

## STATISTICAL PROCESS CONTROL (SPC)

### *Introduction:*

Statistical process control (SPC) is widely accepted tools to control and assure process and product quality meet customer's requirements. With proper implementation and execution, this tool allows an organization to effectively and efficiently maintain the desired quality level. In addition, this is a mandatory measurement analysis technique in the automotive standard IATF 16949: 2016.

### *Course Objectives:*

This course covers the basic statistical applications for process control. Upon completion of the course, participants will be able to:

- Understand the principle and concept of Accepting Sampling and SPC, and correctly apply for use in their own working environment.
- Understand the concept and the role of SPC in Quality Management System and to develop effective SPC through the control chart techniques.
- Apply statistical evaluation methods to determine the sources of variations.
- Know how to use Minitab software as a tool in analyzing data
- Assure and maintain the desired process and product quality level at the most effective and yet efficient manner.

### *Course Contents:*

#### **1.0 Quality Philosophy and Fundamentals**

1.1 Evolution of Quality and Quality Concepts

1.2 Review of various Quality Improvement tools and application area

1.3 Measurement of Quality; Prevention Costs, Appraisal Costs, Internal Failure Costs and External Failure Costs

#### **2.0 Basic Statistics for Quality Control, Assurance and Improvements**

2.1 Understanding Variation

2.2 Population and Sample

2.3 Measure of Location

2.4 Measure of Dispersion

2.5 Tests for Normality

#### **3.0 Statistics Process Control**

3.1 Fundamental and Concept

3.2 Analysis and interpretation of Patterns (Trends) in Control Chart

3.3 Steps in Control Chart Setup

3.4 Types of Attribute Control Charts (n, np, c, u) and application area

3.5 Types of Variable Control Charts(Average and Range, Moving Range and Z-Scores) for High Volume Production and Low Volume and Mixed Production

3.6 Regression Control Chart

3.7 Finding sample size and sampling frequency for Control Chart

#### **4.0 Process Capability**

4.1 Introduction to Process Capability and Benefits

4.2 Steps involved in a capability study

4.3 Calculate Short term and Long term Process Capability, Cp, Process Capability, Cpk and Process Capability –to- target, Cpm

4.4. Interpreting Defective level from Process Capability

4.5 Calculate Process Capability in Non-Normal Distribution

4.6 Detecting shift and variation through Process Capability Study

#### ***Training Methodology:***

Combination of lecture, with practical/hands-on approach such as exercises, case studies, application, presentation and group discussion.

#### ***Who Should Attend:***

This course is designed for Process Engineers, Quality Engineers, Managers and Supervisors who are using or intend to use SPC techniques in their work for process control and improvement. It is also beneficial for those in engineering or management functions who required to have a good understanding of the SPC concepts as well as for any individual who are responsible for planning, developing or managing a quality system to satisfy the ISO 9001 or IATF 16949 quality system requirements.

#### ***Award of Certificate:***

Participants will be issued with a Certificate of Successful Completion upon meeting 75% of the required course attendance.

#### ***Duration:***

2 days (14 hours)

#### ***Course Fee:***

\$600 nett per trainee (GST is not applicable).

(Course fee is inclusive of all training materials and light refreshments.)