Six Sigma Black Belt

Length: 5 Days

About the Six Sigma Black Belt Course: The Black Belts are required to complete one project such as a Rapid Improvement Event (RIE), Process Development Kaizen, or Value Stream Analysis.

This program focuses its attention on the tools Black Belts will use most often in their events in order to deliver the highest possible ROI.

Our Lean Six Sigma Black Belt course includes several extras such as:

- In-depth study of Lean and Six Sigma and Theory of Constraints tools
- Multiple simulations for real-world practice
- A very comprehensive Capstone exercise

COURSE CONTENT

WHY DO SIX SIGMA

- Definition and Graphical View of Six Sigma
- Overview of Business Applications
- Example Sigma Levels
- Introduction to DPMO and Cost as Metrics
- Comparisons Between Typical TQM and Six Sigma Programs
- Origins and Success Stories

HOW TO DEPLOY SIX SIGMA

- Leadership Responsibilities
- Description of the Roles and Responsibilities
- Resource Allocation
- Data-driven Decision Making
- Organizational Metrics and Dashboards

SIX SIGMA PROJECTS

- Project Focus
- Selecting Projects
- Overview of DMAIC Methodology
- Project Reporting

INCORPORATING VOICE OF THE CUSTOMER

- Goal Posts vs. Kano
- Customer Focus and the Leadership Role
- Overview of QFD
- Customer Data
- Big Y's, Little Y's

DEFINE: PROJECT DEFINITION

- Tasks
- Work Breakdown Structure
- Pareto Diagrams
- Process Maps
- Matrix Diagrams
- Project Charters
- Reporting

DEFINE: PROJECT FINANCIALS

- Quality Cost Classifications
- Quantifying Project Benefits
- Calculations

DEFINE: GOALS AND METRICS

- CTC, CTQ, CTS Parameters
- CTx Flow-down Model (Big Y's, Little Y's)
- Measurement & Feedback
- Calculating Sigma Levels

DEFINE: PROJECT SCHEDULING

- Activity Network Diagram
- PERT Analysis
- GANNT Chart

DEFINE: CHANGE MANAGEMENT/TEAMS

- Problems With Change
- Achieving Buy-in
- Team Formation, Rules, and Responsibilities
- Stages of Team Development
- Overcoming Problems
- Consensus Building
- Affinity Diagram
- Nominal Group Technique
- Prioritization Matrix

MEASURE: TOOLS

- Measure Stage Objectives
- Flowcharts
- Process Maps
- SIPOC
- Box-Whisker Plots
- Cause and Effect Diagrams
- Check Sheets
- Interrelationship Digraph
- Stem and Leaf Plots

MEASURE: ESTABLISHING PROCESS BASELINE

- Enumerative vs. Analytic Statistics
- Process Variation
- Deming's Red Bead
- Benefits of Control Charts
- Requirements vs. Control
- Tampering
- Control Chart Interpretation
- Relative to Process Baseline Estimates

MEASURE: X-Bar Charts

- Uses
- Construction and Calculations
- Assumptions
- Rational Subgroups
- Sampling Considerations
- Interpretation
- Run Test Rules

MEASURE: INDIVIDUALS DATA

- Uses
- Construction and Calculations
- Assumptions
- Sampling Considerations
- Interpretation
- Overview of Other Individuals Charts
- Run Charts
- Moving Average Charts
- EWMA Charts

MEASURE: PROCESS CAPABILITY

- Histograms
- Probability Plots
- Goodness of Fit Tests
- Capability and Performance Indices
- Relative to Process Control
- Interpretation
- Estimating Error

MEASURE: ATTRIBUTE CHARTS

- Uses
- Selection
- Construction and Calculations
- Sampling Considerations

MEASURE: SHORT RUN SPC

- Uses
- Calculations
- Nominals Chart
- Stabilized Chart

MEASURE: MEASUREMENT SYSTEMS ANALYSIS

- Stability Studies
- Linearity Analysis
- R&R Analysis
- Range Method Calculations
- Interpretation
- Using Control Charts
- Destructive Tests
- ANOVA Method

ANALYZE: LEAN THINKING

- Definition of Waste
- Analyzing Process for NVA
- Cycle Efficiencies
- Lead Time and Velocity
- Methods to Increase Velocity
- Standardization
- Optimization
- Spaghetti Diagrams
- 5S
- Level Loading
- Flow
- Setup Reductions

ANALYZE: SOURCES OF VARIATION

- Multi-vari Plots
- Confidence Intervals on Mean
- Confidence Intervals on Percent
- Hypothesis Test on Mean
- Hypothesis Test on Mean of Two Samples
- Power and Sample Size
- Contingency Tables
- Non-parametric Tests

ANALYZE: REGRESSION ANALYSIS

- Scatter Diagrams
- Linear Model
- Interpreting the ANOVA Table
- Confidence and Prediction Limits
- Residuals Analysis
- Overview of Multiple Regression Tools
- DOE vs. Traditional Experiments and Data Mining

ANALYZE: MULTIPLE REGRESSION

- Multivariate Models
- Interaction Plots
- Interpreting ANOVA Tables
- Model Considerations
- Stepwise Regression
- Residuals Analysis

ANALYZE: DOE INTRODUCTION

- Terminology
- DOE vs. Traditional Experiments
- DOE vs. Historical Data
- Design Planning
- Design Specification
- Selecting Responses
- Selecting Factors and Levels
- Complete Factorials
- Fractional Factorials
- Aliasing
- Screening Designs

ANALYZE: DOE ANALYSIS FUNDAMENTALS

- Estimating Effects and Coefficients
- Significance Plots
- Estimating Error
- Extending Designs
- Power of Design
- Lack of Fit
- Tests for Surface Curvature

ANALYZE: DESIGN SELECTION

- Desirable Designs
- Performance
- Balance
- Orthogonality
- Resolution
- Other Design Models
- Saturated Designs
- Plackett Burman Designs
- Johns 3/4 Designs
- Central Composite Designs
- Box Behnken Designs
- Taguchi Designs (Mention)

ANALYZE: TRANSFORMS

- Need for Transformations
- Non-constant Variance
- Box-Cox Transforms
- Calculated Parameters
- Taguchi Signal to Noise Ratios

IMPROVE: TOOLS

- Improve Stage Objectives
- Tools to Prioritize Improvement Opportunities
- Tools to Define New Process Flow
- Lean Tools to Reduce NVA and Achieve Flow
- Tools to Define and Mitigate Failure Modes
- PDPC
- FMECA
- Preventing Failures
- Reference to Tools for Defining New Process Levels

IMPROVE: RESPONSE SURFACE ANALYSIS

- Objectives
- Applications
- Sequential Technique
- Steepest Ascent

IMPROVE: RIDGE ANALYSIS

- Graphical Method
- Analytical Method
- Overlaid Contours
- Desirability Function

IMPROVE: SIMULATIONS

- Applications
- Examples
- Applying Probabilistic Estimates

IMPROVE: EVOLUTIONARY OPERATION

- Methodology
- Example
- Risks and Advantages

CONTROL: TOOLS

- Control Stage Objectives
- Control Plans
- Training
- Measuring Improvement

CONTROL: SERIAL CORRELATION

- Applications
- Estimating Autocorrelation
- Interpreting Autocorrelation
- Batch Control Charts

DESIGN FOR SIX SIGMA OVERVIEW

- Methodology
- Tools for DFSS
- System, Parameter, and Tolerance Designs