Work Standardization & Metrics-Based Process Mapping

LEARNING OBJECTIVES

- The objectives & benefits of work standardization
- The step-by-step process for work standardization
- How to standardize “high variation work”
- Characteristics of job aids
- Current state documentation techniques
- How to create Metrics-Based Process Maps

STANDARDIZED WORK – DEFINITION

The *current* single best way to complete an activity with the highest degrees of safety and efficiency, which produces consistent and high quality outcomes.

STANDARDIZED WORK

A tool for maintaining quality, safety, productivity, and *employee morale* at the highest possible levels.

STANDARDIZED WORK

"Standardized work nips common problems in the bud so that staff can focus instead on solving uncommon problems."

– Bill Marriott, CEO, Marriott Hotels

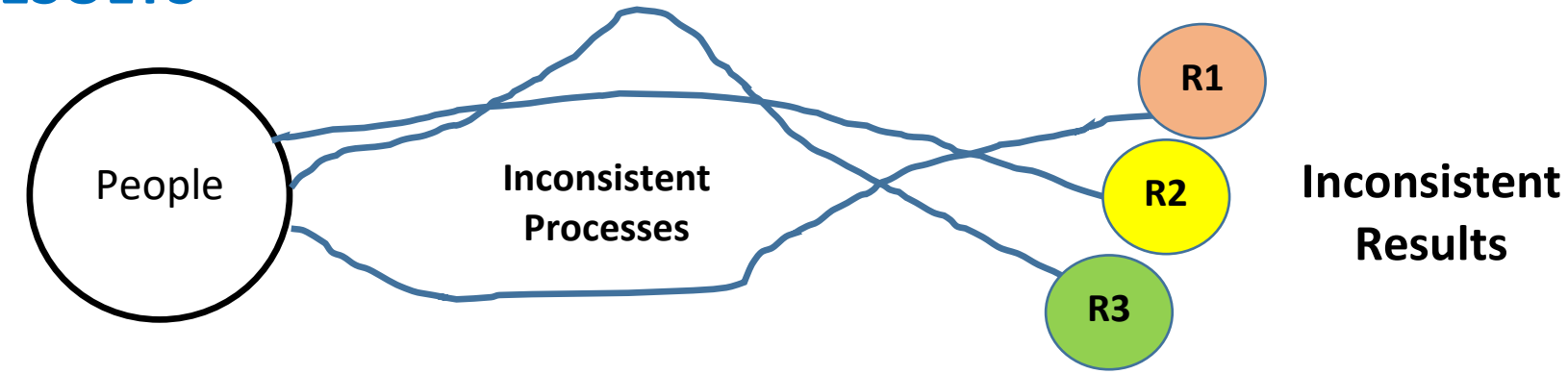
(Some of) THE OBJECTIVES OF STANDARDIZED WORK

- Reduce variability, increase predictability
- Enhance repeatability, confidence, consistency
- Clarify procedures
- Enhance communication
- Improve ‘Problem Solving’
- Set good discipline
- Develop awareness
- Establish “Problem Consciousness”
- Establish a basis for education & training
- Establish a baseline for performance
- Improve Quality, Safety, Delivery, Cost…
- Provide the basis for Improvement

