

Statistical Process Control (SPC)

*Statistical Process Control for Quality
Excellence*

A 2-Day Technical Workshop for Engineers & Quality
Teams

Statistical Process Control (SPC)



Why This Workshop Matters

Modern manufacturing environments demand **precision, consistency, and rapid detection** of variation.

Product quality issues escalate quickly — affecting yield, cost, delivery, customer trust, and long-term competitiveness.

This workshop equips participants with the statistical thinking and **SPC tools** needed to:

- Understand where variation comes from
- Detect deviations with control charts
- Stabilize processes before defects occur
- Improve capability indices (C_p , C_{pk})
- Reduce cost of quality and rework
- Strengthen organization-wide quality performance



Training Needs We Address

Based on industry challenges, the workshop helps solves

Unstable processes that produce inconsistent result

Weak understanding of capability metrics (C_p , C_{pk} , DPM)

Ineffective or outdated control chart practices

Lack of skills to revise control limits properly

Inability to differentiate common vs. special cause variation

Difficulty identifying root causes of process instability

Incorrect or manual calculation of control limits

Inconsistent documentation of SPC findings



Target Audience

Engineers (Process, Manufacturing,
Equipment)

Quality & Reliability Engineers

Statisticians & Data Analysts

Technicians

Anyone responsible for implementing SPC or monitoring process performance

Workshop Objectives

Participants will:

01

Understand variation, types of variation & impact on quality

02

Construct control charts for continuous and binomial data

03

Interpret process signals using trend rules and SPC best practices

04

Revise control limits using valid statistical guidelines

05

Perform process stability and capability analysis (C_p , C_{pk})

06

Differentiate stability vs. capability in real-world scenarios

07

Understand SPC roles in production and technology development

08

Develop the skills to implement SPC as part of a factory-wide strategy

What Makes This Workshop **Unique**

A highly practical, industry-backed SPC program incorporating

- Real factory data examples
- Hands-on control chart construction
- Step-by-step capability analysis
- Built-in Excel templates for limits, Cp/Cpk & DPM calculations
- Best-known-methods (BKM) for process stability
- Live demonstrations of 3-sigma logic
- Clear interpretation guides for trend rules
- A complete end-to-end SPC strategy

Participants gain immediately applicable, job-ready SPC skills.



Day 1 Overview

Foundations of Variation, SPC Concepts & Continuous Data Control Charts

1

Module 1: What is Variation?

2

Module 2: SPC /PCS Overview

3

Module 3: Control Charts for Continuous Data

4

Homework #1 (Reinforcement exercise)

Day 1 Key Learning Points

- Sources & types of variation
- Relationship between variation and quality
- SPC fundamentals & process control strategies
- Proper reactions to special vs. common cause variation
- Risks of tampering and ignoring signals
- X-bar, Individuals & Standard Deviation charts
- Screening outliers & computing moving range
- Data requirements for reliable control limits
- Applying trend rules correctly



Day 2 Overview

Binomial Data, Control Limit Revision,
Capability Analysis & PCS Strategy



Module 4: Control Charts for Binomial Data



Module 7: Overall PCS Strategy



Module 5: Control Limits Revision Guidelines



Homework #2



Module 6: Process Stability & Capability
Analyses

Day 2 Key Learning Points

- p-chart fundamentals & minimum data requirements
- Trend rules BKM for binomial charts
- CLSR & OCI indicators for assessing limit validity
- Online vs. offline control limits
- Stability vs. capability
- Cp and Cpk interpretation
- Cpk \leftrightarrow DPM relationships
- Actual vs. estimated OOS
- PCS roles in factory & technology development teams



Methodology

Participants learn through

- 1 Instructor-led presentations
- 2 Hands-on SPC exercises
- 3 Practice with Excel-based control limit calculators
- 4 Structured worksheets & problem-solving activities
- 5 Group discussions and case examples
- 6 Q&A sessions for real-world troubleshooting



Key Takeaways

Participants leave with:

Strong understanding of variation & SPC logic

Ability to construct and interpret multiple control chart types

Skills to revise limits correctly and avoid false signals

Competence in capability analysis (C_p , C_{pk} , DPM)

Knowledge of PCS roles and best practices

Excel calculators for control limits and capability

Confidence in maintaining process stability and quality



Trainer's Profile

With over 28 years of experience in manufacturing, quality, and technical problem-solving, Dr. Chew is recognised as one of the region's top technical trainers.

He has taught professionals from Intel, Hotayi, Stratus Automation, and major multinational companies across Malaysia, U.S., China, Vietnam, and Taiwan.

His facilitation style:

Data-Driven: Simplifying statistical analysis and process control methodologies for real-world business applications.

Decision-Oriented: Equipping professionals with structured problem-solving techniques to enhance decision-making and operational efficiency.

Dynamic: Delivering engaging, hands-on training with case studies, simulations, and interactive learning experiences.

Participants praise his clarity, energy, and ability to simplify complex concepts.



Dr. SK Chew

Applied Statistics/Process
Control System/Problem
Solving Master Trainer

Contact us Now!



+60124001158



www.eliteindigo.com



khenghuat.koay@eliteindigo.com



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