

SPC consulting group

MSA

MEASUREMENT SYSTEM ANALYSIS

Objective:
The participant will know the different studies carried out on variable data and attribute data measurement systems, will be able to apply statistical methods for its analysis and interpretation, and will recognize the importance of having reliable measurement systems

Prerequisites:
- Basic knowledge of IATF 16949:2016 (desirable)
- Experience in manufacturing environments
- Knowledge of the products and processes in your organization
- Laptop with Minitab software

Duration:
16 hours

MSA – Measurement System Analysis (4th Edition)

Introduction
- Importance of MSA
- Relation to IATF 16949:2016
- When MSA is required?
- Who is responsible for MSA?

Concepts and definitions

Basics Statistics
- Central tendency measures
- Measures of dispersion

Resolution
- Required resolution calculation
- Selection of the measuring instrument

Variation in measuremnt systems
- Effects on the measurement of products
- Effects on the measuremnts of processes

Accuracy vs Precision

Bias Study
- Practical exercise
- Minitab – BIAS Study
- Causes of excessive bias

Linearity Study
- Practical exercise
- Minitab – Linearity Study
- Causes for linearity error

Stability Study
- Practical exercise
- Minitab – Control Charts
- Causes of instability

Gage R&R Study - Repeatability and Reproducibility
- Practical exercise
- Average and range method
- ANOVA method
- Minitab – Crossed Gage R&R
- Results interpretation
- NDC – Number of Distinct Characteristics
- Corrective actions

Attribute Measurement Systems Study
- Practical exercise
- Kappa index
- Crosstabulation
- Effectiveness of the measurement system
- Miss rate, false alarm date
- Minitab - Attribute agreement analysis
- Corrective actions