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IN REPLY REFER TO

OTS 730.5

May 2, 2012
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MEMORANDUM FOR REGIONAL DIRECTORS, DCAA
DIRECTOR, FIELD DETACHMENT, DCAA
HEADS OF PRINCIPAL STAFF ELEMENTS, HQ, DCAA

SUBJECT: Audit Alert – Determining Sample Size for Statistical Sampling for Variables

The purpose of this audit alert is to clarify guidance in establishing a minimum sample size when performing an application of statistical sampling for variables on a sampling universe of more than 250 items. CAM 4-602.8f(1) provides the following sample size table based upon: (a) the auditor's assessment and determination of the level of tolerable misstatement and; (b) the expected error rate, or expected variability in cost questioned ratios. The table is based on a 90 percent confidence level.

<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

Summary

- The table assessments should be based on the sampling universe rather than the total audit population. Basing the sample size on an assessment of the entire audit universe before removal of high dollar and/or other high risk items may result in sampling more items than is warranted.
- All sample sizes from the above table are based on a 90 percent confidence level, and thus assume all sampling applications are of increased control and inherent risk. Therefore, auditors only assess tolerable misstatement and the expected error rate or expected variability in questioned ratios when choosing an appropriate sample size.

Discussion

The assessment of the tolerable misstatement and the expected error rate, or expected variability in questioned ratios, should be based on an assessment of the transactions contained in the *sampling* universe as opposed to the total audit population (or the complete universe of all items). The sampling universe consists of all items remaining in a universe **which have a**

chance for selection by sampling; and its total dollar value is the amount to which the audit adjustments contained in the sample will be projected. The sampling universe excludes high dollar and other atypical or sensitive items that are removed from the total population before sampling. For example, if an account is valued at \$10 million and the high dollar stratum review contains \$7 million dollars, the remaining sampling universe is \$3 million. The auditor should establish the desired minimum sample size based on an assessment of the \$3 million sampling universe and not the total audit universe value of \$10 million.

Segregating high dollar and/or sensitive transactions from the sampling universe may substantially lower the audit risk associated with the sampling universe, and thus, increase the assessment of tolerable misstatement and possibly decrease the assessment of the expected error rate or expected variability in questioned ratios. Basing the sample size on an assessment of the entire audit universe before removal of high dollar and/or other high risk items may result in sampling more items than is warranted.

Additionally, auditors should understand that all sample sizes from the above table are based on a 90 percent confidence level. The high 90 percent confidence level, by its nature, establishes that there is a need to achieve a high level of sample reliability because of increased control and inherent risk, and it results in larger sample sizes than sample size tables based on a lesser degree of assurance. All sample sizes from the 90 percent confidence level table assume high control and inherent risk associated with the account or cost element to be sampled for variables. Therefore, auditors need only assess tolerable misstatement and the expected error rate or expected variability in questioned ratios when choosing an appropriate sample size when sampling for variables.

Tolerable Misstatement

Tolerable misstatement is the maximum amount of error or monetary misstatement in the sampling universe that the auditor is willing to accept before a reportable audit adjustment is necessary. It equates to a materiality threshold for the sampling universe. However, as opposed to establishing an actual dollar value for a materiality threshold level, auditors must instead determine and classify the materiality threshold relative to the sampling universe as either, high, moderate, or low.

For example, if an auditor is performing an audit of a contractor's proposed indirect rates and is examining specific expense pools, the auditor may determine the amount of misstatement in the expense pools that would cause a materially significant change in the forecasted indirect rates. In a sampling application of these expense pools, the auditor must then equate this materiality threshold to an assessment of a high, moderate, or low level of tolerable misstatement; i.e., would it require a high amount of misstatement, a moderate amount of misstatement, or a low amount of misstatement to materially affect the associated rate and in turn significantly impact the related contract costs?

In a second example, an auditor is planning to statistically sample each of two separate indirect cost accounts from an incurred cost proposal valued at \$500 million. One account has a sampling universe value of \$5 million and the other account has a sampling universe value of

\$50 million. Assuming identical Government participation associated with each account, the auditor should think about the relationship of the sampling universe value to the total value of the incurred cost proposal on which an audit report opinion will be given. In this example, the auditor will likely conclude there is a higher tolerable level of misstatement for the \$5 million account than for the \$50 million account, and consequently there is a need to sample fewer items in the \$5 million account. To further illustrate, assume the auditor is willing to accept \$500,000 as a materiality threshold for this \$500 million incurred cost proposal audit. This materiality threshold amount is 10 percent of the \$5 million account but only 1 percent of the \$50 million account. Therefore, the materiality threshold as a percentage of the sampling universe, or tolerable misstatement, is higher for the \$5 million account than for the \$50 million account (10 percent versus 1 percent). Thus, in this example the auditor may assess tolerable misstatement as “high” for the \$5 million account and “low” for the \$50 million account.

Since the tolerable level of misstatement is assessed on the value of the sampling universe, auditors should be aware that establishment of a high dollar stratum may change the assessed tolerable level of misstatement. Auditors will typically assess the tolerable level of misstatement on the value of all items subject to the sampling application and then allow EZ-Quant to determine the high dollar stratum. If the value of the sampling universe decreases by a material amount after establishment of the high dollar stratum, the original assessed tolerable level of misstatement may need revision. In this case, auditors should reassess the tolerable level of misstatement to determine if a more efficient sampling application can be performed.

Expected Error Rate or Expected Variability in Questioned Ratios

The expected error rate, or expected variability in questioned ratios reflects the auditor’s expectation of the amount of variability among the individual sampled items’ cost questioned ratios (cost questioned divided by sample item’s value). For example, if the auditor anticipates the cost questioned ratios for each item will vary greatly from sample item to sample item (i.e., sample item 1- questioned 1 percent, sample item 11 – questioned 100 percent, sample item 25 – questioned 20 percent, etc.) then the auditor’s assessment should move towards “high.” Typically, there is considerable variability in the cost questioned ratios from sample item to sample item as opposed to most items having roughly the same cost questioned ratio.

Larger sample sizes are necessary when the auditor anticipates significant variability in the respective sample items questioned ratios in order to achieve accurate sampling results (less sampling error or precision error in terms of dollars). Auditors should be aware that as sample sizes become smaller, typically the overall cost questioned differences from sample item to sample item become increasingly significant as they gain relative importance in calculating the resulting confidence interval/sampling error. To determine this assessment, auditors should review results from previous audits of the same area or other related audits. If auditors expect unsupported costs in the sampling universe that will result in a 100 percent cost exception, the assessment for expected variability should likely be “high”. If auditors are unable to make an assessment of the likely variability in questioned cost ratios, the assessment should be “high”.

OTS 750.3

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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/

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