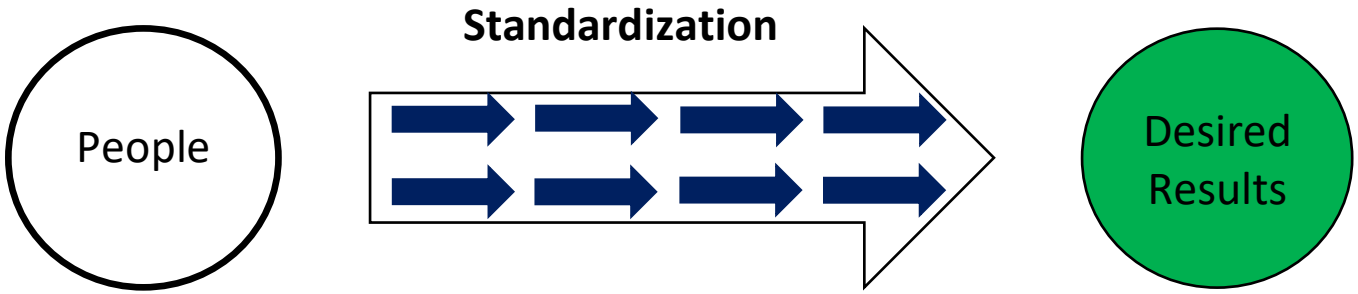
BENEFITS OF STANDARDIZED WORK

- Consistent quality
- Improved productivity
- Easier, more effective training
- Predictability; better decisions
- Foundation for making improvement

STANDARDIZED PROCESSES YIELD CONSISTENT QUALITY RESULTS

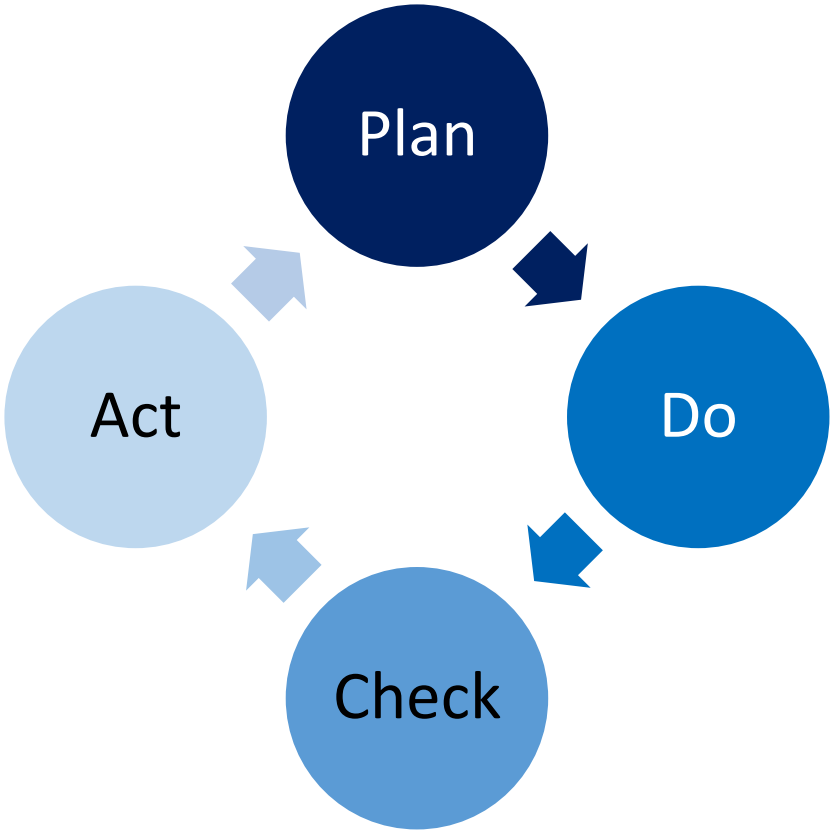


TRADITIONAL = People doing what they can to get results.



LEAN = People using standard processes to get results.

