Reduce Inspection Costs with Sequential Sampling in ANSI/ASQ Z1.4

Description: Sequential sampling, in which the sample size is one, minimizes the average sample number (ASN) necessary to reach a decision as to whether to accept or reject a lot. This, in turn, minimizes the mandatory but non-value-adding inspection activity. This webinar will show how to translate an ANSI/ASQ Z1.4 sample plan into a sequential plan for normal and tightened inspection. (It is also possible to do this for reduced inspection, but the administrative complexity is greater and the benefits fewer.) The sequential plan provides comparable protection against poor quality as shown by its operating characteristic (OC) curve.

Objectives of the Presentation:

- Understand the selection and definition of the traditional ANSI/ASQ Z1.4 plan in terms of the sample size n and acceptance number c
- Know how these specifications translate into the operating characteristic (OC) curve, which plots the chance of accepting the lot versus the nonconforming fraction (p). A lot at the acceptable quality level (AQL) has roughly a 5% chance of rejection (alpha or producer's risk). While these plans do not have rejectable quality levels (RQL), we can pretend that the RQL is the nonconforming fraction at which the chance of acceptance (beta or consumer's risk) is 10%
- Know how to define a sequential sampling plan on the basis of the two points (AQL, alpha) and (RQL, beta), and how to present the plan in a very convenient table
- Calculate the OC curve for the sequential plan and show that it is almost identical to that of the original ANSI/ASQ Z1.4 plan. It is in fact exactly identical by design at (AQL, alpha) and (RQL, beta)
- Calculate the average sample number (ASN) as a function of the nonconforming fraction. This will be far less than that of the single sample size, substantially less than that of the double sample plan, and somewhat less (especially for poor quality lots) for even the multiple sample plan. Use this information to truncate the sequential plan to eliminate the theoretical possibility of endless sampling
- Apply ANSI/ASQ Z1.4's switching rules between normal, tightened, and reduced inspection

Why Should you Attend:

All processes constitute (1) transformation of the product, (2) handling and setup, (3) inspections and decisions regarding the product, (4) transportation, and (5) waiting. None of these are value-adding except for transportation. Inspection is necessary or even mandatory, but we can realize cost savings by minimizing the amount necessary to provide the specified level of protection to the customer. Sequential sampling is the ultimate extension of the double and multiple sampling plans in ANSI/ASQ Z1.4.

Who can Benefit:

- Quality managers, engineers, and technicians
- All manufacturing industries that use ANSI/ASQ Z1.4

Topic Background:

ANSI/ASQ Z1.4 is a commonly and widely used specification for acceptance sampling based on attributes (specifically conforming versus nonconforming). Its double and multiple sampling plans, which are designed to accept good lots very quickly and reject bad lots very quickly, are intended to reduce the amount of mandatory but non-value-adding inspection that must be performed. Sequential sampling takes this concept even further by inspecting successive items (samples of 1) to reach a decision.

Contents:

- Specification and selection of an ANSI/ASQ Z1.4 sampling plan
- The operating characteristic curve, and the points (AQL, 1-alpha) and (RQL, beta) where the second item is the chance of acceptance. (An ANSI/ASQ Z1.4 plan does not have a specified RQL, but we must determine one based on beta = 0.10, which is tabulated in the standard, so we can create the sequential plan)
- Determination and tabulation, in a very convenient format, of a sequential sampling plan
- Demonstration that the sequential plan provides comparable protection from poor quality, and in fact identical protection at (RQL, beta)
- Average sample number (ASN), the number of items we expect to have to inspect to decide whether to accept or reject the lot
- Application of the ANSI/ASQ Z1.4 switching rules

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