Integrated Safety Management
Best Practice:
Corrective Action Program and the Safety Culture

August 27, 2007
Introduction

- **Electronic Suspense Routing and Tracking System (E-STARS®)**
  - Web based action tracking and work flow management system
- **Problem Evaluation Request (PER)**
  - Web based corrective action management system
  - Module of E-STARS®
- **Together**
  - Problem identification
  - Graded approach management
  - Cause to corrective action assignment and tracking
  - Objective evidence closure
  - Record repository
Numerous challenges at Hanford necessitated change:

- DOE performance letter in 2001
  - PER and E-STARS® deployed
- Multiple layoffs, mission acceleration, restructuring, funding cuts
- Significant legacy issues emerged
  - lower level assessment = robust issue identification
- Increased injury and event rates
- Increased stop works and union grievances
HPI Steering Committee Strategy

- Shift the organizational focus -

From:

- Emphasizing administration in our processes
- Robust defense against second guessing
- Robust reaction to events

To:

- Robust hazard Identification and mitigation
- Processes built for the user
- Robust prevention of events
Gap Analysis

- Use INPO HPI Process as Benchmark
- Adapt Process for TFC Use
- Conduct PER Review with Focus on People, Communications, and Management

- Conduct Qualitative Evaluation of 7 Functional Areas (INPO Gap Analysis Tool)
- Conduct Interviews of Causal Analysis Personnel for Selected Events
- Conduct Procedure Review Using HPI Checklist

- Conduct Interviews Using INPO HPI Assessment Criteria

- Analyze Results
- Identify Strengths
- Identify On-going Initiatives Where HPI Tools Can Be Easily Adapted
- Identify Opportunities for Improvement

Establish and Implement HPI Strategies
- Communication Strategy
- Education Strategy
- Organization/Process Strategy
PER/E-STAR$^\text{©}$ as an ISM Best Practice

- Enhances productivity through web-based technologies
  - Built for the users
  - Single problem identification and action tracking system
    - Retired legacy tracking systems
- Optimizes processing time through system automation
  - Easier to use = more use
  - Process drives immediate assignment to management
- Provides real time feedback for continual improvement
  - Increased user confidence in process
PER/E-STARS® as an ISM Best Practice (cont.)

- Single point of entry for timely identification and evaluation of conditions and the correction of deficiencies adverse to:
  - Quality
  - Safety
  - Health
  - Operability
  - Environment

- Graded approach application to corrective action management
Worker Level Assessment

- Enables personnel the ability to:
  - Identify quality and safety-related deficiencies
  - Request process improvement evaluation
  - Request clarification of requirements
  - Evaluate lessons learned reports
  - Manage concerns, findings, or observations from surveillances, audits, or inspections, and
  - Manage action items, overall

- Overall increased information flow up and down the chain
ISMS Continuous Improvement based on effective problem identification, worker involvement, and event prevention.
ISMS continuous improvement is based on an open work environment where everyone feels free to raise issues without fear of retaliation.
Employee involvement

- Originator defined level of participation
  
<table>
<thead>
<tr>
<th>Level of Participation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you like to be contacted during disposition of this PER?</td>
<td>Yes ☑ No ☐</td>
</tr>
</tbody>
</table>
  | Level of Participation | I would like to help define the problem
  |                     | I would like to help in investigating the cause
  |                     | I would like to review the corrective actions at closure to ensure they were effective
  |                     | Other

- Automated e-mail notification system
  - @ key process steps
  - @ closure

- Process Improvement Initiative tracking
Corrective Action Management (CAM) Process Flow

**PER Initiation and Shift Office Screening**
- Problem Identification
- Problem Evaluation Request (PER) Initiation
- Shift Office Screening

**PER Screening and Senior Management Review**
- PER Screening
- Senior Management Review

**PER Resolution**
- PER Resolution

**PER Closure**
- PER Closure

**Notes:**
- System sends e-mail to originator
- Responsible Manager contacts Originator
- System sends e-mail to originator

1. Problem Identification
2. Shift Office Screening
Problem Identification

- Employee identifies key attributes:

