



ASQ CRE Prep course

Lesson II. A. 7. e.

SPC and Process Capability

Attribute Charts

A wide-angle photograph of a rugged coastline. The foreground is filled with dark, mossy rocks of various sizes. Waves are crashing against these rocks, creating white foam and spray. The ocean extends to the horizon under a clear, light blue sky.

Counts and proportions

ATTRIBUTE DATA

Charts for Defectives

p Chart – %defective

p = fraction defective in a sample

\bar{p} = average fraction defective

$$\bar{n} = \frac{\sum n_i}{k}; \bar{p} = \frac{\sum np}{\sum n}$$

$$UCL_p = \bar{p} + 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

$$LCL_p = \bar{p} - 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

np Chart – # defective

n = number of units in a sample

k = number of samples

$$UCL_{np} = n\bar{p} + 3\sqrt{n\bar{p}(1-n\bar{p})}$$

$$LCL_{np} = n\bar{p} - 3\sqrt{n\bar{p}(1-n\bar{p})}$$

Binomial Distribution

Charts for Defects

u Chart – average # defects

c = number of defects

u = average defects / unit

$$u = \frac{c}{n}$$

$$UCL_u = \bar{u} + 3\sqrt{\frac{\bar{u}}{n}}$$

$$LCL_u = \bar{u} - 3\sqrt{\frac{\bar{u}}{n}}$$

c Chart – # defects / unit

n = number of units in a sample

$$UCL_c = \bar{c} + 3\sqrt{\bar{c}}$$

$$LCL_c = \bar{c} - 3\sqrt{\bar{c}}$$

Poisson Distribution

Could you only
use p charts?



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The Analysis