Sampling Steps

I. PLAN THE SAMPLE

A. Decide whether or not to sample. *(Applies to all circumstances.)*

1. Define the audit objective.

   a) The audit objective usually comes directly from the audit program or is a variation that has been modified by the auditor to fit the specific circumstances. If there is no standard audit program, the auditor must define an audit objective appropriate for the unique audit.

   b) Consider all knowledge available to date. All available information about the company and its Customs transactions should be considered in planning the audit and any required sampling. This information may come from prior audits, historical files, profiles, questionnaires, risk assessment, survey results, input from other Customs disciplines, etc. This information will help in refining the audit objective and the audit tests required to achieve that objective.

   c) Once the audit objective is defined, audit testing can be designed to achieve that objective. The appropriate audit testing will vary depending on the audit objective.

2. Identify the available data, records, and supporting documents.

   a) The available information, its method of storage and retrieval, and its format will directly impact the audit tests that can and should be applied.

   b) For example, if no electronic files are available, this would severely limit the macro analysis that could be performed and would restrict the sampling options as well.

3. Determine if macro analysis is possible and will achieve the audit objective.

   a) Macro analysis is any high-level analysis not involving the review of individual items or transactions. Macro analysis may include such procedures as considering total value balances or total duty paid, calculating potential value or duty impact, extracting and/or comparing data and totals from Customs and importer systems, analyzing variances, analyzing specific characteristics of extracted data, and analyzing relevant data trends.

b) Macro analysis is a key part of assessing risk exposure but may also be used anytime it will help satisfy the audit objectives. It can be more efficient and more precise than sampling and therefore, should be considered first. If macro analysis will achieve the audit objective, then there is no need to perform the remaining sampling steps herein. Thoroughly document all aspects of the macro analysis performed in compliance with audit documentation policies.

c) Micro testing, on the other hand, is the review of individual items or transactions (sampling) usually in order to make conclusions about the population or universe from which they are drawn. The remaining steps pertain to such micro testing or sampling.

B. If macro analysis is not sufficient to achieve the audit objective, decide on nonstatistical (judgmental) or statistical sampling. ***(Applies to nonstatistical and statistical sampling.)***

1. Define the sampling objective. The specific sampling objective (i.e., the reason to sample, the question you're trying to answer about the universe, what you're trying to test/measure, the audit statement you need to make, etc.) will help determine whether nonstatistical or statistical sampling is appropriate.

2. Nonstatistical sampling relies on auditor judgment to select the sample items and evaluate the sample results (except in the case of 100% review where actual results are known). Statistical sampling is an objective process for randomly selecting the sample items and statistically evaluating the sample results.

3. There are specific limited circumstances in which nonstatistical sampling is appropriate. Nonstatistical sampling is suitable if statistical results are not needed, there is a high degree of certainty that a conclusion can be drawn without further sampling, and

   a) the purpose is to take a survey in order to determine the necessity for and extent of substantive tests, and/or.

   b) there is a desire to concentrate audit effort in specific problem area revealed by a previous sample or other source of information, and/or

   c) the universe is very small and it would be quicker and easier to review all or most of the items in the universe, and/or

   d) the area is very sensitive and there is no room for error or exact results are needed so all of the items in the universe will be reviewed.

4. It is important to consider the first part of the requirement for nonstatistical sampling (i.e. statistical results are not needed and there is a high degree of certainty that a conclusion can be drawn without further sampling) because it is generally not appropriate to calculate compliance rates or to project dollar impacts (value or revenue) based on results of small nonstatistical samples. Compliance rates and dollar impacts could be based on results of 100% reviews because they represent actual results.

5. If statistical results are needed or you need more than a nonstatistical sample to make a conclusion (e.g., objective results, projections to the universe with measurable precision, or compliance rates), then nonstatistical sampling is not appropriate (unless 100% review is possible).

6. If nonstatistical sampling is chosen, skip to sampling step I.D. If statistical sampling is chosen, continue with sampling step I.C. below.

C. If nonstatistical sampling will not satisfy the sampling objective, decide on which type of statistical sampling (attribute discovery or variable sampling) is appropriate. ***(Applies to statistical sampling.)***

1. Attribute discovery sampling is a special kind of attribute acceptance sampling where the occurrence of even a single error constitutes a failure of the universe. Variable sampling is a form of substantive testing that is quantitative in nature and can be used to determine variance amounts or dollar impacts (e.g., materiality-based compliance rates, revenue due, etc.).

2. Attribute discovery sampling is appropriate when the area of review is sensitive and any systemic error would constitute noncompliance (and potentially fraud). This makes it appropriate for the review of transshipment or undeclared ADD/CVD. Attribute discovery sampling is also appropriate when no error is expected or errors result in penalties rather than revenue due (such as broker or bonded warehouse audits).

