ASQ CRE Prep course

Lesson II. A. 7. e.

SPC and Process Capability

Attribute Charts

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

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

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

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

c Chart – # defects / unit

$n =$ number of units in a sample

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

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

Poisson Distribution

Could you only use p charts?

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SPC and Process Capability

The Analysis