THE IMPROVEMENT PROCESS

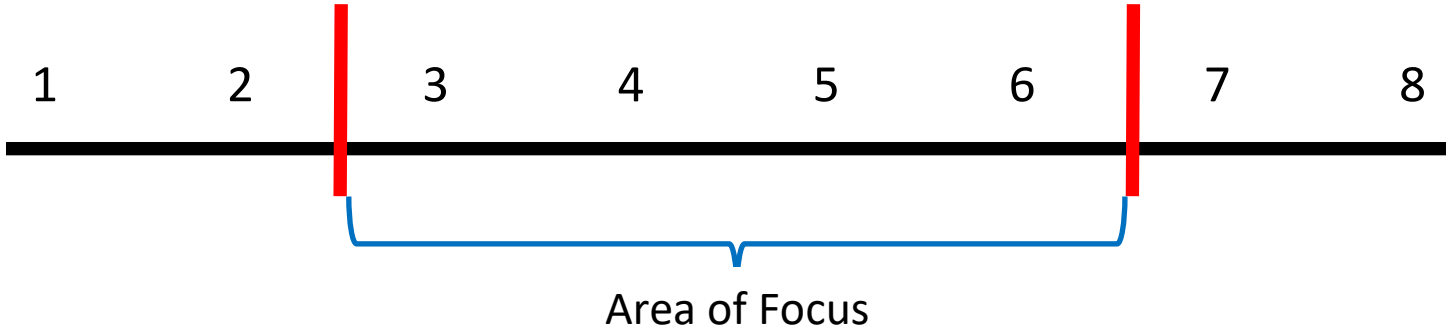


PROCESS FOR CREATING STANDARDIZED WORK

1. Define scope – “fence posts” and conditions
2. Form improvement team
3. Study the current state to gain a deep understanding
4. Design the improved state
5. Document the improved state
6. Test and gain consensus
7. Finalize and implement new standardized process
8. Measure results; adjust if needed
9. Monitor ongoing performance

DEFINE SCOPE

- Select the first and last steps (fence posts) between which you'll standardize the process.



- Limit the conditions initially to reduce variation as you seek to deeply understand the current state. Aim to apply the future state to as broad a set of conditions as possible.

IMPROVEMENT TEAM

- No more than 10 people on a team.

- Composition:
  - Process workers (approximately 50% of the team)
  - Upstream suppliers (internal and/or external)
  - Downstream customers (internal and/or external)
  - Outside eyes – people who have no “skin in the game”; 100% objective
  - Support services
  - Subject matter experts

STUDYING THE CURRENT STATE

- Steps: observe, measure, document, analyze
  - Document the current state – options:
    - Spaghetti diagrams, photos, drawings, etc.
    - **Metrics-based process map (MBPM)**
  - Identify variation in terms of input, data, people, equipment & supplies, environment, etc.
  - Study root cause(s) of variation
  - What are the best practices?

WHAT IS A METRICS-BASED PROCESS MAP (MBPM)?

- A visual process analysis tool, which integrates:
  - Functional orientation of traditional swim lane process maps
  - Key lean time and quality metrics

- Tool which highlights the disconnects / wastes / delays in a process.
  - Keeps the improvement focus properly directed

- Means for documenting standardized work for workforce training and process monitoring.

LEAN FACILITATOR RANGE OF NECESSARY TRAITS

- Skills / Knowledge:
  - Defining value; identifying waste
  - Improvement tools (root cause analysis, flow-enhancing tools, etc.)
  - Project & time management
  - Team building / facilitation
  - Mediation; consensus building
  - People effectiveness – from front line workers to execs
- Authority / Respect:
  - Designated change agent / influence leader
  - Trustworthy
  - Comfortable removing obstacles / reaching out to senior leadership

