Understanding Attribute Acceptance Sampling including Z1.4 and c=0 Plans

Date: January 19, 2012
Time: 1 pm Eastern time
Duration: 75 Minutes
Cost: Live: $150.00, Corporate live: $300.00

Webinar Course No. 500. This training provides a solid understanding of attribute acceptance sampling by explaining its statistical basis and the two common approaches in use, Z1.4 and c=0 (often called ZBA) plans. You will learn how to quantify the risks associated with sampling, understand costs, and appreciate some important points on the operating characteristic (OC) curve.

Learning objectives. The quality professional today needs to understand the basis of sampling plans to help select the right one for the application. An incorrect choice can increase cost and increase risk at the same time. With the balance of cost and risk in mind, participants will learn how the various plans work. They will learn the basis for sampling costs and the factors that affect them. Moreover, the plans, through the OC curve, allow the quality professional to quantify risk. The participant will learn the options available and how to balance risk and cost when setting up a sampling plan.

Course Benefits. Acceptance sampling is a valuable tool often used (and misused) in the manufacturing sector. The most common methods employ standards so you can look up a sampling plan. The user has many choices, and needs to understand their impact on cost and risk. This seminar explains how to apply Z1.4 and c=0 plans.

Level. Intermediate

Description. This course provides the attendees with the tools needed to understand and implement acceptance sampling. We explain the basis for sampling plans, the binomial distribution, and show how it helps us understand the sampling plan’s performance using the operating characteristic (OC) curve. Participants will gain a solid understanding of how the OC curve is built, how to use it, and how to identify some of the most important points on the curve, including the AQL and RQL points. The course also provides complete descriptions of three other important curves that help you understand a sampling plan. The average sample number (ASN) helps you predict the number of samples you will take. The average outgoing quality (AOQ) helps you foresee the results if you inspect rejected lots. The average total inspected (ATI) helps you calculate how many items you will inspect including rejected lots. Users of Z1.4 will want to understand how to set up sampling and select parameters such as AQL and Level. The course provides a complete description of Z1.4, showing the process from receiving the lot to selecting the sample size to making the accept/reject decision. We will discuss the following issues:
• How to use the sampling tables to determine the sampling plan
• Ways to avoid common errors and misunderstandings with the sampling tables
• The difference between single, double, and multiple sampling plans
• Why double sampling plans are the most economical choice
• The reasons for the switching rules between normal, reduced, and tightened
• The use of the switching rules to help improve your supplier management program
• How the switching rules can help you reduce inspection cost

The c=0 plans are very popular, since they are based on the notion that everything in the sample should pass inspection. The course examines these plans using the curves described above. The OC curve, in these plans, has a different shape that can lead to problems. We will discuss the following issues:
• How to use the c=0 plans instead of Z1.4 plans
Areas Covered in the Seminar

Sampling concepts
  o With or without replacement
  o Simple or stratified sampling

The binomial distribution
  o Possible outcomes and Bernoulli trials
  o The binomial formula and what it means
  o The cumulative binomial

Sampling plans
  o The AQL concept
  o The ideal OC curve
  o The practical OC curve
  o Reading risk off the OC curve
  o Special points on the practical OC curve
    The AQL point
    The IQL point
    The RQL point

Characterizing sampling plans
  o Using rectifying inspection
  o The four important curves
    The OC curve
    The ASN curve
    The AOQ curve
    The ATI curve

Z1.4 Plans
  o Setting up the plan
    Selecting the Level
    Selecting the AQL
    Knowing the lot size
  o Selecting single, double, or normal plans

Single sample plans
  o Cost analysis for single v. double plans
  o Switching rules
    When to switch
    Why reduced inspection lowers cost
    How tightened inspection can help improve supplier performance

c=0 plans
  o How they are matched to Z1.4 plans
    The RQL point is the key
    Making the curves cross at one point
    How to employ switching rules
  o The OC curve
    It is not the ideal curve
    The difference in shape and the problems it causes
  o Consequences of moving from Z1.4 to c=0
    Inventory management and stock-outs
    Supplier management and performance metrics

Related Technical Documents

ANSI/ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes
Zero Acceptance Number Sampling Plans by Squeglia

About the Instructor: Dan O’Leary has more than 30 years experience in quality, operations, and program management in regulated industries including aviation, defense, medical devices, and clinical labs. He has a Masters Degree in Mathematics, focusing on logic and number theory. His professional experience relates to quality, reliability, and operations management. Dan is a regular speaker at international conferences including ASQ, ISM, and RAMS. Dan teaches courses in reliability methods, medical device regulations and practices, statistical methods, management systems (ISO 9001 & ISO 14001), and project management. Dan is a member of the American Mathematical Society, American Statistical Association, Society of Industrial and Applied Mathematicians, Institute for Supply Management, Project management institute, APICS, and is a Senior Member of the American Society for Quality and has
held leadership positions in ASQ sections. He is an ASQ Certified Biomedical Auditor, Quality Auditor, Quality Engineer, Reliability Engineer, and Six Sigma Black Belt; and is also certified by APICS in Resource Management.

Who Should Attend?
Target Audience: This seminar is designed for people in manufacturing who are involved in setting product specifications, setting up acceptance plans, performing acceptance activities, and supply chain management. Attendees should have knowledge of manufacturing process that includes acceptance activities such as incoming, in-process, and final acceptance. This typically includes: Quality Engineers, Production and Process Engineers, Manufacturing Engineers, Design Engineers, Purchasing Managers, Purchasing Agents, Supplier Quality Engineers, Quality Supervisors, Quality Inspectors, and Quality Managers.

Why you should attend. Imagine this! Your company uses acceptance sampling in your manufacturing process and your manager asked to make sure it is cost effective. She also knows there is some risk associated with sampling, but she admits she doesn’t completely understand it. You now have a new assignment; assure your manager that you have good balance between risk and cost. The person who set up the system retired a few years ago and isn’t available to help. You have also heard about some new methods called c=0 or zero based acceptance.
• How do you know how much your inspection system costs?
• Are you inspecting too much, and wasting money?
• Are you inspecting too little and incurring risk?
• Do your current managers and supervisors understand how the system works?
• Will your ISO 9001 registrar ask for justification of these statistical methods?
• Should you start to use these c=0 plans you have heard about?
• Can you improve the process?

For More questions: Contact the Training Administrator, E-mail: info@qpsinc.com, or Telephone:1-877-987-3801