

AALSSSC

American Association for Lean Six Sigma Certification

Lean Six Sigma Yellow Belt Study Guide

Name: _____

Print this guide double sided and bind it for a booklet feel

Letter from the Director

First, let me congratulate you for pursuing your Lean Six Sigma Yellow Belt certification and welcome to the American Association for Lean Six Sigma Certification (AALSSC). Obtaining a Lean Six Sigma certification is one of the most rewarding and valuable professional accomplishments you can achieve. The professional opportunities for a Lean Six Sigma Yellow Belt are vast and apply to all industries. This is an exciting time for Lean Six Sigma professionals and let me be the first to welcome you to the community.

The amount of knowledge required for an AALSSC certification is extensive, but not overwhelming. **You can do it!** The core tenants of AALSSC certifications is they must be relevant and attainable. By only testing the most relevant tools and methods within Lean Six Sigma we have removed some of the knowledge areas deemed not relevant enough – thus making the exam more attainable. As a certified Lean Six Sigma Yellow Belt you are expected to have an awareness of Lean Six Sigma and be capable of contributing to process improvement and problem-solving efforts. The exam tests your knowledge in these focus areas.

This is your study guide, treat it as such. Write your name on it, complete it using your words and follow the concepts outlined. By writing you will retain the information and make this study guide a useful part of your reference library. Plus, this study guide can be used when taking an AALSSC Yellow Belt certification exam.

Good luck and welcome to AALSSC – your road to success.

Erik Christensen

Mr. Erik Christensen, LSSMBB
Director of Certification

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Background

Lean Six Sigma:

- Lean Six Sigma is the combining of two methodologies – Lean and Six Sigma.
- Lean Six Sigma takes advantage of the "value--added" focus of Lean while maintaining statistical tools of Six Sigma.
- Toyota is the company credited with pioneering Lean and Motorola is credited with pioneering Six Sigma.

Yellow Belt skill set (expectations):

- Assist with problem solving
- Assist with process improvement efforts

Quality and Value:

Value: What customers are willing to pay for.

Quality: Meeting or exceeding customer expectations.

Q: How are quality and customer satisfaction related? Who defines quality?

Notes:

Yellow Belt impact is felt strongest with reduction of COPQ

1) Cost of Poor Quality (COPQ) – Costs that would disappear if systems, processes and products were perfect.

Obvious costs: Overtime wages, scraped products, energy, warranty claims, raw materials, etc.

Hidden costs: Reputation, word of mouth, brand value, loss of repeat customer, employee morale, etc.

Notes:

Six Sigma overview

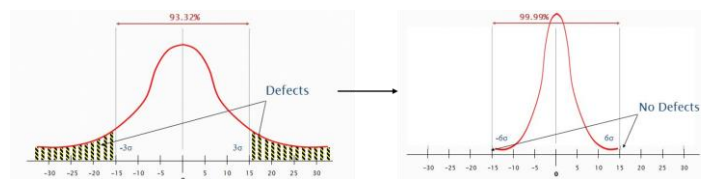
Sigma σ is a statistical unit of measure which reflects process capability

Sigma is mathematical term: Deviation from the mean

6 deviations from the mean – if measuring quality, a six sigma process would only produce 3.4 defects per million opportunities (DPMO)

Follows DMAIC stage gate cycle for project execution.

- Define
- Measure
- Analyze
- Improve
- Control



Focus efforts following the transfer function $Y=f(x)$ – which means the output (Y) is the function of the inputs(x).

Six Sigma's primary objectives is to reduce process variation

Lean Overview

Lean is a systematic approach to identify waste, focus activities on eliminating it, and maximize (or make available) resources to satisfy other requirements.

Lean is term used to describe Toyota Production System (TPS)

Lean fundamentals

- Go/See: Go to the Gemba and see processes first hand
- Ask why: Question assumption, find root causes
- Show respect: Provide employees with a safe, functional work environment

Gemba: The place of actual work.

Kaizen: Continuous Betterment (Improvement).

Q: What actions are managers expected to take based on these concepts? How do these concepts shape organizational culture?

Notes:

TIM WOODS

Concept: Understand value adding vs. non-value adding steps in a process.

- Defined by the customer
- Identify and eliminate waste (TIM WOODS)
- Waste is like a saboteur who is disrupting normal operations

Transportation: Movement of material, information, people or equipment that does not add value

Inventory: More information, projects, material on hand than is needed right now

Motion: Movements of people that does not add value

Waiting: Idle time created when material, information, people, or equipment is not ready

Over-Production: Generating more than is needed right now

Over-Processing: Effort that creates no value from the customer viewpoint

Defects: Work that contains errors, re-work, mistakes or lacks something necessary

Skills: Any failure to use the time and talents of people

WIP: Work in process (not raw material, not finished goods) – form of inventory waste.