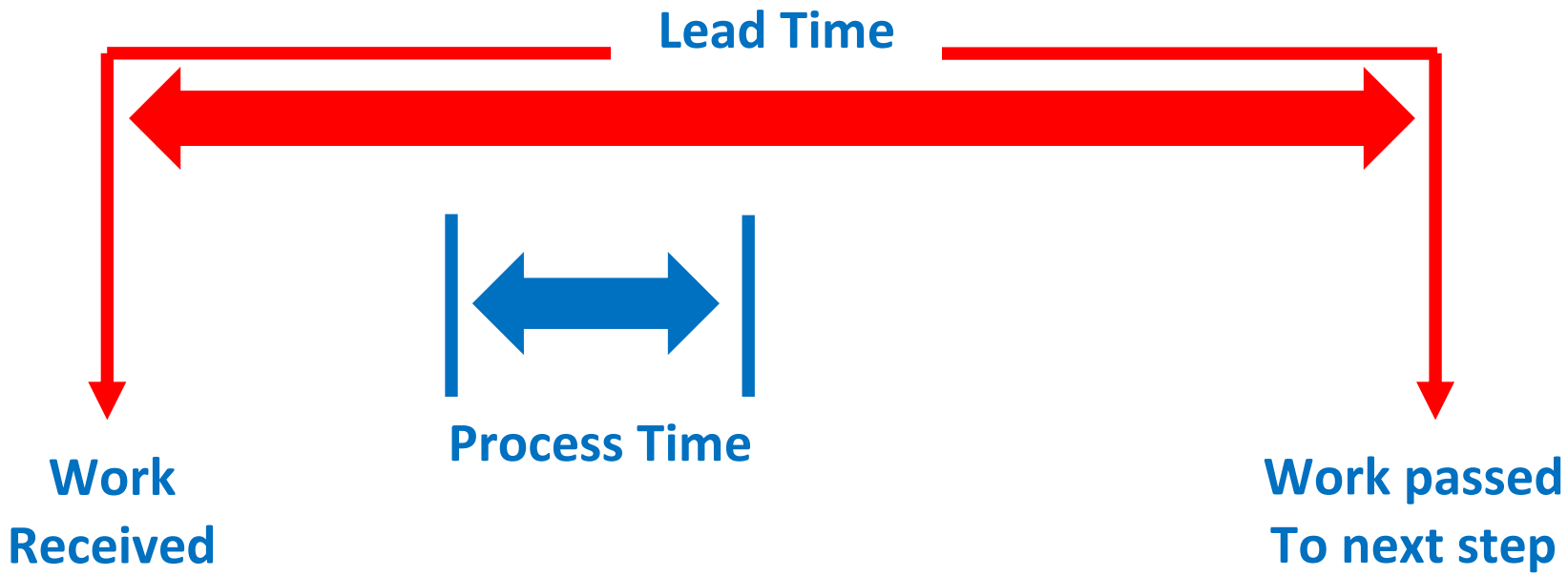
LEAN FACILITATOR RANGE OF NECESSARY TRAITS *(continued)*

- Personality / Energy:
  - Naturally curious
  - Challenging, yet supportive
  - Positive, upbeat, energetic
  - Pushy without irritating
- Objectivity / Fairness:
  - No attachment to the work being improved

KEY METRICS: TIME

- Process time (PT)
  - The time it takes to actually perform the work, if one is able to work on it uninterrupted.
  - Includes task-specific doing, talking and thinking.
  - aka “touch time”, work time, cycle time.
- Lead time (LT)
  - The elapsed time from the time work is made available until it’s completed ***and passed on*** to the next person or department in the chain.
  - aka throughput time, turnaround time, elapsed time.
  - Includes Process Time, not merely waiting time.

LEAD TIME VERSUS PROCESS TIME; EXAMPLE:



LT = PT + Waiting / Delays

KEY LEAN METRIC: QUALITY

- % Complete and Accurate (%C&A)
  - % time downstream customer can perform task without having to "CAC" the incoming work:
    - **C**orrect information or material that was supplied
    - **A**dd information that should have been supplied
    - **C**larify information that should or could have been clear
  - This output metric is measured by the immediate downstream customer and all subsequent downstream customers.
  - If workers further downstream deem the output from a particular step to be less than 100%, multiply their assessment of quality with the previous assessments.

