Process Capability

What is Process Capability?

- Measure of the variability of a process
- If a process is capable, it is stable and doing what it should
- Mainly used in manufacturing

Components of Process Capability

Control Width

- Something you calculate

Spec Limit

- Something provided to you
  - Physical limitation
  - Tolerance of customer
  - Tolerance of manager
  - Tolerance of downstream need

Your Goal

- Determine how the control width matches up with the spec width

Process Capability Formula

- USL – Upper Spec Limit
- LSL – Lower Spec Limit
- UCL – Upper Control Limit
- LCL – Lower Control Limit

$$C_p = \frac{USL - LSL}{UCL - LCL}$$

$$C_p = \frac{USL - LSL}{6\sigma}$$

Interpreting Process Potential (Cp)

- Not Capable: < 1
- Marginally Capable: 1 – 1.32
- Fully Capable: > 1.33

Upper and Lower Process Capability

Upper Process Capability

$$C_{pu} = \frac{USL - \mu}{3\sigma}$$

Lower Process Capability

$$C_{pl} = \frac{\mu - LSL}{3\sigma}$$

Cpk

- Of Cpu and Cpl, take whichever is smaller!