If I Could Do it Again....

A New Journey Toward Continuous Improvement Through a Systematic Approach

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Westinghouse Electric Company
The Far East

Asanas with Props

The ancient yogis used logs of wood, stones, and ropes to help them practice asanas effectively. Extending this principle, Yogacharya Iyengar invented props which allow asanas to be held easily and for a longer duration, without strain.

Yogacharya Iyengar in Setubandha Sarvangasana

This version of the posture requires considerable strength in the neck, shoulders, and back, requiring years of practice to achieve. It should not be attempted without supervision.
The Deep South
Why Continuous Improvement?
Experience...
Steps to Achieving Success

- **Thinking** about gaps and performance trends
- **Working** to continuously improve
- **Behaving** consistent with Human Performance and customer-valued behaviors to differentiate Westinghouse
What is Customer 1st?

- Structured continuous improvement
  - Systematic data-driven process
  - Training with project focus
  - Proven tools, methods and behavioral differentiators
- Focused on Customer needs and success
- Management reinforced – a way to work

Customer 1st is a continuous journey
Why Customer 1st?
Voice of Our Customers

- Expectations for Industry and Customer Improvement
- Capable Workforce - Technical Expertise and Knowledge
- Inconsistent Quality of Execution and Ease of Doing Business
Four Elements Provide Broad Coverage for Customer 1st

- **Lean Enterprise**: Reducing waste
  - Evolved from Toyota Production System
## STANDARDIZED WORK SHEET

### Final Assembly

<table>
<thead>
<tr>
<th>WORK ELEMENT</th>
<th>KEYPOINT SYMBOL</th>
<th>WORK TIME</th>
<th>WAIT TIME</th>
<th>WALK TIME</th>
<th>KEY POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove pilots &amp; seat remaining tubes against bottom nozzle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>111</td>
</tr>
<tr>
<td>Complete WATTS transactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>Start thimble screws into thimble tube end plugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>209</td>
</tr>
<tr>
<td>Torque screws</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>Obtain a simulator plate and clean with acetone/alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>68</td>
</tr>
<tr>
<td>Insert alignment tools into inserts and move top nozzle yoke until inserts slip over thimble tubes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>Adjust simulator plate if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23</td>
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<tr>
<td>Install lock tubes with chamfered end of lock tube first</td>
<td></td>
<td></td>
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<td></td>
<td>161</td>
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<tr>
<td>Align bulge carriage with skeleton fixture</td>
<td></td>
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<td>16</td>
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</tbody>
</table>

### Team Member Motion

(OR PICTURE)

### Symbol Legend

- **Questioning**
- **Safety**
- **Material Safety**
- **Think Act & Review**
- **Error Likely**
- **Handling**
- **Foreign**
- **Question**
- **Personal Safety 2 minute Rule**
- **Temporary**
- **Transfer**
- **Document**
- **Safety Significant**
- **Computer Transaction**
- **Safety**
- **Significant**
- **Handling**
- **Error Likely**
- **Thinking**
- **Personal Safety**
- **Brief**
- **Inspect Step**
- **Time Out**
- **Briefs**
- **Safety**
- **Significant**
- **Computer Transaction**
- **Question**
- **Personal Safety 2 minute Rule**
- **Temporary**
- **Transfer**
- **Document**

### Material

- **Excluded**
- **Restrictions Apply**
- **Significant**
- **Computer Transaction**
- **Question**
- **Personal Safety**
- **Brief**
- **Inspect Step**
- **Time Out**
- **Briefs**
- **Safety**
- **Significant**
- **Computer Transaction**
- **Question**
- **Personal Safety 2 minute Rule**
- **Temporary**
- **Transfer**
- **Document**

### Work Element Sub Total

<table>
<thead>
<tr>
<th>Item</th>
<th>Work Total</th>
<th>Work Time</th>
<th>Wait Time</th>
<th>Walk Time</th>
<th>Total</th>
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<tr>
<td>TOTAL</td>
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<td>3,766.00</td>
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### Revision Record

<table>
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<tr>
<th>DATE</th>
<th>DEPARTMENT</th>
<th>PROCESS NAME</th>
<th>M M</th>
<th>KEYPOINT WORK WAIT WALK</th>
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<tbody>
<tr>
<td>12/18/2006</td>
<td>Final Assembly</td>
<td>Fabricate Skeleton Automatic</td>
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</table>
Four Elements Provide Broad Coverage for Customer 1st

- **Lean Enterprise**: Reducing waste
  – Evolved from Toyota Production System
- **Six Sigma**: Reducing variability
  – Evolved from Motorola
- **Human Performance**: Eliminating human errors
  – Evolved from INPO/WANO
- **Behavioral Differentiation**: Differentiating Westinghouse through behavior toward our Customers
  – Evolved from Terry Bacon’s theory on Behavioral Differentiation