3. Variable sampling should be used in all other circumstances where statistical sampling is appropriate. Variable sampling may be physical unit sampling (where individual items or physical units are selected) or dollar unit sampling (where individual dollars are selected).

D. Select the sampling frame and unit. ***(Applies to nonstatistical and statistical sampling.)***

1. Identify available frames, their sampling units, and formats (i.e., electronic, hard copy printout, or physical items).

a) Whether nonstatistical or statistical sampling is used, potential sampling frames and sampling units must be identified. A sampling frame is the physical or electronic representation of the universe from which the sample is selected. The universe is the entire group of items comprising the category or area of interest to the auditor (to be tested). The sampling units are the individual units (e.g., items, transactions, lines, dollars, physical files, etc.) that are selected for review.

b) The available frames and units must be evaluated to determine which will best satisfy the audit and sampling objectives and the best sampling approach to take. An electronic frame is always superior to an identical physical frame or listing because it provides more flexibility and efficiency in the areas of frame analysis, sample selection, and sample results evaluation.

2. Consider the level of summarization of the frame and units and identify the available supporting records/documents and their level of summarization.

   a) Frames, units and supporting records and documentation can be at various levels of summarization. They may be at a very high level or a very low level. For example, an entry is made up of many entry/tariff lines, which may be made up of many invoices, which may be made up of many invoice lines, which may be made up of many parts/articles, which may be made up of many styles, which may be made up of many sizes and colors. Importer records and documents may group information similarly or by many other groupings such as by lot, container, purchase order, date received, batch processed, month, supplier, merchandise category, etc.

   b) Often, the higher the level of sampling, the more difficult the review because the more items and supporting documents that have to be reviewed. But this is not always the case. It depends on the sample items (nature, level of summarization and number) and the available supporting records and documentation (physical or electronic, level of summarization, and effort required to trace and verify the sample items).

   c) The ideal situation is one in which the supporting records and documents are summarized at the same level as the sample items or one in which the sample items are easily traced through and verified by the supporting records and documents. Problems occur or significant extra effort may be required when this is not the case (i.e., the sample items and supporting records and documents are at very different levels and/or the sample items are not easily traced/verified).

d) Also keep in mind the audit and sampling objectives - what is being tested. If the entered/reported data is being tested, then it would not be effective or efficient to sample and verify at a much lower level than that which is reported (e.g., sampling at a level of merchandise color when all colors are properly combined on an entry line for reporting classification, quantity, and value).

3. Based on the available choices, select the best frame and unit to effectively and efficiently accomplish the audit and sampling objectives.

   a) Ask: "If I select this frame and sampling unit, what am I really testing and what procedures will I have to perform? What and how many records and documents will I have to review? What difficulties will I have tracing the sample items through the records and documents? What manual or electronic calculations or summarization will I have to perform in order to trace and verify the sample items? Will this satisfy the audit and sampling objective? Is there a better (more efficient or effective) frame or sampling unit?

   b) An electronic file generally works best with any kind of nonstatistical or statistical sampling. If an electronic file is not available, a printout/listing or a physical item frame can be used for nonstatistical and variable physical unit sampling. A small printout or listing that could easily be typed into EZ-Quant could be used for variable dollar unit sampling.

   c) If nonstatistical sampling is being used, skip to sampling step I.H. If statistical sampling is being used, continue with sampling step I.E. below.

E. Validate the frame. ***(Applies to statistical sampling.)***

1. The purpose of frame validation is to determine if it is an adequate representation of the universe intended for testing

   a) Remove credit/negative items and zero balance items from the frame. Proper sampling requires that duplicate items (e.g., credit/negative items with corresponding debit/positive items) and zero value items that have more than one chance or no chance of selection be removed from the frame – either for separate review (separate sample or 100% review) or for no review.

   b) Compare/reconcile the chosen frame with the intended universe or another potential frame to try to verify that it is a complete and accurate listing suitable for the intended objective.

For example, if the intended universe is all GSP parts received and a frame extracted from an importer parts database is chosen, this frame could be compared to GSP reported to Customs in ACS. Or if the intended universe is all imported value and classifications and a frame of ACS entries is chosen, this frame could be compared to the inventory receipts (all imports) for the year.

2. The primary purpose of these types of comparisons is to ensure that you have good data from which to sample. However, as a form of macro analysis, these reconciliations could also reveal additional risk areas or potential problems, such as potential unreported value, misclassified merchandise, over-declarations of GSP, under-declarations of ADD/CVD, etc.

3. Analyze any variances and adjust the frame, accept the frame, or reject the frame and select another as appropriate.

   a) There are many things that might cause a variance between the frame and universe (or two frames representing the same information). Some common causes of variances are as follows:

      (1) Timing or time frame differences. There are various dates in Customs ACS system (create date, entry date, export date) which are usually different from the dates in the Importer's system (received date, order date, paid date). Therefore, there could be some timing differences when trying to compare ACS data with importer data.

