Leadership and the Toyota Production System

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Toyota Supplier Support Center (TSSC)

Formed 1992 in response to increasing interest in the Toyota Production System or TPS
TSSC, Inc.

After 10 years experience in supporting North American companies to implement TPS, TSSC, Inc has been formed in May 2002.

Our focus is to work with companies outside of Toyota who have an interest in TPS and continue Toyota’s contribution to society.
Why did this result happen? What is the principle?

- **Objective:**
  - To assist North American companies in implementing their own version of TPS

- **Method:**
  - Create learning through trying and reflecting
Characteristics of Successful TPS Companies

• “Plant First” philosophy: Learn TPS on the shop floor

• Enthusiasm for improvement

• Persistence

• Willing to start small, learn through trial and error
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TPS is built on the scientific way of thinking

Develop a way of thinking how do I respond to this problem not a tool box
Willing to start small, learn through trial and error

Each activity builds on the other to achieve the desired result
TPS Vision of the Ideal – True North

What We Should Do, not What We Can Do

Customer Satisfaction
- 0 defects
- 100% value added
- 1x1, in sequence, on demand

Human Development
- Physical & Mental Safety
- Security
- Professional Challenge

EVERYONE
every minute
every day

Current Condition

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The Journey to True North
Where do I start?

What We Should Do, not What We Can Do

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Where do I start?
Analyzing the big picture?

Where does this lead us …
Analyzing the big picture?

- So many problems – Again where do I start?
- Takes much time for investigation
  -- People lose energy – finding problems but not fixing
  -- People become frustrated – nothing is changing
- Looking only at the surface
  -- What are we observing – skill to see is not developed
Where do I start?

Inventory Count

Material Supplier

Molding

Paint

Ass’y.

Warehouse (5 days inventory)

Shipping

Customer

Production Control

We start at the activity level
Foundation to TPS – Heijunka, Standardized Work and Kaizen

Goal: Highest Quality, Lowest Cost, Shortest Lead Time

Just-In-Time
• Continuous Flow
• Takt Time
• Pull System

Heijunka

Standardized Work

Jidoka
• Stop and notify of abnormalities
• Separate man’s work and machine’s work

Kaizen
How to See if Activity based on True North?

True North

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- 0 defects
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Current Condition

Standardized Work

The most efficient work flow - considering safety, quality, quantity and cost

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Standardized Work as the Window to True North

We say Physical and mental safety for people
This shows where we are applying
  Physically - Safety guarding, procedures in place
  Mentally – Team member confirmation of quality in their process

Kaizen
Shows where Is my bottleneck

We say 0 defects; 100% value add; 1x1 on demand, in sequence
This shows where we are applying:
  0 defects – Each team member confirming own quality
  100% value add -- work flow is smooth, movement is minimized
  -- cycle time = takt time
  1x1  -- where and how many pieces of inventory in this process
Creating Standardized Work

Most efficient work flow - considering safety, quality, quantity and cost
→ With the main consideration on human movement

How can I create work so that it can be repeated?

- Takt Time
- Work sequence
- Standard in-process stock

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Creating Standardized Work

Theory of Standardized Work
Most efficient work flow - considering safety, quality, quantity and cost

Real World
Quality problems, scrap, fluctuation, machine downtime, absenteeism, difference in operator skill, hard work ...

Leader must constantly strive overcome “real world” problems to create the condition for standardized work to happen
Creating Standardized Work

Baseline – Create the work standard
-- How the part should be assembled
-- What is ok/no good quality
-- How to confirm ok/no good quality
Creating Standardized Work

1. Identify what is preventing the operator from the most efficient work flow – considering safety, quality, quantity and cost?

2. Eliminate this problem
3. Evaluate
4. Standardize the work

Excess walking
Defects Rework
Wait on M/C
Heavy Lift & Bend
Creating Standardized Work

1. Identify what is preventing the operator from the most efficient work flow – considering safety, quality, quantity and cost?

2. Eliminate this problem
3. Evaluate
4. Standardize the work

- Periodic Work
- Walking
- Wide hand motions
- M/C downtime
Case Study Example

Process Flow:

Stamping ➔ Assembly ➔ Shipping

Assembly Process:
Case Study Example – Creating Standardized Work

Questions to ask: Can the operators follow the most efficient work flow – considering safety, quality, quantity and cost?

Video:
Initial Condition – What is the biggest problem?

Cost ↑ -- Cycle time < Takt time

Actual 9 operator – ∑CT 222” = 5 ops
Case Study Example – Creating Standardized Work

Connect the operators to allow sharing of work

- Video: Create 1 piece flow
  - Connect all processes in sequence
  - Remove sitting for operator flexibility
  - Remove tables in between processes to minimize walk and location for inventory build
  - Reduce width of work stations to minimize walk
  - Rebalanced work to 7 operators

1 x 1 makes more problems visible
Questions to ask: Can the operators follow the most efficient work flow – considering safety, quality, quantity and cost?

Video:
After 1 piece flow – What is the biggest problem?

Operator # 5 CT > TT – can not meet output
Case Study Example – Creating Standardized Work

Reduce waste in operators work

Video:
- Reduce empty walk
- Reduce reach for parts – parts at point of use
- Standard in process stock and transfer position with downstream operator
- Work while machine works
- Reduce double handling – auto part eject

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How can I make a better condition for standardized work?

-- Output impacted by:
- part shortages
- high work content / lower work content parts
- Large containers from upstream causing downtime to changeover
- etc…
As a leader you have developed your skill to observe deeply and broadly. You can now see the problems caused by connections with other processes. What do I make next? Large lot size? Part shortage?
System Supports the Process

Customer

Heijunka Box

Material Supplier

Molding

Ass’y.

Shipping

Creates the condition for the operator to produce what is needed, how many needed, when needed
Foundation to TPS – Heijunka, Standardized Work and Kaizen

Heijunka  Standardized Work  Kaizen

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Heijunka

Standardized Work

Kaizen

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Leadership Characteristics for TPS

1. Think deeply
   -- Genchi Genbutsu
   -- Think deeply on what you see
   Immediately try your idea

2. Do small and gradually
   -- Relating the manufacturing method to the people’s work

3. Always question “What’s next
   -- Don’t dwell on how much better we are
   but how much farther we have to go