Measurement Systems Analysis Course Outline

MEASUREMENT SYSTEM ANALYSIS

Lesson 1 | Variation in Measurement Systems

- A review of sources of measurement system variation.
- An explanation of Type A and Type B evaluations of measurement uncertainty.
- Exploration of the effects of too much variation on measurements.

Lesson 2 | Measurement System Linearity

- How to measure gage/instrument linearity (both graphically and mathematically) to determine if a gage (or instrument) has linearity problems.
- Taking action to deal with linearity problems.

Lesson 3 | Measurement System Stability

- How to evaluate gage/instrument stability using a control chart. Taking action to deal with stability problems.

Lesson 4 | Repeatability & Reproducibility

- How to conduct a GR&R study.
- R&R analysis for non-destructive measurements.
- Use of ANOVA for GR&Rs.
- R&R analysis for destructive measurements.
- R&R analysis for attribute measurements.
- Graphical techniques to analyze R&R.

Lesson 5 | Improving Measurement Systems

- Using a problem-solving approach to find the root causes of repeatability and reproducibility problems.
- Using the GR&R data to help direct the problem-solving effort.
- A description of some basic causes to investigate if gage/instrument repeatability is high.
- A description of some basic causes to investigate if appraiser reproducibility is high.

Lesson 6 | MSA Software Considerations

- Suggested selection criteria for features of software programs for analyzing GR&R studies.
- An overview of some of the advanced measurement system analysis tools that a GR&R software package may have.

Challenge

- An assessment of the learner's progress in this Unit.