tests. This maximum monetary misstatement the auditor is willing to accept for the balance or class of transactions is called the tolerable misstatement for the sample.

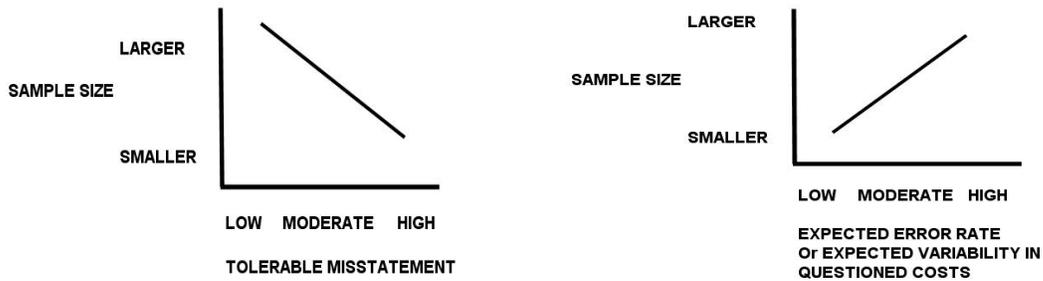
Guidance in CAM 2-309(b) states, "In engagements performed in accordance with GAGAS, it may be appropriate to use lower materiality levels as compared with the materiality levels used in non-GAGAS engagements because of the public accountability of government entities and entities receiving government funding, various legal and regulatory requirements, and the visibility and sensitivity of Government programs." When an auditor determines very little error or misstatement can exist in the account balance before an adjustment of the account balance would be necessary, the auditor would set the tolerable misstatement as low. As a result, a larger sample size is required in order to ensure misstatements will be identified.

For example, if two proposals were of equal value, we would typically have a higher tolerable misstatement for an audit of a cost type proposal versus an audit of a FFP proposal. If the cost type (CPFF) proposal had a proposed fee of 10 percent and the auditor found \$100,000 of questioned cost, the impact of the misstatement or questioned cost would be \$10,000 in fee. Using the same scenario with a FFP proposal, the impact would be \$100,000 plus applicable profit. As a result, the level of misstatement in the cost type proposal would have to be substantially higher before it approached the same impact to the government as in the FFP proposal example. Consequently, a higher degree of error is tolerable on a cost type proposal than on a fixed price proposal, and larger sample sizes would be expected in a fixed price proposal.

The Expected Error Rate or Expected Variability In Questioned Ratios. In determining a minimum sample size, using the column titled "Expected Error Rate or Expected Variability in Questioned Ratios" the auditor must also select a rating of: low, moderate, or high. This column represents the auditor's expectation that audit findings, in terms of costs questioned will represent a low, moderate, or high level. An assessment set at low results in a smaller sample size reflective of the auditor's expectation of few misstatements. An assessment set at high would reflect the auditor's expectations that a large number of errors exist in the account, for example contractor controls to identify unallowable costs are poorly designed or not operational. If you anticipate that the expected error rate (total cost questioned divided by universe amount) is substantial, then the assessment should move towards "high."

If you expect significant variability in the individual sampled items' cost questioned ratios (cost questioned/sample item's value), then the assessment should also move towards "high." For example, if you anticipate the cost questioned ratios will vary greatly (i.e., sample item 1- questioned 20 percent, sample item 11 – questioned 80 percent, sample item 25 – questioned 5 percent, etc.) from sample item to sample item then the assessment should move towards "high." Larger sample sizes are necessary when the auditor anticipates significant variability in the sample items questioned ratios.

For illustration purposes the impact of these assessments are presented below:



Auditors must consider both factors in determining the sample size. It is anticipated that most sampling applications will be assessed at the moderate level; however each sampling application requires its own unique, tailored and documented assessment based on the performing auditor's judgment. Considering both tolerable misstatements and the expected error rate will assist the auditor in selecting a sample size appropriate for the audit; balancing materiality and audit risk.

If the auditor has no knowledge regarding the tolerable misstatement, expected error rate, or the expected variability in questioned ratios, the auditor should assess these items using the most conservative assessment possible (i.e., using the largest resulting sample size).

All rationale used in assessing the level of tolerable misstatement and the expected error rate or expected variability in questioned ratios should be adequately documented in the sampling plan. The risk criteria assessment used to determine the sample size must be consistent with conclusions reached in the audit's risk assessment section of the working papers (i.e., working paper section B).

Sample Evaluation:

The auditor must determine if the sample results are reliable and therefore usable in the formulation of an audit position. This is accomplished in part by assessing the sample's precision amount in relation to the degree of sensitivity of audit risk factors. When the sampling results are deemed to be reliable, the sample's point estimate can be included in the formulation of the audit recommendation. One benefit of a properly executed statistical sample application is that it provides a mathematical estimate of the achieved confidence interval. When statistical sampling is used, the results may be validated in terms of how far the sample projection (point estimate) might deviate from the value that could be obtained by a 100 percent check.

Auditors will use the Agency EZ-Quant software to evaluate statistical sampling applications. The auditor will input exception amounts for the items examined into the EZ-Quant's Statistical Sampling Module and use the "Show Projection, Confidence Interval" button to project the sample results and compute a point estimate. A 90 percent confidence level should initially be used to compute the precision amount and evaluate the reliability of the sample results. The sample's achieved precision is computed by EZ-Quant.

