

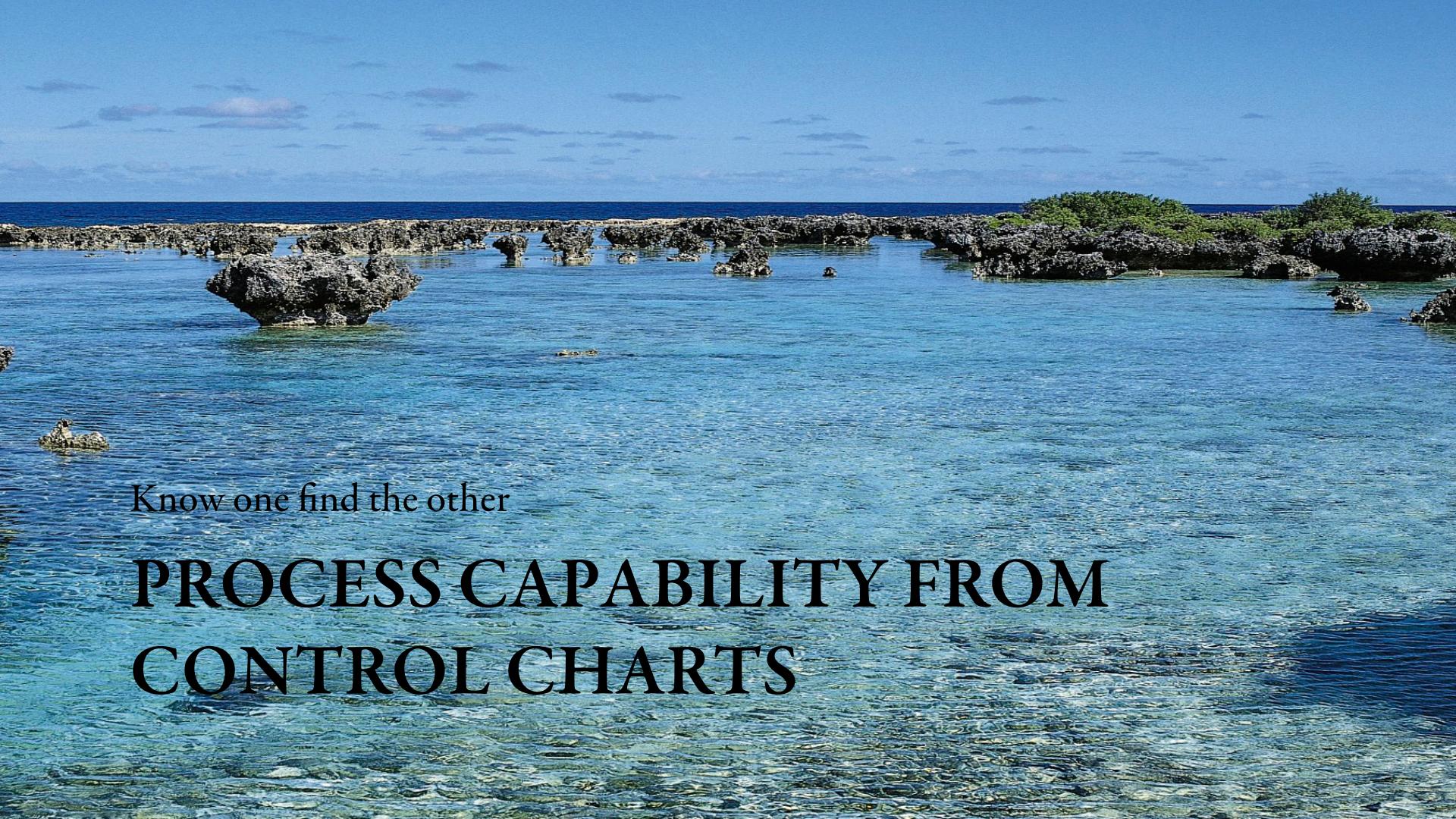


ASQ CRE Prep course

Lesson II. A. 7. i.

SPC and Process Capability

Capability and Charts

A wide-angle photograph of a tropical coral reef. The water is a vibrant turquoise color, with sunlight filtering through the shallow water. In the foreground, there are several large, dark, irregular rock formations, likely coral rubble. In the middle ground, a small, low-lying island with dense green vegetation is visible. The background shows a clear blue sky with a few wispy white clouds. The overall scene is peaceful and natural.

Know one find the other

PROCESS CAPABILITY FROM CONTROL CHARTS

From a Control Chart

- An estimate of standard deviation
- Given and average R
- And, number in draws
- we can estimate standard deviation

$$\hat{\sigma} = \frac{\bar{R}}{d_2}$$

**d_2 is a factor to convert a average range
To a standard deviation
Find the values for each n on page III-78**

Another Way to Find Standard Deviation

- You can also use the factor A_2

$$A_2 \bar{R} = 3s_{\bar{x}}$$

- This is for standard error of the mean and needs another step

$$s_{\bar{x}} = \frac{s_x}{\sqrt{n}}$$

$$s_x = s_{\bar{x}} \sqrt{n}$$

Then Use Normal Table

- We can then calculate Cp, Cpk or percentage outside specification limits

$$Z_{upper} = \frac{USL - \bar{X}}{\hat{\sigma}}$$

$$Z_{lower} = \frac{\bar{X} - LSL}{\hat{\sigma}}$$

$$\% \text{Outside Limits} = P[Z_{upper}] + P[Z_{lower}]$$

Does the design
team have the
SPC data?



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Pre-Control Charts