Notes:

Principles of Lean

1. Define value from the standpoint of the end customer.
 - Voice of the customer (VOC)
 - Understand who are the customers and what do they value
 - Critical to Quality Tree
 - Convert abstract VOC to measurable attributes

Need	Drivers	CTQ Characterizes
Excellent customer service	Competent reps	90% resolution on 1 st contact
	Friendly reps	Greeted by name
	Short hold times	Hold time NTE 3 min

2. Map the value stream.
3. Create flow by making the steps occur in tight sequence.
4. Let the customers pull value from the process by keeping pace with the rate of customer demand.
5. Continuously improve and strive for the “Ideal” process.



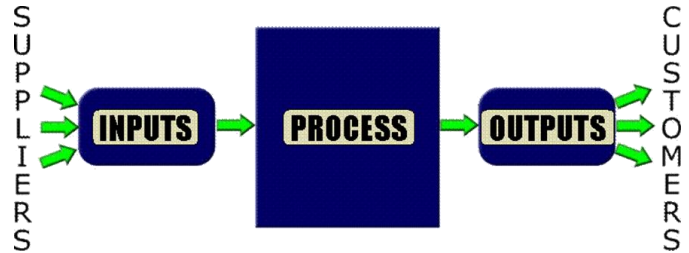
Seeing the Process

Tool: SIPOC – provides project scope.

High level look at project. Prevents scope creep.

Develop in reverse - COPIS

Notes:



Tool: Value stream map – visual display of all the actions taken to bring a product or service to the customer.

Three types:

Current state: How we do it today

Ideal state: Perfect world process

Future state: Target process with less waste

Swim lanes: VSM format that shows movement of process between department

- Value added step: Customer would pay for it, done correctly the first time and changes the form, fit or function
- Non-value added step: Does not meet above criteria
- Business value: Non-value adding steps required for business purposes (Ex. paying taxes, reporting data).

Value Stream and Action Planning

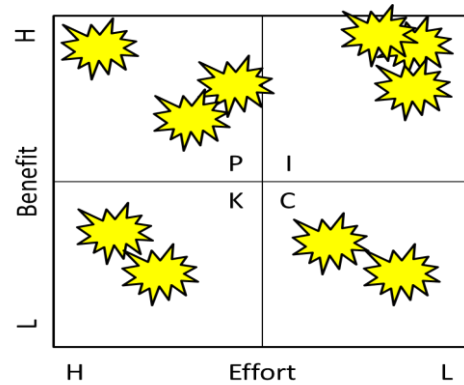
Develop an action plan to document who is going to do what, when.

Concept: To make the change from current state to future state value stream maps people must act. These actions are prioritized and documented on an action plan.

Tool: PICK chart – used to prioritize the action plan.

Possible, Implement, Consider, Kill

Notes:



Tool: Action Plan – identify actions necessary to accomplish goal.

Various formats exist, all accomplish the same objective: Capture the actions necessary to move toward goal accomplishment

Notes:

ACTION PLAN			
WHO	WHAT	WHEN	HOW

Change Management

Improving processes requires people to change how or what they do, any change in work requires some level of change management.

$Q \times A = I$: The quality of the solution multiplied by the *acceptance of the people* who must implement the solution equals the impact of that solution.

Notes:

Problem Solving

Problem solving

Concept: Yellow Belts us a structured problem-solving method:

Any method will work. Just have a method.

When attempting to solve a problem there are proven tools and methods which increase chance of success.

Tool: Problem Statement - a clear, concise statement of what's wrong. A problem clearly defined is a problem half solve.

Notes:

Metrics

Concept: There is a need to measure improvements to claim an improvement.

Metrics - Quantifiable measures that can assess the performance of a process.

Purpose of a metric is to drive behavior.

Core four metrics are: Cost, quality, delivery, and safety

- Do not subordinate one metric for another and call it process improvement.

Metrics can be the root cause of the problem or behaviors we are experience

Notes:

Tool: SMART goal setting – used a filter to goals are valid.

- Specific
- Measurable
- Attainable
- Relevant
- Time-bound



Concept: Facilitators and teams need decision making tools because of the complexity or difficulty of decision to be made.

Generate list of possible ideas or solutions.

Tool: Brainstorming – fast paced idea generation. Laughter is a sign of good brainstorming.