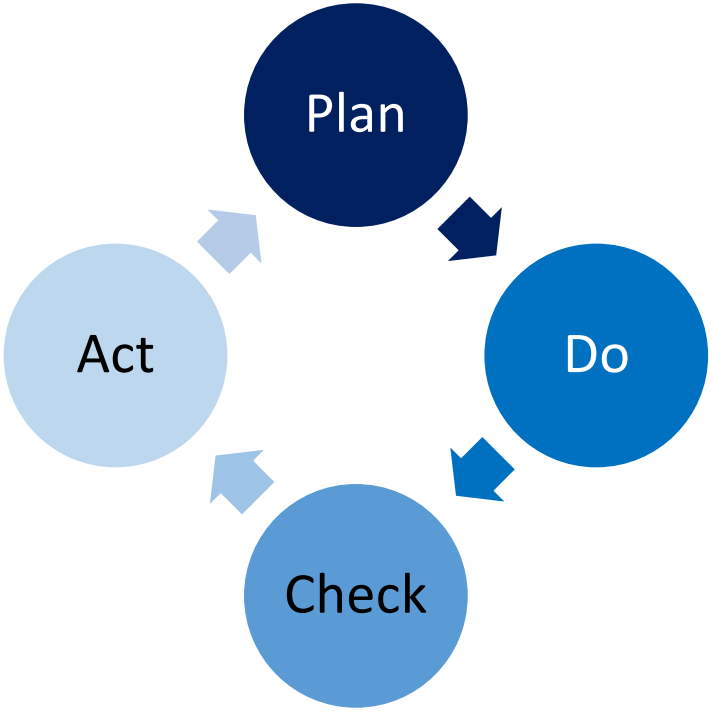
CUSTOMER-DEFINED VALUE

- Value-Adding (VA) – any operation or activity your ***external customers*** value and are (or would be) ***willing to pay for***.

- Non-Value-Adding (NVA) – any operation or activity that consumes time and/or resources but does not add value to the product (good or service) the customer receives.
  - Necessary – support processes, regulatory requirements, etc.
  - Unnecessary – everything else – ***WASTE***

DESIGN THE IMPROVED STATE

- Assure it's an improvement, not merely a change.
- Avoid "process tampering".



AVOID "PROCESS TAMPERING"

- Process tampering is making changes with:
  - A complete understanding of the process.
  - The basis (measurement) to predict how the process will perform with the improvement in place.

- Process tampering is often a result of firefighting – dousing the flames without the basic understanding of what caused them and root cause corrective action.

- Process tampering typically doesn't lead to improvement and often worsens the process.

AVOID "PROCESS TAMPERING"

Process Improvement	Process Tampering
Simplifies	Complicates
Fire Prevention	Fire Fighting
Measurable	Subjective
Fact Driven	Opinion Driven
Improves Morale	Erodes Morale
Prediction	Detection
Customer Focus Mandatory	Customer Focus Optional
Processes are Improved	Blame is Established
Saves Money	Costs Money

FUTURE STATE DESIGN CONSIDERATIONS

- Eliminate steps / handoffs
- Combine steps
- Create parallel paths
- Alter task sequencing and/or timing
- Implement pull
- Reduce / eliminate batches
- Improve quality
- Create an organized, visual workplace
- Reduce changeover
- Eliminate motion & transportation
- Standardize work
- Eliminate unnecessary approvals / authorizations
- Stop performing non-value adding (NVA) tasks
- Co-locate functions based on flow; create cells (teams of cross-functional staff)
- Balance work to meet ‘takt’ time requirements

DOCUMENT PROJECTED FUTURE STATE RESULTS

Metric	Current State	Projected Future State	Projected % Improvement
Timeline – Process Time			
Timeline – Lead Time			
% Activity			
Total – Process Time			
Labor Effort			
Freed Capacity			

SUMMARY METRICS: LABOR EFFORT

- Total Process Time (PT)
  - Sum of all activities, not just timeline.

- Labor Effort

$$\text{\# FTE's} = \frac{\text{Total PT (in hours) X \# occurrences/year}}{\text{Available work hours/year/employee}}$$

$$\text{Freed Capacity} = \text{Current State FTE's} - \text{Future State FTE's}$$

* **FTE =** Full-time Equivalent employees (2 half time employees = 1 FTE)

NOTE: Can convert into labor expense if want to show financial impact of waste. Or report in hours if less than 1 FTE difference.

