Lean Green Belt Training (Complex Problem Solver)

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# Lean Yellow Belt Agenda - You have already covered this or have to complete before Green Belt Training

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<td><strong>Pre Event</strong> - Team Charter - SIPOC - Voice of the Customer - Process Walks - Data Collection - Data Analysis - Process Mapping (Value Stream Mapping) - Setting up a Rapid Improvement Event (1/2 to 1 day) with the team</td>
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<td>- Attributes of a Lean Leader</td>
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# Overview Lean Green Belt (GB) Training

## Goal of the training

**GOAL:** Create **LEAN EXPERTS** who can support organization in embedding culture of Lean-
- Create Complex problem solvers
- Can improve complete Value Streams or service or large process or product (from start to finish)
- Be able to utilize basic statistical knowledge, data analysis skills, team engagement skills, can apply D-M-A-I-C approach, utilize complex Lean tools (Like SMED, Theory of Constraints), have knowledge of FMEA and Control plan
- Can coach Lean Yellow belts and White Belts in leading Rapid Improvement Events and small improvements

## Duration

- 5 business days
- Yellow Belts trained by us only need to take 3 extra days to be certified as Lean Green Belts
- Must complete an improvement project within 6 months of training, show benefits, get approval from QCDMS Consultants and get approved

## Requirements

- Must have attended our 2 days LEAN Yellow Belt Certification
- Maximum 25 people per cohort
- Bring complex problem or a large process to the training
- Trainees has to complete one project (complex problem or medium to large scale process improvement), show substantial improvements and benefits before getting certified.

## What is a Lean Event?

- Form a team, a Project Charter and A3 problem sheet
- Complete pre-work – Understand Process – SIPOC, Spaghetti Diagram, Swim Lane Process Flow diagram, Data Collection, Data Analysis and complete the Current State Value Stream Map
- Lead a Lean Event with the team – Current State map, Find 8 inefficiencies or problems, Prioritize problems, Root cause analysis, find Solutions, create action plan, Create Future state map and targets setting for the future
- Complete Action Items, reap the benefits & sustain