A unique integrated approach
Flowdown Methodology:
“Y” (Outcomes) are an “f “ (Function) of “x” (input variables)

\[ Y = f(x_1, x_2, x_3, x_4) \]

- \( x_1 \) = Plant or equipment item
- \( x_2 \) = Process variables for equipment
- \( x_3 \) = Human operating the equipment
- \( x_4 \) = Operating conditions (environment)

- **Lean** looks at \( x_1 \) and \( x_3 \) (Flow and Waste)
- **Six Sigma** looks at \( x_1 \) and \( x_2 \) (Quality and Variability)
- **HuP** looks at \( x_3 \) and \( x_4 \) (Performance and Error Reduction)
- **Behavior Differentiation** seeks outcomes that exceed the customer’s expectations
Customer 1<sup>st</sup> Roles and Responsibilities

- **Customer 1<sup>st</sup> Leaders (CFLs)**
  - 2-year, full-time commitment
  - 6-weeks training over 6 months
  - Expectation of 6 projects over 2 years
  - Lead teams that solve business problems

- **Master Customer 1<sup>st</sup> Leaders (MCFLs)**
  - Advanced tools and training
  - Manage Customer 1st people and projects
  - Mentor CFLs and Green Belts
Leadership as a Process, not an Event

Starts before knighting  (Ex: Kodak)
Corrective Action Program
Prior to Improvements

Issue Types
- Unknown
- Low
- Medium (ACA)
- High (RCA)

Significant
Repeat
Events

Proper Solution
CC-STC-3139 Project Plan

- Team Formed (4/3)

Develop Communication Plan (4/27)

- Communication Plan Approved (5/4)

Implement Communication Plan (on-going)

Develop Interim Actions Plan (4/20)

- Implement Interim Actions (per plan)

Gap Identification (define current state versus desired end state) (6/1)

- Identify Primary Contributors to GAP (6/8)

Identify Root/Common Causes of GAP (6/15)

- Propose Solutions to Close GAP (7/6)

Proposal of Solutions (7/13)

- Implementation Plan Approved (8/31)

Monitoring Plan Approved (8/31)

- Management Sponsorship Project Plan
- SIPOC Gap Analysis Process Map Data Collection Plan MSA, Voice of Customer
- Operational Experience Cause & Effect Matrix ABC Analysis
- Why Tree ABC Analysis
- TRIZ, Benchmarking, Kano, Effectiveness Ranking Stakeholder Input
- Control Plan Metrics Stakeholder Ownership

Processes

Tools

Behavior Action Plan (BAP) Stakeholder Ownership
Behaviors

- A major focus of this project is to identify behaviors that are driving CAPs ineffectiveness and replace them with desired behaviors.
- This project evaluated the behaviors of all levels, including senior management, line management, and end users.
Systematic Process to Identify Proposed Solutions

- The CEIT core group generated a fishbone diagram, which identified the attributes of an optimal corrective action program. The diagram, which was based upon INPO documents and expert opinion, was validated by the full CEIT team.
Systematic Process to Identify Proposed Solutions

- A GAP Analysis was performed to assess the current state of the Westinghouse Corrective Actions Program and associated behaviors verses those of the optimal program.
- Inputs to the GAP analysis included the CAPs Metrics, various CAPs Issues, CAPs-related procedures/guidelines, and valuable insight provided by CEIT members and Nuclear Fuel site WFMS Organizational Improvement leads.
Corrective Action Program

After Improvements

Proper Solution

All Issues go into CAPS (Lower Threshold) Issue Types
- Unknown
- Low
- Medium (ACA)
- High (RCA)

Improve Issue Throughput

Reduce Repeat Events (Correct CATPR)

Reduce In-Process Issues (Backlog & Legacy Issues)

Significant Repeat Events
Why Discuss CAP Improvements?? I Thought This was an HU Discussion!!

- Just Culture
- Healthy Reporting Culture
- Informed Culture
- Continuous Improvement
- Learning Organization
But… Keep the Human in Human Performance
Implementing Change is Never Easy

“The only person that embraces change is the baby with the dirty diaper”

John Summers
Stupid Mistake, but Actor wasn't Aware of Stupidity

Conduct Investigation
Actor is Negligent (What Were You Thinking?)

Error is Unforgivable (Why Did You Fail?)

Tour at INPO
Actor is Reckless (What was Your Motivation?)

Reassign person to New Plant Project
Evaluate Process Protection (Procedures)

Evaluate HU Tool to Task (Disconnect)
Every KPI at Every Plant!!

<table>
<thead>
<tr>
<th></th>
<th>1-Jan</th>
<th>1-Feb</th>
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<td>8</td>
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</table>
Nuclear is the Future!!

Safe

Viable
Customer 1\textsuperscript{st}

“Good is the Enemy of Great.”