There are many different factors that should be considered before an auditor decides whether to rely on sample results. Ultimately, the decision of whether to accept and use the projected sample results is based on auditor judgment. Some factors which should be considered in deciding whether to use a sample's projected results are:

- **Achieved Precision Error Percentage:**
 - Auditors should calculate the achieved precision error percentage (Precision Amount/Point Estimate) and compare it to the point estimate. If the achieved precision error percentage is 25 percent or less, the sample should generally be considered acceptable for projection purposes and inclusion in the audit recommendation.
 - There may be instances when the achieved precision error percentage is not as small as desired. At this point auditors should reevaluate to determine if the initial sample reliability objectives are still required to support an audit position. It may be appropriate for auditors to revise sample reliability objectives which may still allow the achieved sample results to be used in the formulation of an audit opinion. For example, the auditor may be willing to accept a wider confidence interval (that is, a larger precision error percentage) when evaluating (and performing a sampling of) elements of a cost type proposal because of the lower inherent level of audit risk with that contract type than would be expected in a fixed price evaluation. Or for example, other audit tests may have been performed that provide additional support for, and acceptance of, achieved sample results.
- **Reassess Sample Size and/or Confidence Level:**
 - The auditor should review the achieved sample results to determine whether using the initial planned 90 percent confidence level is still appropriate. If the confidence interval is very large (relative to the point estimate), you should consider increasing the sample size or consider acceptance of a reduced confidence level. Using the initial target 90 percent confidence level may have resulted in an excessively wide confidence interval. The auditor can also consider evaluating the sample using a lower confidence level such as 80 percent if the auditor's overall assessment of audit risk supports a reduced sample reliability requirement. For example, if no deficiencies have been reported on the contractor's systems, or the account under review is not of a sensitive nature or we have had few findings in the past and/or the audit type is considered to be low risk, a lower confidence level may be acceptable. Lowering the confidence level does not change the point estimate but does provide a narrower confidence interval.
 - The use of a confidence level below 80 percent is not recommended when the sampling test is the sole basis for supporting an audit position. Sampling applications using less than a 80 confidence level should be supplemented with additional audit tests of the same assertion, that when combined provide the auditor with sufficient appropriate audit evidence to afford a reasonable basis for an opinion. When initial

audit sampling results do not provide the level of reliability desired, the auditor has the option to expand the sample size if appropriate or to design additional audit tests, to support audit conclusions and recommendations.

Based on the above criteria including any other relevant knowledge, the auditor will determine whether the necessary degree of sample reliability has been achieved before using the projected sample results in the formulation of the audit recommendation. The sample evaluation is a required and critical step. Rationale used in determining whether a sample's result is acceptable in support of an audit position must be adequately documented in the audit working papers.

Audit Report Presentation:

Audit reports must now disclose whether the auditor used either a nonstatistical or statistical sample as a basis for the audit conclusions and will include details concerning the sample universe, the sampling method, and sampling unit. The report will state whether the statistical sampling results were projected to the sampling universe. Audit reports with projections will also include the confidence level and confidence interval boundary amounts. If the results were not projected, the report should explain the reasons why the results could not be projected.

- The following is a partial report note example from a physical unit sampling application which included projection of the sample results:

Summary of Conclusions. We performed a physical unit statistical sample (PUS) of ABC's Employee Morale account included in its Engineering Overhead pool and questioned \$3,391,654. All 2,387 account transactions were included in the universe of items. We reviewed a total of 110 transactions, with 24 transactions in the high dollar stratum for 100 percent review, and an additional 86 transactions randomly selected from the contractor's claimed costs. We projected the results of the statistical sample to the sampling universe using the Agency's EZ-Quant statistical analysis software. The summary results of our sample are presented in the schedule below:

(table providing summary claimed and questioned amounts by stratum)

Audit Evaluation. We calculated the point estimate (projected questioned costs) of the sample universe to be \$2,990,717. At the 90 percent confidence level, the subject confidence interval for the sampling strata is \$2,243,038 to \$3,738,397. Total questioned costs for both the high dollar items and the sample universe are scheduled below:

<i>100 percent reviewed items</i>	<i>\$400,937</i>
<i>Projection of statistical sample items</i>	<i><u>2,990,717</u></i>
<i>Total Questioned Cost</i>	<i><u>\$3,391,654</u></i>

- The following is a partial report note example from a dollar unit sampling application which did not include projection of the sample results:

Summary of Conclusions. We performed a dollar unit statistical sample to evaluate the contractor's proposed unit pricing and material requirements using the Dollar Unit Sampling (DUS) methodology with a random start. We selected a total of 101 parts, with 15 parts in the high dollar stratum for 100 percent review, and an additional 86 parts randomly selected from the proposed bill of material's (BOM's) universe of dollars. The total BOM is valued at \$25,864,794 and includes 2,747 material line items. The summary results of our audit are presented in the schedule below:

(table providing summary proposed and questioned amounts by stratum)

Audit Evaluation. We statistically evaluated the sample items selected using Agency EZ-Quant statistical analysis software and the results it produced. We determined the level of sampling error was too high to accurately project questioned costs. Therefore, the audit conclusions are based solely on examination of the cost questioned of only the 15 high dollar items and the 86 sample items without the projection of these items to the sample universe.

Comment on Documentation:

The working paper documentation of audit sample applications has historically been identified as an area for improvement. GAGAS require that auditors must prepare documentation in sufficient detail to provide a clear understanding of the work performed, the evidence obtained and its source, and conclusion reached. The documentation should be in sufficient detail to enable an experienced auditor, having no previous connection to the engagement, to understand the nature, extent, timing, and results of procedures performed.

Field audit office personnel should direct questions regarding this memorandum to their regional offices. Regional offices should direct their questions to the Technical Audit Services Division, at (703) 767-2238, or email DCAA-OTS@dcaa.mil.

/s/
Nina I.S. Kissinger
Deputy Assistant Director
Operations

DISTRIBUTION: C