FUTURE STATE FACILITATOR TIPS

- Reduce resistance by pointing out how “boring” waste is and how energizing it is to provide customer value.
- Spark innovation by using examples outside your own company / industry.
- Guarantee the team that they will not lose a paycheck (if they eliminate their own position) and that they’ll be properly trained for any new role they take on.
- Guarantee the team that if the process is more difficult (after a learning period), we’ll revisit the improvement.
- Guarantee the team that you’ll only make a process change if it’s indeed an improvement.

DOCUMENT THE IMPROVED STATE

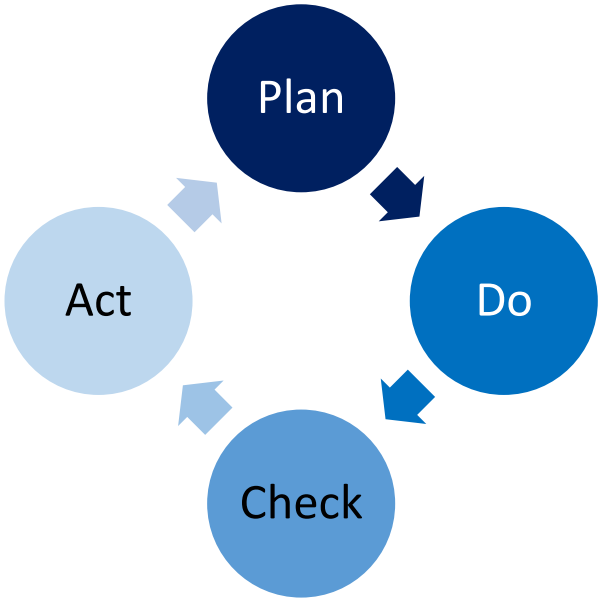
- Reduce reliance on traditional standard operating procedures (SPO's).
- Increase reliance on the metrics-based process map itself and "job aids".
- Include the expected process performance metrics.

JOB AID CRITERIA

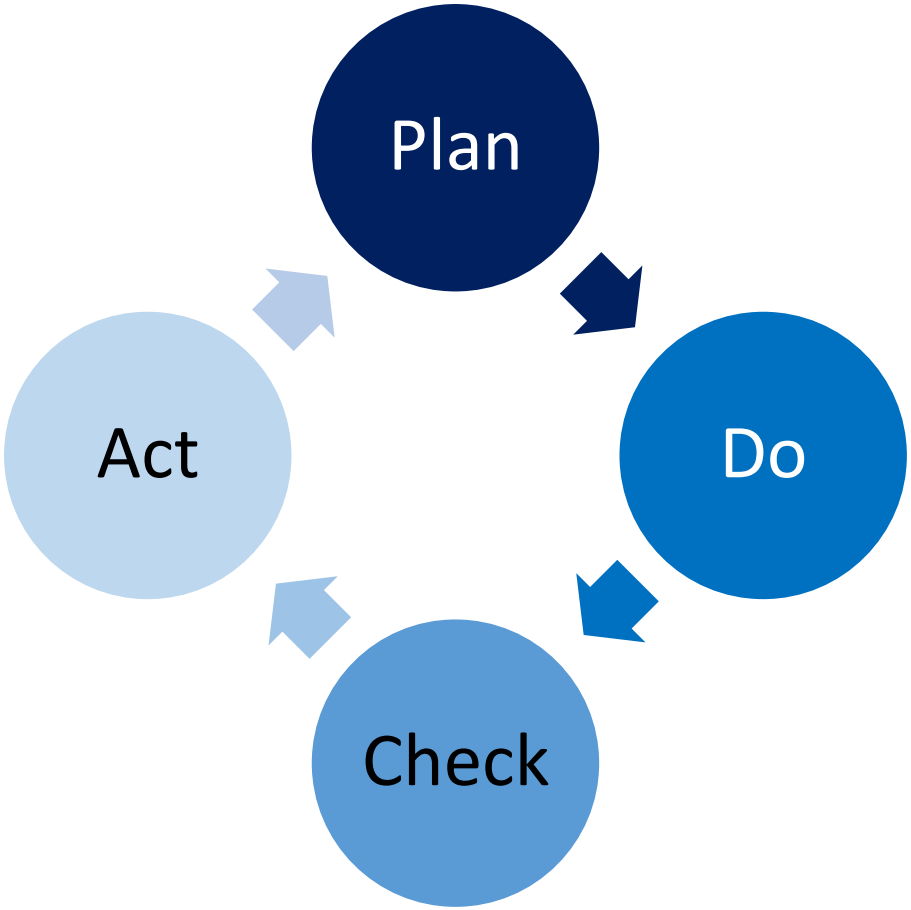
- Serves as memory jogger
- Simple
  - Just the facts
  - Strong emphasis on reducing variation to improve safety, quality & efficiency
- Visual – Strong use of:
  - Color
  - Photos
  - Drawings
- Physical
  - Posted where the work is done (and/or carried by process worker)
  - **Not hidden in a computer**
- Created by the people who do the work
  - With strong involvement by the customer
  - Test thoroughly!
  - Gain consensus