      (2) Excluded items. Due to the complexities of data and data systems and the potential for miscommunication, it is common for whole categories of data to be excluded from one frame or another. This might be data associated with a particular country, vendor, division, importer ID, or broker. Or it might be data assumed to be unique, dissimilar, or irrelevant such as samples, merchandise purchased for use rather than resale, returns, merchandise in transit, drop shipments, consignments, or informal entries.

      (3) Problems with the data source or EDP system. Sometimes data is incomplete because only one partially complete source was accessed when the rest of the data is contained in another file, database, or system.

   b) Various methods can be employed to identify the cause of a variance. Questioning about merchandise receipt timing will help to identify and adjust for timing variances. Computer analyses (such as summing and comparing totals by country, MID and vendor, tariff and merchandise descriptions) may help identify missing categories of data. Grouping queries may show that duplicate records are present.

c) Once the cause has been determined, a decision must be made if the frame can and should be corrected or adjusted, accepted as is, or rejected and another frame used instead. The key will be the audit and sampling objective (the intended universe and testing) and whether adjustments are actually viable.

4. If attribute discovery sampling is being used, skip to sampling step I.H. If variable sampling is being used, continue with sampling step I. F. below.

F. Analyze the frame variability and anticipated/potential errors. ***(Applies to statistical variable sampling.)***

1. Frame variability refers to the differences and similarities among sampling units within the frame, in terms of dollar amounts and characteristics.

2. The degree of frame variability will help determine the required sample size and the best sampling approach.

a) Determine the skewness by calculating the measures of central tendency.

(1) Calculating the mean, median, and mode (AVERAGE, MEDIAN, and MODE functions in Microsoft Excel) will indicate the skewness of the frame. If the mean is greater than the median, then the frame is right skewed, meaning that there are a few high dollar items and many low dollar items. If the mean is less than the median, then the frame is left skewed, meaning there are a few low dollar items and many large dollar items. The greater the difference between the mean and median, the greater the skewness. Skewness is an indication of dollar variability and may also point to the need for horizontal stratification (by dollar amount).

(2) A highly skewed universe (left or right) would point towards a larger stratified physical unit sampling. A highly left skewed universe would point towards a larger dollar unit sampling.

b) Determine the dollar variability by calculating the indices of dispersion (standard deviation and coefficient of variation).

(1) Standard deviation is the average distance of individual values or the extent to which individual values depart from the average. In Microsoft Excel, it can be calculated by using the STDEVP function. The larger the standard deviation, the more variation. (Do not use any other STD functions in Microsoft Excel as will result in a different, incorrect result.)

(2) The coefficient of variation (CV) is the standard deviation expressed as a percentage. The formula is Standard Deviation of the frame /

Mean of the frame * 100. The higher the CV, the more dollar variation in the frame. Generally, a CV < 50% indicates low variation, a CV between 50% and 100% indicates moderate to high variation, and a CV over 100% indicates very high variation.

(3) A higher CV (≥50%) would point towards a larger stratified physical unit sample or a larger dollar unit sample.

c) Determine if there are obvious dollar breaks or groupings (for horizontal stratification). (Applies if the universe is highly skewed and/or the CV ≥ 50%.)

(1) High skewness, standard deviation, and CV indicate high dollar variation and probably a need to stratify – at least horizontally (on dollars) and possibly vertically (on characteristics). Sorting the frame in Microsoft Excel (by dollar amount) may reveal clear divisions or groupings of similar dollar amounts. (This type of analysis may also be performed by creating various tables and reports in Microsoft Access.)

(2) Obvious dollar breaks or groupings would point towards a larger manually stratified physical unit sample. It could also point towards a dollar unit sample with a 100% review high dollar stratum if the obvious dollar break is between high dollars and the rest of the frame.

d) Analyze the characteristics to determine if logical groupings exist (for vertical stratification).

(1) Analyzing the frame in Microsoft Excel (sorting, subtotaling, creating pivot tables, etc.) by description, part number, HTS or tariff number, account number, product lines, size, quantity or any other relevant characteristic may reveal common characteristics or categories that should be grouped together. (This type of analysis may also be performed by creating various tables and reports in Microsoft Access.)

(2) A highly variable frame in terms of characteristics would point towards a larger stratified physical unit sample or multiple dollar unit samples.

e) Identify special, very low risk, or very high risk items and decide whether to leave them in the frame for random sampling or remove them from the frame for no review or 100% review.

(1) These may be, for example, very low dollar items, very high dollar items, informal entries, consignee entries, etc.

(2) Very low dollar items may be eliminated from the frame IF the team agrees that there are no potential significant issues or errors that

could occur. Be cautious about automatically assuming that low dollar items are insignificant. It may not be appropriate to exclude the low dollars if:

(a) the frame contains clusters (the apparently low dollar items may not be low in comparison to the individual items making up the clusters),

(b) they are significant in the aggregate,

(c) they represent sensitive special trade areas, or

(d) the value is known or suspected to be significantly understated.