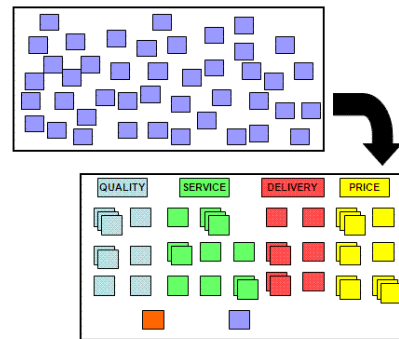
Notes:

Organize and narrow the ideas or solutions.

Tool: Affinity Diagram – categorize ideas.

Provides structure to brainstorming ideas

Notes:



Tool: 5 Whys analysis – Ask “why did that occur” five times and you will find the root cause.

Drill down the problem by asking why.

Notes:



Risk Analysis

Risk analysis is the planning for problems that have not yet occurred.

What *could* happen vs. what *did* happen

Tool: Failure Mode and Effects Analysis (FMEA) – quantifiably measure and compare risk, then determine what course of action to take for each.

How could the process fail and what is the effect of that failure?

- Severity x occurrence x ability to detect = Risk priority number (RPN)

Compare RPNs to find highest number and develop strategies to reduce RPN.

Notes:



Lean Six Sigma Countermeasures

5S, standard work and visual management

Concept: Use proven best practices for continuous improvement.

- *Tool:* 5S – organize the physical work place for process excellence. 5 step process to organize work area
 - Sort: Remove the un-necessary
 - Red tags are used to identify items to be disposed of later
 - Red square is the term used to describe the area where red tagged items are brought
 - Straighten: Place the necessary in the optimal location
 - Point of use (POU) thinking – the more often tools or materials are used the closer they should be to the work area.
 - Shine: to clean and inspect
 - Find sources of grime and search for/eliminate safety hazards
 - Standardize: Incorporate first 3Ss into regular duties (checklists, processes, etc.)
 - Sustain: Leadership audits communicates importance
 - Inspect what you expect

Notes:



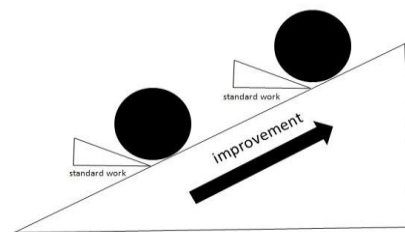
Lean Six Sigma Countermeasures

Tool: Standard Work - agreed upon set of work procedures and best practices that document the interaction of people, materials and machines.

Inconsistent process = inconsistent results. Consistent process = expected results.

Developed by the people who do the work – key for $Q \times A = I$

Notes:



Without a standard, there can be no Kaizen (improvement)

Tool: Visual Management – make the workplace visual using colors, shapes, lines, etc.

Two components:

Visual display: Share information – people all have same understanding of status

Visual control: Drive the actions of people – communicating where to go and why using visuals

Notes:



Lean Six Sigma Countermeasures

Poka-Yoke, quick changeover, leveling and cell design

Tool: Mistake Proofing (Poke-Yoke) – use a 100% inspection device to automatically detect errors so they are NOT passed to the next stage of the operation.

Reduces the cost of poor quality by preventing errors from becoming defects

Most mistakes are inadvertent in nature

Yellow Belts ask better questions “Could we implement an error proofing device?” not “Who did it?”

Notes:



Sustainment Actions

Concept: Prevent regression and commit to continuous improvement.

Tool: Audits - To sustain improvements leadership and audits are necessary.

Inspect what you expect – leadership inspections communicate to employees what is important.

5S sustainment audits, error proofing inspections to ensure they still work as designed, preventative maintenance, etc.

Notes:

Tool: Continuous Improvement (CI)

By continuously doing 5S, kaizen or other waste elimination events TIM WOOD (U) does not have the opportunity to creep back in.

This becomes the organizational philosophy and how we do business.

Training, education, promotion, recognition and other programs are based on waste elimination and operation excellence.

Culture of continuous improvement (CI) begins to develop - Leadership responsibility.

Parking lot items can be source of CI ideas or work processes for next kaizen event.

Notes:

Tool: Replication: repeat success for maximum impact across organization.

Beware of “not invented here” syndrome

Replication by performance measure – by showing what is possible a new standard can be developed and managers/executives can be held accountable to achieving measurable (attainable) results.

Notes:

Best of luck!

Luck: *When preparation meets opportunity*



The American Association for Lean Six Sigma Certification

Your road to success!

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