IMPROVEMENT TESTING

- Purpose: Work out the bugs and gain consensus (to enable sustainability).
  - Run on “real time” processes.
  - Have others review, comment, etc.
    - As broad a sample as is “reasonable”.
  - Adjust as needed.

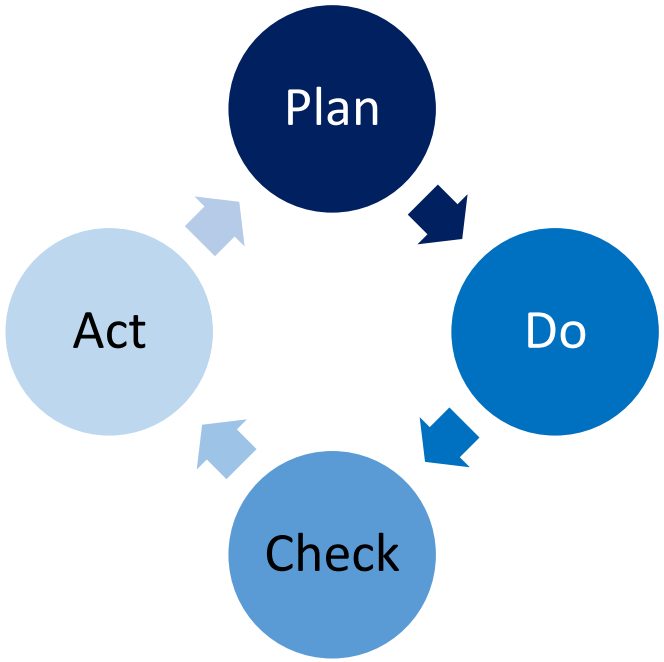


THE IMPROVEMENT PROCESS



FINALIZE & IMPLEMENT

- Implementation = relevant and effective training.
- Consider non-traditional means.
- Never communicate changes by email alone.



MEASURE RESULTS

- Use the same metrics, so we compare apples to apples.
- Adjust if needed.
- Communicate results!
- Post the results in a high traffic location.

MONITOR ONGOING PERFORMANCE & CONTINUOUSLY IMPROVE AS NEEDED

- Who?
  - Establish a “process owner” – supervisor or below.
- How often?
- How are results communicated?
- Who coordinates ongoing improvement?

“We get what we expect and we deserve what we tolerate.”

WORK STANDARDIZATION: SUMMARY

- Must be created by the people who actually do the work.
- Remove all obstacles to worker success.
- Beware of over-standardization re: process and environment – it's the results that matter.
- Must be clearly and easily communicated; metrics-based process mapping (MBPM) and job aids are indispensable tools.
- Must be monitored and modified frequently.
- Frequent retraining may be necessary.

LEARNING OBJECTIVES

- The benefits of work standardization.
- The step-by-step process for work standardization.
- How to standardize “high variation work.”
- Characteristics of job aids.
- Current state documentation techniques.
- How to create Metrics-Based Process Maps.

“Excellence with Integrity”