(3) For example, one company had approximately $350,000 in low dollar sample merchandise out of $65 million total reported value. These were left in the frame and some were chosen in the sample. During the attempt to support the sample merchandise value, the importer discovered they were significantly undervalued and submitted a disclosure for approximately $1.5 million with revenue due of about $300,000. If these low dollar items had been deleted from the frame for no review, the errors would not have been discovered and this loss of revenue would not have been recovered.

3. Define the anticipated or potential errors.

a) The frequency, types, and amounts of the anticipated or potential errors will help to determine the best sampling methodology for the situation.

b) Frequent errors, including small errors, would point towards physical unit sampling. Infrequent large errors would point towards dollar unit sampling.

G. Determine the best variable sampling method (physical unit or dollar unit) based on the results of the frame analysis. *(Applies to statistical variable sampling.)*

1. Physical unit sampling generally works best with:

a) An electronic frame, a printout or listing frame, or a physical item frame.

b) Any amount of frame variability, including one that is highly variable in terms of dollars and characteristics.

c) Sampling units that are individual items or sampling units that are clusters of items where reviewing the entire cluster is acceptable

(i.e., the clusters consist of a few items and/or reviewing whole clusters would not require significant additional effort to trace through the supporting records and documents).

d) The anticipated or potential errors are frequent, including small errors.

2. Dollar unit sampling generally works best with:

a) An electronic frame or a small printout or listing frame that could be typed into EZ-Quant.

b) A frame that is not highly variable or a frame that is highly variable in terms of dollars (especially left skewed) but not in terms of characteristics. (Dollar unit sampling may be used with a frame that is highly variable in terms of characteristics, but it would require multiple dollar unit samples.)

c) Sampling units that are clusters of items where reviewing the entire cluster is not acceptable (i.e., reviewing entire clusters would require significant additional effort to trace through the supporting records and documents).

d) The anticipated or potential errors are infrequent large errors.

H. Establish appropriate sample/strata sizes and sampling parameters. ***(Applies to nonstatistical and statistical sampling.)***

1. Nonstatistical (judgmental) samples.

a) Sample sizes for nonstatistical samples will depend on the type of audit, audit objective, and sample objective.

b) For Focused Assessment (FA) Pre-Assessment Survey (PAS), sample sizes will be 1 to 20 depending on the results of the initial risk exposure and internal control assessment as follows:

(1) Low risk exposure and strong internal controls = low end of 1 to 10 range.

(2) Low risk exposure and adequate internal controls = middle of 1 to 10 range.

(3) Low risk exposure and weak internal controls = high end of 1 to 10 range.

(4) Moderate risk exposure and strong internal controls = low end of 5 to 15 range.

(5) Moderate risk exposure and adequate internal controls = middle of 5 to 15 range.

(6) Moderate risk exposure and weak internal controls = high end of 5 to 15 range.

(7) High risk exposure and strong internal controls = low end of 10 to 20 range.

(8) High risk exposure and adequate internal controls = middle of 10 to 20 range.

(9) High risk exposure and weak internal controls = high end of 10 to 20 range.

c) For most other audits, nonstatistical sample sizes will generally be 100% of the review area. If the review area is much larger than a normal statistical sample size (60 to 100), then statistical sampling should be considered instead of nonstatistical sampling.

2. Attribute discovery samples.

a) Sample sizes for attribute discovery samples are determined by running EZ-Quant ATTDISC (DOS Version 3.10) or Attribute Sample Size Determination Procedure (Windows Version 1.0.1). The procedure will generally result in sample sizes within the range of 59 to 90, depending on the frame size and specified sampling parameters of critical error rate and government risk. The critical error rate is the maximum acceptable error rate in the universe. The government risk is the tolerable level of risk of accepting a faulty universe (one with an actual error rate exceeding the critical error rate).

(1) For circumstances where any systemic error results in noncompliance (e.g. FA Assessment Compliance Testing or Follow-up of transshipment or undeclared ADD/CVD), the appropriate parameters to use are 5% critical error rate and 1% government risk.

(2) For those instances when no errors are anticipated or errors result in penalties rather than revenue due (e.g., broker or bonded warehouse audits), the appropriate parameters to use are 5% critical error rate and 5% government risk.

b) Although the purpose of an attribute discovery sample is to determine if any error exists rather than estimate dollar impacts, there could be situations in which estimating dollar impacts based on the sample results is appropriate or necessary. A desired precision percentage under 100% and confidence level of 95% (same as for variable sampling) should be established for just such a possibility.

The desired precision percentage should be based on auditor judgment of what would be acceptable for the situation. The achieved precision percentage will be compared to the desired precision percentage when determining the acceptability of the projection.