## LEAN GREEN BELT

- Must be a LEAN YELLOW BELT
<table>
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<th>STRATEGIC PLANNING</th>
<th>LEAN &amp; SIX SIGMA BASICS</th>
<th>DEFINE (1 Hour)</th>
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<td>Re-cap of Lean Yellow Belt</td>
<td>Lean Six Sigma</td>
<td>🟢 Lean Project Management</td>
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<td>🟢 List of Problems and Processes brought by Trainees,</td>
<td>🟢 Problem Statement,</td>
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<td>Exercise- Team share their stories things they have observed after Yellow Belt</td>
<td>🟢 Overview of Lean 8 Waste,</td>
<td>Exercise- Look at your problem or process improvement and come out with clear problem statement</td>
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<td>Before Applying DMAIC Principle</td>
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<td>🟢 Complex Project Charter,</td>
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<td>🟢 Examples of Constraints,</td>
<td>Exercise – Group reviews their own Individual Project Charter,</td>
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<td>Strategic Planning - Embedding Lean in Organization and finding opportunities,</td>
<td>Exercise - Trainees share their Constraints as a group,</td>
<td>🟢 GANTT Chart to lead a complex project,</td>
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<td>GANTT Chart to embed Lean in an organization or division</td>
<td>🟢 Overview of Six Sigma,</td>
<td>Exercise – Trainees build their own Project GANTT Chart,</td>
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<td>Exercise- Group creates a plan to embed a culture of Lean in their organization</td>
<td>🟢 Sigma levels and DPMO,</td>
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<td>Project Selection,</td>
<td>🟢 DPO &amp; DPMO,</td>
<td>Exercise – Group exercise and chose a process to complete 3 to 4 SIPOCs in the room</td>
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<td>Exercise- Group exercise to create a Lean Planning sheet</td>
<td>🟢 Data types (Continuous and Attribute),</td>
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<td>Roles and Responsibilities of different stakeholders,</td>
<td>🟢 Central Tendency (Min, Max, Mean, Median, Mode, Percentile / Quartile)</td>
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<td>Exercise – Calculate Central Tendency with the help of Excel</td>
<td>🟢 Critical to Quality,</td>
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<td>🟢 Critical to Delivery,</td>
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<td>🟢 Critical to Cost,</td>
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<td>🟢 Exercise – Draw a histogram in Excel</td>
<td>Exercise- Critical to Quality Exercise for your process or problem.</td>
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<td>🟢 Explaining Variance and Standard Deviation,</td>
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<td>Exercise – Calculate Central Deviation manually</td>
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<td>Exercise – Use Microsoft Excel to do basic statistics</td>
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<td>SIX SIGMA BASICS</td>
<td>🟢 Re-visit Variation and Standard Deviation</td>
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<td>🟢 Process Capability and Process Capability Index</td>
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<td>🟢 Taguchi Loss of Function</td>
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<td>🟢 DMAIC PRINCIPLE</td>
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<td>Day 4 of Lean Green Belt Training</td>
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<td><strong>Data Collection (1.5 hour)</strong></td>
<td><strong>MEASURE (2 Hour)</strong></td>
<td><strong>ANALYZE (0.5 hour)</strong></td>
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<td>❑ Types of Data</td>
<td>❑ Determining Input and Outputs to the process,</td>
<td>❑ Collecting, summarizing and analyzing data in Microsoft Excel,</td>
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<td>❑ Data collection and different methods of data collection,</td>
<td>❑ Understanding, ( Y=f(x) ), Exercise – Complete ( Y=f(x) ) exercise for your own problem or process improvement,</td>
<td>❑ Determine critical inputs,</td>
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<td>❑ Type of Check Sheets-</td>
<td>❑ Utilize SIPOC to find Process Variations,</td>
<td>❑ Perform Data Analysis,</td>
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<td>❑ Concentration Diagram Check sheets,</td>
<td>❑ Attributes and Metrics</td>
<td>❑ Non Value Added Analysis or 8 Types of Waste,</td>
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<td>❑ Frequency plot check sheet,</td>
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<td>❑ Traveler Sheets,</td>
<td>❑ Performance metrics- Leading, Lagging and Process,</td>
<td>❑ Utilize SIPOC Example to analyze data and key variables</td>
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<td>❑ History data (Defects and Cause) Sheet,</td>
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<td>❑ Time and Study Sheet,</td>
<td>❑ Value Stream Mapping – Already covered,</td>
<td>❑ Exercise – Group exercise to analyze a case study to find probable root causes,</td>
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<td>Exercise – Watch a video and learn to do Time and Motion Study,</td>
<td>❑ Exercise – Read through a case study and draw a detailed Value Stream Map,</td>
<td>❑ Group exercise to analyze some process case studies to find probable 8 wastes,</td>
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<td>❑ Capacity Study of Individuals, teams and equipment, Exercise – Review a case study and learn to do capacity study,</td>
<td>❑ Bench marking,</td>
<td>❑ Determine Root Causes,</td>
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<td>❑ Assessing capability and performance of the process,</td>
<td>❑ Complete the Root Cause Analysis and finding probable solutions.</td>
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<td>❑ Process Capability, ( cp ), ( cpk ), ( pp ), ( ppk )</td>
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<td>❑ Baselining key performance measures data (Before Process Improvement),</td>
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<td>❑ Start Monitoring.</td>
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**MEASURE GATE REVIEW**

**ANALYZE TOLL GATE**
# Day 5 of Lean Green Belt Training

## DAY 5 OF TRAINING

<table>
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<tr>
<th>COMPLEX LEAN TOOLS (3 hours)</th>
<th>IMPROVE (2 hour)</th>
<th>CONTROL (1 hour)</th>
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### IMPROVE TOLL GATE
- Share Next Steps,
- Question and Answers.

### CONTROL TOLL GATE
- Open Book Exam
- Share Next Steps,
- Question and Answers.
# Our Lean Tool Kit

## LEAN PRINCIPLES - RESPECT FOR PEOPLE, VISION, VOC, HOSHIN & LEADER STANDARD WORK

### PDCA, COMMUNICATION STRUCTURE, KPI & METRICS

### LEAN EVENTS OR RAPID IMPROVEMENT EVENTS

#### A3 THINKING

1. Problem
2. Form a Team
3. Background
4. Understand Your Current Situation & Data Collection
5. Temporary Solution
6. Root Cause Analysis
7. Finding the Root Cause
8. Solutions
9. Goal Setting & Future Mapping
10. Action Plan
11. Check Effectiveness
12. Sustain

#### LEAN TOOLS

**PROCESS UNDERSTANDING**
- Process Walk
- SIPOC
- Spaghetti
- Swim Lane Process Flow Map
- Value Stream Map
- Time and Motion Studies or Process Studies

**DATA COLLECTION & ANALYSIS TOOLS**
- QC Tools – Bar graph, Histogram, Run Chart, Control Chart, Scatter Diagram
- Pareto Analysis
- Data Analysis skills
- FMEA
- SPC (Statistical Process Control)
- Other data representation or analysis tools as required (Example – Stem & Leaf, Box & Whisker etc.)

