

Lean Six Sigma Yellow and Green Belt Training Acronym, Terminology & Equation Sheet

Lean Six Sigma Terminology & Acronyms

Black Belt – Mentors Green Belts in Lean Six Sigma projects or will lead complex cross-functional projects when needed. Normally 4 weeks of training held one week per month.

BV – Business Value

COPQ – Cost of Poor Quality

CPI – Continuous Process Improvement

CTXs – Critical to Variables

DFSS – Design for Six Sigma

DMADV – LSS Methodology (Define, Measure, Analyze, Design and Verify)

DMAIC – LSS Methodology (Define, Measure, Analyze, Improve and Control)

DPMO – Defects Per Million Opportunities

FIFO – First In First Out

FMEA – Failure Modes & Effects Analysis

Green Belt – Leads and facilitates Lean Six Sigma projects and provides training to team members as is needed from time to time.

Implementation Leader - Leads change, provide strategic direction, and coordinates implementation of CPI efforts.

KPI – Key Performance Indicators

LSS – Lean Six Sigma

Master Black Belt – Leads and coordinates Lean Six Sigma Black Belts, Green Belts, and project Sponsors providing the needed guidance for functional, cross-functional projects. And will lead enterprise level projects when called upon to do so. Additional training and projects beyond Black Belt are required for attaining Master Black Belt.

NVA – Non Value Added

POA&M – Plan of Action & Milestones

POUS – Point of Use Systems

RIE – Rapid Improvement Event

ROI – Return on Investment

RPN – Risk Priority Number

SIPOC – Suppliers, Inputs, Process, Outputs and Customers

SMART – Specific, Measurable, Achievable, Relevant and Time Bound

SMED – Single Minute Exchange of Dies

SOP – Standard Operating Procedures

SPC – Statistical Process Control

Sponsor – Owns the process, vision, direction, integration, business results of the process, provides guidance during Toll Gate Review Meetings, and provides the deciding go/no go to continue projects.

Also, provide support & help remove barriers to success.

SWI – Standard Work Instructions

JIT – Just-in-Time

TIMWOOD & U – 8 Wastes (Transportation, Inventory (Excess), Motion, Waiting, Over-Processing, Over-Production, Defects & Under Utilization of Employees)

TOC – Theory of Constraints

TPS – Toyota Production System

TWI – Training Within Industry

WIP – Work in Progress

VA – Value Added

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VOB – Voice of the Business

VOC – Voice of the Customer

VSM – Value Stream Mapping

Yellow Belt - Team members who assist in executing projects/RIEs and with collecting data and sustaining results. Normally one day of orientation training.

5S – process for creating and maintaining an organized workplace (Sort, Set, Shine, Standardize, Sustain)

5S + 1 – 5S with Safety

6S – 5S with Safety

Lean Terms

Business Value – Non-value added work that is required by an unchangeable policy

Constraint – Slowest step of a process; location where inventory piles up; bottleneck.

Cycle Time – Time required to complete a step or a process.

Exit Rate – Amount of work completed over a given period of time.

Flow – The continuous, progressive adding of value in the eyes of the customer.

Gemba – Real place or go see

Heijunka – Even distribution of work to meet takt time (workload balancing)

Jidoka – identification of errors and taking quick countermeasures

Kaizen – Change for the better

Kaizen Blitz – Lightning fast change

Kanban – Visual trigger to synchronize and provide instructions to suppliers and customers

Lead Time – time required to complete an entire process from order to delivery (including wait times).

Muda – Waste (anything that does not add value)

Mura – Waste of Unevenness or Variation

Muri – Waste of Overburden (unnecessary stress to employees and processes)

Non-value added - Waste

Poka-Yoke – Mistake Proofing

Pull System – Process which operates based on customer demand.

Push System – Process which operates based on forecasts or schedules.

Seiri – Sort

Seiton – Simplify or Set

Seiso – Systematic Cleaning or Shine

Seiketsu – Standardize

Shitsuke – Sustain

Takt Time – rate at which a product or service needs to be provided to meet customer demand.

Value Added – The customer wants it (and is willing to pay for it), it changes form, fit or function, and it is done right the first time.

Statistical Terms

LCL – Lower Control Limit

LSL – Lower Specification Limit

Median – the middle of the population or sample

Mode – the most frequently occurring value

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Population (N) – Complete set of items

Population Mean (μ) – average of the population

Population Standard Deviation (σ) – average distance between a point and the mean of the population

Population Variance (σ^2) – average squared distance between a point and the mean of the population

Sample (n) – subset of elements from the population

Sample Mean (\bar{x} , \bar{x}) – average of the sample

Sample Standard Deviation (s) – average distance between a point and the mean of the sample

Sample Variance (s^2) - average squared distance between a point and the mean of the sample

UCL – Upper Control Limit

USL – Upper Specification Limit

Z-score (Z) – probability of data falling under a specific curve

Six Sigma Equations

Mean (Population or Sample)

$$\text{Mean} = \frac{\sum_{i=1}^N x_i}{N} = \mu$$

Population

$$\text{Est. Mean} = \frac{\sum_{i=1}^n x_i}{n} = \bar{X} \text{ or } \hat{\mu}$$

Sample

Variance (Population or Sample)

$$\text{Variance} = \frac{\sum_{i=1}^N (x_i - \mu)^2}{N} = \sigma^2$$

Population

$$\text{Est. Variance} = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n - 1} = s^2 \text{ or } \hat{\sigma}^2$$

Sample

Standard Deviation (Population or Sample)

$$\text{Std. Dev.} = \sqrt{\frac{\sum_{i=1}^N (x_i - \mu)^2}{N}} = \sigma$$

Population

$$\text{Est. Std. Dev.} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n - 1}} = s \text{ or } \hat{\sigma}$$

Sample

Z-Score

$$Z = \frac{X - \bar{X}}{s}$$

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Control Chart

Centerline = Mean

UCL = Mean + 3σ

LCL = Mean - 3σ

Zone C = Mean +/- 1σ

Zone B = Mean +/- 2σ

Zone A = Mean +/- 3σ

Lean Equations

$$\text{Lead Time} = \frac{\text{Work In Process (WIP)}}{\text{Exit Rate (ER)}}$$

$$\text{Takt Time} = \frac{\text{Time available for work in the given time period}}{\text{Customer demand for a given time period}}$$

$$\text{Minimum Staffing} = \frac{\text{Total time of all tasks for all operators}}{\text{Takt Time}}$$