3. Variable samples.

   a) Variable sample sizes depend on the variability in the sampling frame. The more variability in the frame (dollars and characteristics), the larger the sample size required to achieve acceptable sample results. Minimum sample size guidelines (based on statistical principles) have been established to assist auditors in determining appropriate variable sample sizes.

      (1) Physical unit samples.

         (a) If the frame is homogenous, then the minimum sample required is 1 sample with 1 stratum of 60 items. A homogenous frame is one with low variability in dollars and characteristics (i.e. similar dollars and characteristics). Indicators of low dollar variability are low skewness, low standard deviation, low CV (< 50%) and no obvious dollar breaks or groupings. Low characteristic variability would be a frame with no obvious groupings by characteristics.

         (b) If the frame is nonhomogenous, then the minimum sample required is 1 sample of 3 random strata plus 1 high dollar 100% review stratum. A nonhomogenous frame is one with high variability in dollars and characteristics (i.e. dissimilar dollars and characteristics). Indicators of high dollar variability are high skewness, high standard deviation, high CV (≥ 50%) and obvious dollar breaks or groupings. High characteristic variability would be a frame with obvious groupings by characteristics. The total sample size should be at least 100 items. Each random stratum should be at least 30 items, except when 30 items would be more than 5% of the items in the entire stratum. In that case, the stratum size can be 5% or 15 items, whichever is greater.

         (c) Generally, the larger the total sample size and the more strata, the better the achieved precision will be.

      (2) Dollar unit samples.

         (a) If the frame is homogenous, then the minimum sample required is 1 sample of 100 units. A homogenous frame is one with low variability in dollars and characteristics (i.e. similar dollars and characteristics). Indicators of low dollar variability

are low skewness, low standard deviation, low CV (< 50%) and no obvious dollar breaks or groupings. Low characteristic variability would be a frame with no obvious groupings by characteristics.

(b) If the frame is nonhomogenous due to high dollar variability, then the minimum sample required is 1 sample of 100 units. Indicators of high dollar variability are high skewness, high standard deviation, high CV (≥ 50%) and obvious dollar breaks or groupings.

(c) If the frame is nonhomogenous due to high characteristic variability, then the minimum samples required are multiple samples of 60 units each (one for each characteristic grouping). High characteristic variability would be a frame with obvious groupings by characteristics. Physical unit sampling is usually better at handling high variability in characteristics. But if clusters are present which would be difficult to review in their entirety and if there only 2 or 3 major characteristic groupings, then dollar unit sampling may still be used.

(d) Generally, the larger the total sample size (or the more samples for characteristic variability), the better the achieved precision will be.

b) Sampling parameters for variable samples will be 95% confidence level and desired precision percentage < 100%. The desired precision percentage should be based on auditor judgment of what is acceptable for the situation. The achieved precision percentage will be compared to the desired precision percentage when determining the acceptability of the projection.

II. SELECT THE SAMPLE

A. Nonstatistical samples.

1. Since nonstatistical sampling is based on auditor judgment, any selection method appropriate for the circumstances may be used. The auditor should keep in mind the audit and sampling objectives when determining the best selection process.

2. Some common techniques are as follows:

a) Purposive testing is a method that attempts to select sample items with known or suspected problems. This method would be appropriate for the FA PAS, which is a risk-based survey to find problems if they exist. The auditor would select the highest risk areas/items.

b) Cross-section testing is a method that selects sample items from all parts of the area being tested. A common technique is to designate a fixed percentage to test, such as 2%, and then select every nth item to reach the 2%. If this method employed a random start, it would actually be a statistical systematic interval selection. But often, items are just chosen haphazardly across the area being tested until the desired quantity is obtained. This method would be appropriate for FA PAS if there were no identified higher risk areas or items on which to focus

c) Large dollar testing is a method that selects the largest dollar items for review. Emphasis is placed on the materiality of the items selected. This could be appropriate for FA PAS if the higher dollar items are determined to be the highest risk items. However, keep in mind that a breakdown of internal controls is often more pronounced in the lower dollar items.

d) Block testing is a method that selects specific blocks of units. The blocks may be periods of time or consecutive groupings, such as all expense vouchers in June or all invoices with vendor names beginning with the letters M through P. This method would be appropriate for FA PAS only if the selected blocks represent the high risk areas/items.

e) Convenience testing is a method of selecting the most convenient sample items for review. The most readily available items are selected, without reason or randomness, simply because it is expedient. Records that are in storage, in the bottom or back of file drawers, not yet filed, or at another location are excluded when this type of testing is used. This method rarely reflects good auditor judgment, may be manipulated by the auditee, and is not recommended for any audit situation.

B. Attribute discovery and variable physical unit sampling.

1. The same selection methods may be used for both attribute discovery and variable physical unit sampling because both statistical sampling types select physical units for review.

