

Statistical Process Control (SPC Workshop)

Establish Statistical Process Control (SPC) in your company and Improve your process right way!

Statistical Process Control (SPC) is an effective method of monitoring a process through the use of control charts. By collecting readily available data from samples, variations in the process that may affect the quality of the end product or service can be detected and corrected before any waste is produced. This method has a distinct advantage over more traditional quality methods such as inspection, as resource is used for prevention rather than detection. This has clear implication for businesses, as valuable resources are prevented from being used to defective products or to provide poor services.

Workshop Objectives

- Analyze metrics data to achieve process improvement Organization
- Identify the right analysis tool to suit the available data
- Get an understanding of process performance models
- Tailor metrics system to suit emerging needs in the organization
- Understand DOE (Design of Experiments)
- Apply SPC methods to improve processes
- Achieve process optimization

Target Audience

- Quality Management Professionals in IT (SQA, PQA and Quality Managers)
- Process executives and Managers

Benefiting Members

- SEPG Members
- Six Sigma Green Belts and Black Belts
- Project Managers who wish to apply SPC

Pre-requisites

The participants are requested to refresh their knowledge on basic statistics and statistical function in MS Excel before attending the workshop.

Duration: 3 days

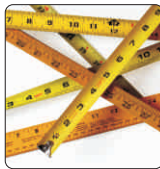
Session 1: Introduction (0.5 Hour)

- History Of SPC
- Challenges Of Applying SPC to Software Development
- Essential Elements Of SPC



Session 2: Data (2 Hours)

- Data Collection
- Sampling
- Measurement System
- Measurement Capability



Session 3: Software Metrics (2 Hours)

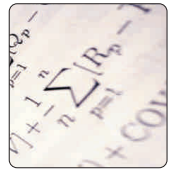
- Napping
- Metrics Definitions
- Span And Depth
- Flexible Plans
- Optimum Metrics
- Metrics Database



DAY - 1

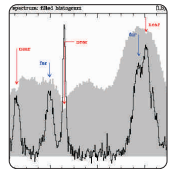
Session 4: Descriptive Statistics (1 Hour)

- Statistic
- Parameter
- Summary Statistic
- Central Limit Theorem
- Standard Error



Session 5: Box Plot & Histogram (2 Hours)

- Percentiles
- Box Plot Construction
- Box Plot Interpretation
- Histogram
- Histogram Construction
- Types of Histogram
- Histogram Interpretation



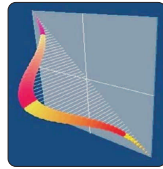
Session 6: Metrics Dashboard (0.5 Hour)

- Dashboard Elements
- Business Graphs
- Choosing Indicators
- Message Design



Session 1: Normal Distribution (2 Hours)

- Binomial Distribution
- Normal Distribution
- Cumulative Distribution Tails
- Inverse Calculations
- Confidence Intervals



Session 2: Engineering Distributions (2 Hours)

- Weibull Distribution
- Deriving Weibull Parameters
- Applying Weibull Distribution
- Extreme Value Distribution
- Applying Extreme Value Distribution
- Useful Engineering Distribution



Session 3: Stastical Distributions (1 Hour)

- Z Distribution
- t Distribution
- Chi -Square Distribution
- F Distribution



Session 4: Stastical Tests (1 Hour)

- Hypothesis Testing
- Significance Level
- Confidence Level
- P Value
- Z Test
- T Test
- Chi-square Test
- F Test



Session 5: Process Capability Indices (2 Hours)

- Variation Reduction
- Cp
- Targeting
- Cpk
- Sigma Level
- Performance Integral



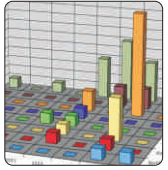
Trainers Profile - Mr C.Ravindranath Pandian

Mr.Pandian has in-depth understanding of Six Sigma-DMAIC & DFSS-DMADV Methodologies, Breakthrough Strategies and the corresponding statistical tools & techniques (both basic & as well as advanced). Guided a large number of Process Excellence Projects (Customer Satisfaction,Process/Product development/optimization, Rejection/rework/waste/cost minimization, Quality/Productivity Improvement etc.) Contributed significantly to the bottom-line of the organizations through steering Six Sigma & other projects successfully

- Six Sigma Master Black Belt and a Six Sigma Trainer
- Has trained and mentored more than 10000 engineering and management professionals on quantitative techniques for process control, improvement and optimization.
- Has integrated analytical methods with statistical methods and strived to create a scientific culture in the work area. Has implemented statistical techniques in the work areas and achieved process innovation.
- Has carried out several improvement projects using 7 QC Tools, Six Sigma , Lean Tools and process capability analysis at the grass root level.
- Has promoted reliability concepts in all spheres of management

Session 1: Process Control Charts (2 Hours)

- Run Chart
- Z Chart
- Individuals Control Chart
- Rational Subgroups
- X-Bar R Chart
- X-Bar S Chart
- XmR Chart
- P Chart
- Np Chart
- C Chart
- U Chart



Session 2: Regression (2 Hours)

- XY Scatter Plots
- Regression Line
- Non Linear Regression
- Correlation Coefficient
- R Squared Value
- Residuals Analysis
- Multiple Linear Regression
- Simulation
- Response Surface
- Natural Experiments



Session 3: Design of Experiments (DOE) (4 Hours)

- Planning Your Experiments
- Steps In Designed Experiments
- Classical Methods
- Full Factorial Designs
- Partial factorial Designs
- Response Surface Methods
- Taguchi Methods
- Robust Design
- Signal To Noise Ratio
- Parameter Design
- Tolerance Design
- One Factor Experiments
- Two Factor Experiments
- Managing Multiple Factor Experiments
- Analysis Of Experimental Results
- Main Effects
- Interactions
- Optimization



SESSION 4: ANALYSIS OF VARIATION(ANOVA)

- One way Anova
- Two way Anova
- Nested and Crossed Anova