<table>
<thead>
<tr>
<th>Discovery Date/Time</th>
<th></th>
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<tbody>
<tr>
<td>Program/Project</td>
<td>Select One</td>
</tr>
<tr>
<td>Location</td>
<td>Select One</td>
</tr>
<tr>
<td>How Was The Problem Discovered?</td>
<td>Select One</td>
</tr>
<tr>
<td>Description of Concern or Problem</td>
<td></td>
</tr>
<tr>
<td>System Identification</td>
<td>None</td>
</tr>
<tr>
<td>Equipment Identification Number</td>
<td></td>
</tr>
<tr>
<td>Requirement Not Satisfied</td>
<td></td>
</tr>
<tr>
<td>Source Document Number Available</td>
<td></td>
</tr>
<tr>
<td>Immediate Actions Taken</td>
<td></td>
</tr>
<tr>
<td>Recommended Corrective Actions</td>
<td></td>
</tr>
</tbody>
</table>
Trending Based on Key Attributes

- Screening committee assigns trend codes:

<table>
<thead>
<tr>
<th>Causal Code</th>
<th>No Causal Code Selected</th>
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<tbody>
<tr>
<td>ORPS Code</td>
<td>Select One</td>
</tr>
<tr>
<td>Functional Area</td>
<td>Select One</td>
</tr>
<tr>
<td>Work Process</td>
<td>Select One</td>
</tr>
<tr>
<td>ISMS</td>
<td>Select One</td>
</tr>
<tr>
<td>PAAA</td>
<td>Select One</td>
</tr>
<tr>
<td>Consequence Code</td>
<td>Select One</td>
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</tbody>
</table>

Add Causal Codes
Problem Resolution

- Responsible Managers evaluate problem and plan corrective actions:

  - Extent of Condition/ Safety Significance and Generic Implications
  - Remedial Corrective Action
  - Causal Analysis, Apparent Cause and/or Root Cause Analysis
  - Corrective Actions to Resolve the FER
Investigation and Analysis

- Event investigation and critiques
  - Consider human factors
- Root Cause Analysis
  - Consider organizational weaknesses
  - Consider error likely situations and error precursors
Investigation and Analysis

- Event
- Vision, Beliefs, & Values
- Flawed Defenses
- Mission, Goals, Policies, Processes, Programs
- Latent Organizational Weaknesses
- Error Precursors
- Human Performance (Initiating Action)
Results

- Dramatic injury and event reduction
- Robust problem identification and resolution
- Worker safety perception of company has improved significantly
- Worker trust of management high
- Raising issues through immediate supervisor has improved
- Integrated ISMS expectations clear and evident
Tank Farm Contractor Improvement Cycle

*DART 3.6

*DART – Days Away and Restricted Time
Not to scale – For illustration only
Problem Evaluation Request Cycle

PERs Initiated

Number

Year

2001 2002 2003 2004 2005 2006
Employee Concerns Cycle

<table>
<thead>
<tr>
<th>Year</th>
<th>Number ECP Requests</th>
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<tbody>
<tr>
<td>2002</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
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DART and Recordable Injury Cycles

**DART Rates**
Five Year Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases/200,000 Hrs</th>
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<tbody>
<tr>
<td>FY02</td>
<td>1.02</td>
</tr>
<tr>
<td>FY03</td>
<td>1.83</td>
</tr>
<tr>
<td>FY04</td>
<td>3.64</td>
</tr>
<tr>
<td>FY05</td>
<td>2.82</td>
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<tr>
<td>FY06 YTD</td>
<td>0.11</td>
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</table>

**Recordable Rates**
Five Year Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases/200,000 Hrs</th>
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</thead>
<tbody>
<tr>
<td>FY02</td>
<td>3.08</td>
</tr>
<tr>
<td>FY03</td>
<td>3.14</td>
</tr>
<tr>
<td>FY04</td>
<td>5.39</td>
</tr>
<tr>
<td>FY05</td>
<td>3.78</td>
</tr>
<tr>
<td>FY06 YTD</td>
<td>1.54</td>
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Conduct of Operations Cycle

Conduct of Operations Index Frequency

<table>
<thead>
<tr>
<th></th>
<th>FY2002</th>
<th>FY2003</th>
<th>FY2004</th>
<th>FY2005</th>
<th>FY2006 (Year to date)</th>
</tr>
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<tbody>
<tr>
<td>A) Skin and clothing Contaminations</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>B) Procedure Not Followed</td>
<td>11</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C) Procedure Problem</td>
<td>15</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>D) Training Issues</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
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<tr>
<td>E) Management Issues</td>
<td>40</td>
<td>19</td>
<td>12</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>F) Lockout/Tagout</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>G) Work Control Issues</td>
<td>9</td>
<td>11</td>
<td>7</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Contact Information

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For a demonstration of this and other process automation please call:

509-205-7520