2. The following are sample selection options:

a) EZ-Quant RANUM (DOS Version 3.10) or Random Numbers Generator (Windows Version 1.0.1) is a procedure that generates random numbers that can then be manually or electronically applied (using macros or mini-programs) to a frame to select the sample items. It is suitable for an electronic frame, a numbered printout or listing, or a numbered physical item frame. It could also be used with

a small unnumbered printout/listing or physical items frame, but the frame would have to be manually numbered before the sample items could be selected.

This procedure can be used for manually stratified physical unit samples. If obvious dollar breaks or characteristic breaks were identified during frame analysis, then RANUM may be run for each manually identified stratum to randomly select the sample items.

b) EZ-Quant RASEQ (DOS Version 3.10) or Random Number Sets Generator (Windows Version 1.0.1) is a procedure that generates sets of random numbers that can then be applied to a frame to select the sample items. It is suitable for an unnumbered printout/listing or an unnumbered physical item frame with a hierarchical structure. For example, the first number in the set would represent the page or drawer and the second number in the set would represent the line on the page or the file in the drawer. It can be used when stratification is not necessary, the frame is already stratified, or the frame can be stratified prior to sample selection.

c) EZ-Quant STRAT (DOS Version 3.10) or Physical Unit Sample Selection Procedure (Windows Version 1.0.1) is a procedure that can stratify (on dollars) and randomly select physical units. It is suitable for an electronic frame or a small printout/listing that can be typed into the program.

It can be used for attribute discovery sample selection by specifying 1 random stratum and no high dollar stratum/items.

For variable physical unit samples, the procedure will automatically sort and stratify the frame into equal dollar strata, and then randomly select sample items for each stratum. It works best with a frame that is highly variable in terms of dollars, but not in terms of characteristics. If obvious dollar breaks or characteristic breaks were identified during frame analysis, then EZ-Quant RANUM (Random Numbers Generator), may be used instead to randomly select sample items for each manually identified stratum.

d) Manual systematic interval selection is a procedure for manually selects every nth item with a random start. It should be considered when the only available frame is an unnumbered physical item frame and selecting every nth item would result in a better cross-section of items or would be easier and quicker than using RASEQ. The process is as follows:

(1) Estimate the frame size (if unknown). It is better to underestimate than overestimate.

(2) Compute the interval (frame size / desired sample size). Truncate the result to a whole number.

(3) Run EZ-Quant RANUM (Random Numbers Generator) to get a random start between 1 and the interval. The random start will be the first sample item.

(4) Add the interval to the random start to get the second sample item. Continue adding the interval to select the rest of the sample items.

(5) Do not automatically stop when the desired sample size is achieved. The process is not complete until the end of the frame is reached. To stop before the end of the universe would invalidate the statistical sample because every item would not have an equal chance of selection. The actual sample size may be slightly larger than the initial desired sample size.

(6) The sample may be properly expanded by removing the previously selected sample items from the frame and repeating the above steps (calculating a new interval, running EZ-Quant RANUM Random Numbers Generator to get a new random start, and selecting the additional items from the revised frame).

(7) The sample may be properly decreased by randomly (using EZ-Quant RANUM Random Numbers Generator) selecting items for removal from the entire sample. It would not be proper to merely disregard the last items selected. To do so would invalidate the statistical sample because every item would not have an equal chance of selection.

e) Other computer programs, such as Microsoft Access or SAS, may be used if the electronic frame is too large to fit into Microsoft Excel (for analysis, manual stratification, or application of random numbers) or too large to fit into EZ-Quant STRAT Physical Unit Sample Selection Procedure (for stratification and/or sample selection). Auditors should consult with a CAS if they encounter this situation.

C. Variable dollar unit sampling.

1. Dollar unit sampling is unique in that it randomly selects dollars instead of physical units. The selected dollars (dollar hits) are then tied to physical units which are reviewed.

2. The following selection methods may be used for dollar unit sampling:

a) EZ-Quant DUSSEL (DOS Version 3.10) or Dollar Unit Sample Selection Procedure (Windows Version 1.0.1) is an automated systematic interval selection procedure. It works with an electronic frame or a small printout/listing that can be typed into the program.

The procedure will identify the dollar hits, but if the sampling units are clusters, then the physical items associated with each dollar hit must be identified manually. This is done by calculating cumulative totals for the cluster items and then locating the item within the cluster that contains the dollar hit.

b) Manual systematic interval selection. This method manually selects every nth dollar with a random start. While it is possible for use with a printout or listing, it is generally not recommended for dollar unit sampling due to the amount of effort required to manually select the dollar hits.

c) Other computer programs, such as Microsoft Access or SAS, may be used if the electronic frame is too large to fit into Microsoft Excel (for analysis) or too large to fit into EZ-Quant DUSSEL Dollar Unit Sample Selection Procedure (for sample selection). Auditors should consult with a CAS if they encounter this situation.