**PROBLEM SOLVING**
- 5W 2H
- 5 Whys
- Fishbone Analysis or Cause and Effect or Ishikawa or 5M 1E
- Brainstorming
- Interviewing people who actually do the work
- Inputs Vs. Outputs

**PROCESS STANDARDIZATION**
- 5S
- Standard Work – SOP & Work Instructions
- Visual Management
- Poka Yoke (Mistake Proofing)
- Jidoka or Autonomation
- Skills gap analysis & development

**OTHER KEY LEAN TOOLS**
- Balanced Work
- Heijunka (Levelled Scheduling)
- Kan Ban or Pull System
- Just In Time
- First Pass Yield
- First Time Right
- SMED or Quick Changeover
- Total Preventive Maintenance
- 1 Piece Flow
- Takt Time

- 5S
- Standard Work – SOP & Work Instructions
- Visual Management
- Poka Yoke (Mistake Proofing)
- Overall Equipment Effectiveness
- Andon
- QC Vs. QA (TQM)
- Six Big losses
- SMART Goals
- Work Cell
Learn about Process Improvement Methodology- RIE or Lean

Green Belt Training

Yellow Belt Training

- Problem Definition & Objective
- Integration of Lean into existing efforts and corporate Vision

Process Selection and Assessment with Leadership

Project Charter

- Meeting with Project Sponsor & Project Lead
- Scope
- Team / Stakeholders
- Start Date
- End Date

Pre-work

- SIPOC
- A3 Problem Solving sheet
- White Belt Training
- Data Collection
- Process Walk
- Voice of Customer
- Voice of Employees
- Lean Event logistics

VSM

- Current State VSM
- Inefficiencies
- Prioritizing Inefficiencies
- Root Cause Analysis
- Finding Solutions
- Impact Effort Analysis
- Action Plan
- Metrics or Target Setting
- Future State VSM
- Future State VSM Implementation Plan

Implementation

- Follow detailed Implementation Plan and complete Action Items
- Kaizen Events
- Regular Bi-weekly update Meetings
- Monitor Metrics

Sustain

- Improve Metrics
- Standardize the Process
- Ensure problem does not come back
- Huddle Meetings to continuously monitor metrics
- Complete A3 Problem Solving sheet
- KPIs and Metrics must show improvements

Closure

- Utilizing A3 Problem Solving
- Utilizing other Lean Methodologies and Tools as needed (like 5S, SMED, 1-piece flow etc)
A Lean Organization

How does LEAN organization work?

1. Problems and waste lives in our work
2. Leader engages Staff to share problems
   - Vision, Services & KPIs
   - Communication Structure
   - Skills & Competencies - Lean
   - Coaching Senior, middle management & staff – make improvements
3. Leader & Staff prioritize problems
4. Problem Solving
   A. Daily Problem Solving Or Sectional process reviews
   B. Medium size divisional process review or problem solving
   C. Inter-divisional process reviews or complex problem solving

Legend
- Waste
- Solution

Respect for Individual – Initiative, Equality & Trust
About Charanjit (CJ) Singh Bawa

• Passionate, Results-Driven Professional and Public Speaker
• PMP, Black Belt, Mechanical Engineer (specializing in Automotive)
• 23 Years of Lean six sigma, Change Management & project management experience
• Coached over 4500 employees on Lean White, Yellow, Green Belt trainings and Embedding Lean in complete organization
• Coached more than 150 Improvement project teams
• Huge cost savings and avoidances, improve quality and enhanced morale
• Coached 50 leadership teams to embed Lean
• Industries served – Automotive (OEM- Daewoo & Honda), Auto Parts Manufacturing, Service & Public service
• PMP from PMI USA, Lean Six Sigma Black Belt from ASQ USA & ADKAR change management certified from PROSCI, USA

Services we provide

• Embedding Lean Strategy for complete organization
• Lean White Belt Training (Process or Problems), Yellow Belt Training and Green Belt Training
• Coaching on Lean Events and Rapid Improvement Events
• Other Trainings like Change Management, Hoshin Kanri and Lean Tools trainings as desired by Customers

Our Business Model

• Training & Awareness
• Coaching through experiential Learning (Your Processes)
• Simplified approach for easy learning
• Transfer our knowledge to your team (Speed)
• Creating self reliant teams