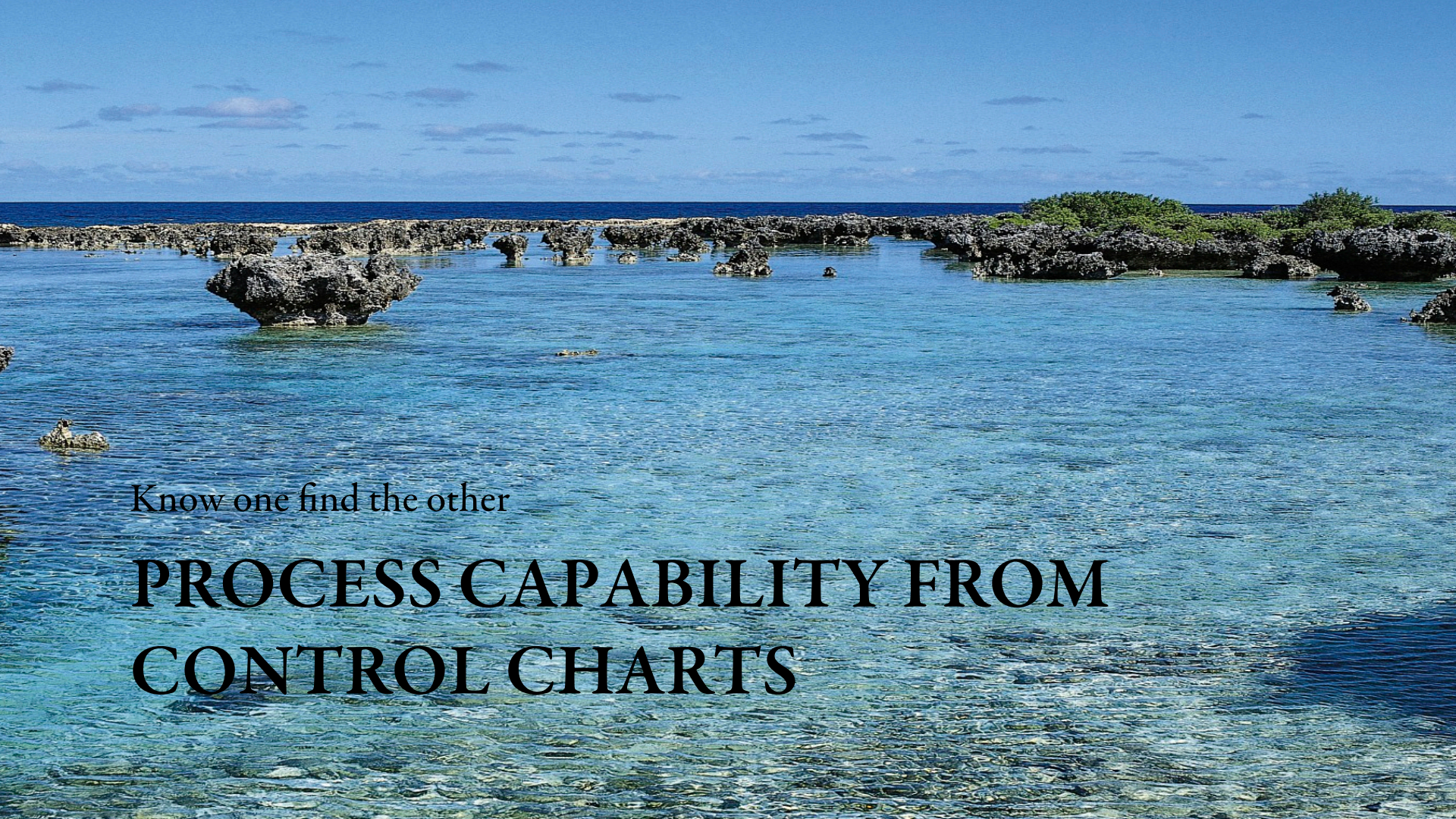
ASQ CRE Prep course

Lesson II. A. 7. i.

SPC and Process Capability

Capability and Charts



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**

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

Then Use Normal Table

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

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

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

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

Does the design team have the SPC data?

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Pre-Control Charts