III. DOCUMENT ALL ASPECTS OF THE SAMPLE PLANNING AND SELECTION

A. Audit documentation must fully and clearly document all aspects of the sampling that was used. This documentation must be prepared for each sample (nonstatistical and statistical) and must comply with audit documentation policies.

B. The following sample planning and selection items should be included for each sample:

1. A sampling plan that documents the sample planning and selection must be included. Standard sampling plan forms for this purpose are contained in Appendix IV. The sections labeled Sampling Application, Sampling Approach, Universe and Frame Information, and Sample Information pertain to sample planning and selection and should be completed at this point.

2. The sampling frame itself must be included as part of the audit documentation. Electronic frames can be directly incorporated into the automated working papers. If the frame is hard copy, it can be scanned in or maintained separately if too voluminous for scanning. If it is maintained separately, it should be properly explained and referenced in the automated documentation in accordance with audit documentation policies.

3. The procedures used to validate the sampling frame must be documented. Any analysis or file comparisons done in an attempt to validate the frame as an adequate representation of the intended universe must be adequately explained.

4. Analysis of the sampling frame variability must be thoroughly explained and documented. This would include the calculation of measures of central tendency and indices of dispersion (mean, median, mode, standard deviation, and coefficient of variation), the determination of any obvious dollar or characteristic groupings for manual stratification, and identification of special items for separate or no review. These analyses and the related conclusions must be fully and clearly presented.

5. The sample size and how it was determined must be included. For attribute discovery sampling, this would include the EZ-Quant ATTDISC Attribute Sample Size Determination Procedure output. For variable sampling, this may be a conclusion on the frame analysis documentation explaining the application of the sample size guidelines based on the frame variability.

6. The random selection methodology must be documented. This includes the random numbers or random procedure applied for statistical samples or the judgmental procedure and reasoning for nonstatistical samples. EZ-Quant output and its application to the frame (if used) must be included and explained.

7. The selected sample items themselves should be properly documented. This may be accomplished with the sample selection documentation and/or the sample review documentation.

8. Any other documentation produced during the sample planning and selection should be included as appropriate.

IV. REVIEW THE SAMPLE

A. Review each sample item.

1. Perform the review of each sample item based on the established criteria and audit program as required to achieve the audit and sampling objectives.

2. Use the standard RAMIS worksheet and add any additional columns required to perform and document the review.

B. Determine the cause of each error and whether it is systemic/ nonsystemic and recurring/nonrecurring.

1. The cause of the error is critical to understanding the nature of the problem and making appropriate recommendations. The nature of the error is also important for proper computation of compliance rates and projection of dollar impact.

2. Each error will be identified as systemic or nonsystemic AND recurring or nonrecurring for this purpose.

   a) Systemic errors are those caused by a deficiency in the system of internal controls. If the system is corrected or internal controls strengthened, the error should not recur. Clerical or human error (especially if such errors are repetitive) that occurred because there were no internal controls in place to try to prevent or catch such errors (i.e., training, supervision, written instructions, monitoring, checking, etc.) would also be systemic. Systemic errors are also recurring errors, even if only one is found, because they could recur due to the system deficiency. Only systemic errors are included in the determination of compliance.

   b) Nonsystemic errors are those not caused by any apparent weakness in internal controls. Typically these are occasional clerical or human errors that occurred despite adequate internal controls (i.e., training, supervision, written instructions, monitoring, checking, etc.). Nonsystemic errors may also be recurring if they display a pattern or trend that they are likely to recur. For example, repetitive clerical errors may be indicative of some sort of weakness in the internal controls, such as incompetent personnel, inadequate training, lack of supervision or monitoring, etc. The designation of systemic or nonsystemic is required for the determination of compliance. Only systemic errors are included in the computation of compliance rates. Nonsystemic errors are not used when calculating compliance rates

   c) Recurring errors are those that could recur in the frame from which the sample was taken. Typically these are systemic errors. They may also be nonsystemic errors that display a pattern or trend that they are likely to recur (e.g., repetitive clerical errors are recurring errors). The designation of recurring or nonrecurring is required for revenue projection. Only recurring errors are projected. Nonrecurring errors are not projected. However, nonrecurring errors should be added to the projected revenue loss when calculating total revenue loss.

   d) Nonrecurring errors are those that would not be expected to recur in the frame from which the sample was taken. Typically these are nonsystemic, isolated clerical or human errors that occurred despite adequate internal controls (i.e., training, supervision, written instructions, monitoring, checking, etc.). They could also be errors found outside the sampling frame. The designation of recurring or nonrecurring is required for revenue projection. Only recurring errors are projected. Nonrecurring errors are not projected. However, nonrecurring errors should be added to the projected revenue loss when calculating total revenue loss.

V. EVALUATE THE SAMPLE RESULTS

A. Calculate compliance, if applicable.

1. Compliance, when applicable (i.e. the determination of compliance is an audit/sampling objective), will generally be based on the value of systemic errors found in the sample. See Appendix IV of this document and FA Program Exhibit 3F for more guidance on how to compute compliance rates.

