



SINGAPORE QUALITY INSTITUTE

66 Tannery Lane #06-07 Sindo Building Singapore 347805
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ROS Ref No: ROS 245/1970 TAP GST Reg No: M90010688N

MEASUREMENT SYSTEM – GR&R STUDIES

Introduction

GR&R Studies is a method for evaluating and quantifying an existing gauge or inspection system. It determines if an inspection method or equipment produce acceptable, marginal or unacceptable results. It is often taken for granted that inspection results are true values with no errors. In reality, all inspection or gauge results are subject to variation. *It is a required component for calculating process validation, and the acceptability level for a production process.*

Application of Gage Repeatability and Reproducibility (GR&R) Studies can give rise to the following benefits:

- A criterion to accept new measuring equipment.
- A comparison of one measuring equipment against another.
- **A basis for evaluating a gauge suspected of being deficient.**
- A comparison for measuring equipment before and after repair
- Assess the impact of GR&R on Process Capability Studies.

Course Outline

Day 1: 9:00AM – 05:00PM

1. Main Concept of Measurement System
 - Measurement System
 - Measurement / Tolerance
 - Process In-Control
 - Measurement System Analysis
 - Gauge Capability Studies
2. Computation Techniques Associated with GR&R
 - Standard Deviation / Rbar / d_2 / Ro / d_2
3. Types of Measurement System Variation
 - Bias / Repeatability / Reproducibility / Stability / Linearity
4. Repeatability & Reproducibility (R&R) / Gage Capability
 - Computation of Combined GR&R using individual R & R Values
 - Computation of Combined GR&R using Quick Approximation Method
5. Procedure For Determining GR&R & % GR&R

Day 2: 09:00AM – 05:00PM

6. Computation of %GR&R & Its Interpretation During Application
 - Calculation of GR&R
 - Process Variation
 - Percent of Tolerance
7. Use of GR&R Data Sheet & GR&R Report Format
 - GR&R Data Sheet
 - GR&R Report Format
8. Practical Method for Reducing Unacceptable GR&R Result
 - Six Sigma Spread
 - Determination of GR&R Reduction Percentage



Certificate No: 6655731205

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9. Impact of GR&R on Process Capability Studies
 - Process Capability Studies coupled with GR&R
 - Process Capability Studies with reduced GR&R
10. Application of Calibration Techniques In Measurement System
 - Physical Calibration
 - Comparative Techniques
 - Inter-laboratory Comparisons
11. Class-room Assignment & Exercises.

Who Should Attend

This course is particularly suitable for and benefit to Engineers, Supervisors, Process Specialists or any personnel involved in quality assurance, process control and continual improvement activities.

Award of Certificate

Certificate of Attendance will be issued to participants who have attended at least 75% of the course.

Course Duration (9.00 am – 5.00 pm)

2-Days

Course Fees

S\$ 449.40 (For SQI Member), S\$ 481.50 (For Non-Member)
Course fees include 7% GST, training materials and certificates.

Training Venue

Singapore Quality Institute (SQI), 66 Tannery Lane #04-04 Sindo Building Singapore 347805

We also provide customized in-house training starting from S\$2,000 per day. Please contact us for more information on our products and services.

Singapore Quality Institute (SQI)

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