2. Remember that it is generally not appropriate to compute compliance rates based on the results of small nonstatistical samples.

B. Calculate the total revenue due.

1. Loss of revenue estimates should be based on the most accurate information available. Actual amounts, if known (e.g. 100% review was performed), would be the first choice. Otherwise, statistical projections or other reasonable means of estimating revenue due may be used.

2. Statistical projections.

   a) EZ-Quant SAMPL Physical Unit Sample Evaluation Procedure may be used to project revenue due for attribute discovery and variable physical unit samples. The procedure projects the sample revenue due to the universe and provides reliability measures for evaluating that projection. It provides two point estimates (one for the ratio method and one for the difference method) along with associated precision dollars and confidence intervals based on the confidence level specified. The confidence level used will be 95%. The point estimate with the lowest precision percentage (precision dollars / point estimate) should be selected.

   b) EZ-Quant DUSAM Dollar Unit Sample Evaluation Procedure may be used to project revenue due for variable physical unit samples. The procedure projects the sample revenue due to the universe and provides reliability measures for evaluating that projection. It provides a point estimate along with associated precision dollars and confidence intervals based on the confidence level specified. The confidence level used will be 95%.

   c) Other computer programs, such as Microsoft Access or SAS, may be used to statistically project and evaluate statistical sample results if electronic files are too large for EZ-Quant SAMPL Physical Unit Sample Evaluation Procedure or EZ-Quant DUSAM Dollar Unit Sample Evaluation Procedure. Auditors should consult with a CAS if they encounter this situation.

d) The achieved precision percentage (precision dollars / point estimate) should be compared to the desired precision percentage from the sampling plan when determining the acceptability of the point estimate. If the achieved precision percentage is ≤ the desired precision percentage, then the projection is acceptable. Otherwise, the sample methodology and sample errors must be reevaluated to determine the appropriate course of action. See the Sample Results – Duty Due section of the sampling plans in Appendix IV for various options.

3. Total revenue due should be compared to thresholds for referral for enforcement and referred as appropriate.

C. Calculate the total value impact.

1. The total value impact is needed for comparison to thresholds for referral for enforcement.

2. The total value impact is a manual ratio calculation projecting the value of the sample errors to the universe. See the Sample Results – Value Impact section of the sampling plans in Appendix IV for detailed calculations.

D. Determine the impact on other years or areas.

1. Auditors should consider the impact of their sample results on other universes, such as other years or areas.

2. Generally, projections of sample results should be limited to the universe from which the sample was drawn. Items examined in one universe may not be representative of other universes and projecting to other universes would not statistically defensible. However, auditors may express their opinion and make nonstatistical applications if they believe the results apply to another universe.

VI. DOCUMENT THE SAMPLE RESULTS EVALUATION

A. Audit documentation must fully and clearly document all aspects of the sampling that was used. This documentation must be prepared for each sample (nonstatistical and statistical) and must comply with audit documentation policies.

B. The following sample results evaluation items should be included for each sample:

1. A sampling plan that documents the sample results evaluation must be included. Standard sampling plan forms for this purpose are contained in Appendix IV. The sections labeled Sample Results – Errors, Sample

Results – Compliance, Sample Results – Duty Due, Sample Results – Value Impact, and Sample Results – Other Years/Areas pertain to sample results evaluation. These sections should be completed at this point.

2. The determination of compliance and how calculated.

3. The total revenue due and its method of calculation. This would include the EZ-Quant input and output if statistical projections are used.

4. The calculation and analysis of the resulting precision percentage and any actions taken for unacceptable precision must be included.

5. The total value impact, how calculated, comparison with thresholds for referral for enforcement, and referral for enforcement if applicable.

6. The impact on other years/areas and how determined.

7. Any other documentation produced during the sample results evaluation should be included as appropriate.

VII. REPORT THE SAMPLE RESULTS

A. A table of sampling information will be included in the audit report for each sample (nonstatistical and statistical) if the sample significantly supports the audit findings. The table will show the sample review area, frame description, sampling approach, why the sampling was chosen, frame size/value/duty, and sample size/value/duty. A table will be used for each statistical sample.

B. The tables will be used for all samples in the Assessment Compliance Testing phase of the Focused Assessment (FA). The tables will be used for the Pre-Assessment Survey (PAS) phase of the FA only if the sample in the PAS included the entire universe because the universe was small. Although sampling tables will not normally be included in PAS reports, the sampling plans in Appendix IV will be developed for all samples, including judgmental samples such as those taken in the PAS audit process and will be included in audit documentation. See Appendix IV for sampling plans and see Appendix V for examples of the tables for audit reports.

C. In addition, the audit reports should include any computed compliance rates and total revenue loss computed.