

*Day 1 – April 26, 2022*

## Welcome & Agenda

- « Safety
- « Lessons Learned
- « HPI Discussion with WPC
- « Best Practice for Defining Scope of Work
- « Wrap Up

# 2022 Spring Joint Meeting



# Safety

*Bodie – SRNS*





# SAFETY – Distracted Driving

Almost everyone has seen a driver distracted by a cell phone, but when you are the one distracted, you often don't realize that the driver is **you**. To celebrate Distracted Driving Awareness Month, do your part in making the road a safer place to drive by using the following tips:



- Adjust mirrors, temperature controls and entertainment console when you first get into the vehicle.
- Put your destination into your GPS before embarking on your trip.
- Enable your phone's "Do Not Disturb While Driving" feature.
- If you must use your cell phone, pull off the road to a safe area to make the call.

Parents should have a talk with their young drivers about distraction and the responsibilities that come with driving

# Lessons Learned

*Sokolik – SRNS*





## Subcontractor Hand Injury During Overhead Door Removal

### SUMMARY

The consistent and effective use of Human Performance Improvement (HPI) error-reduction tools when performing work, such as peer checking or second person verification, reduces the probability that an active error may cause an accident or injury.

A worker was performing demolition activities on an overhead door and failed to verify or get verification that tension had been released on a cable, resulting in a hand injury when the cable was cut.



### DISCUSSION

Two subcontracted construction employees (S1 and S2) were tasked to remove a 10'x10' overhead rollup door in preparation to close the door opening with a wall. As part of removing the door, two wire cables, which are used in conjunction with the main door spring(s) for smooth operation of opening and closing the door, needed to be removed from the system. First, S1 ascended a ladder to relieve tension on the south side door spring by using a screwdriver to rotate the spring approximately two revolutions. S1 then cut the wire cable. These actions were completed without any issues. S1 then moved to the north side of the door to perform the same operation. S1 rotated the spring to eliminate tension but failed to verify tension was removed from the cable. As S1 cut the cable, it was still under tension, and whipped around S1's hand causing an abrasion. S1 was wearing cut resistant gloves which assisted in avoiding serious injury.

### ANALYSIS

A proper Project Job Safety Analysis was in place for the job; however, preparations for the job could have been better as S1 was not familiar with rollup doors. Discussing unfamiliar tasks more in depth during a pre-job brief would have identified S1 was not familiar with working on rollup doors. Pre-job briefs should also emphasize the importance of verifying steps during work evolutions have been completed sufficiently prior to proceeding to the next steps.

### RECOMMENDATIONS

- (1) Proper preparations (including detailed pre-job briefs) and Job Safety Analysis provide a layer of resilience to ensure all affected personnel are aware of the hazards they will be working around and can add the appropriate layers of defense to avoid an unwanted outcome.
- (2) The subcontractor was wearing the proper personal protective equipment, cut resistant gloves, which reduced the severity of the unwanted outcome, injury.
- (3) Always have a questioning attitude during pre-job evaluations and during work evolutions even for work that appears to be routine, such as removing a rollup door. Always maintain vigilant situational awareness and verify actions during evolutions through peer checks or second person verifications.
- (4) Ensure the individual is qualified for the job or task and possesses the knowledge, skills, experience, and proficiency necessary to perform the task successfully and safely.
- (5) Using a screwdriver was not a contributing factor in this event; however, the following is a secondary recommendation: Using the right tool for the job can help build resiliency into work activities. All future evolutions of this nature should use a specific tool made for adjusting tension on roll up door springs (i.e., torsion spring winding bars).

### REFERENCES

CO 2021-1068

### CONTACTS

Name	Email	Phone	Work Description
Going, Shawn Kevan	Shawn.Going@inl.gov	2085263270	MANAGER, FAC SUPPORT SERVICES
Hampton, Danielle Christine	Danielle.Hampton@inl.gov	2085262989	PERFORMANCE ASSURANCE



# HPI Discussion with WPC

*Petrowski – LANL*





# EFCOG ISM/QA Joint Meeting Spring 2022

## Task ISM-HPI-22-01

### Collaboration with Work Planning & Control (WP&C) Task Team

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MIKE PETROWSKI

EFCOG HUMAN PERFORMANCE IMPROVEMENT TASK GROUP (HPI TG)

LOS ALAMOS NATIONAL LABORATORY - HPI PROGRAM LEAD

APRIL 2022



# Task 22-1

## Best Practice: The intersection of HPI and Work Planning and Control



# Task ISM-HPI-22-01

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## **Task Description**

The EFCOG Human Performance Improvement (HPI) Task Team (TT) and the Work Planning & Control (WP&C) Task Team collaborated to find the best practices on topics that both disciplines use and promote.

This document is a collection of these best practices as determined by team members.



# Task ISM-HPI-22-01

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This best practice will ....

- Document the integration of HPI into WP&C
- Provide some best practices and techniques to apply for tasks such as Post-Job reviews (After action Reviews), writing techniques to incorporate place keeping, HPI tools, critical steps, etc.
- Align ISM wheel with HPI tools (SRS and LANL)
- Emphasize the importance (value added) when HPI is part of WP&C; building resiliency into the process
- Consider - Crosswalk DOE HDBKs
  - [DOE-HDBK-1028-2009 Vol 1](#), Human Performance Improvement Handbook, Volume 1: Concepts and Principles
  - [DOE-HDBK-1028-2009 Vol 2](#), Human Performance Improvement Handbook, Volume 2: Human Performance Tools for Individuals, Work Teams, and Management
  - [DOE-HDBK-1211-2014](#), Activity-Level Work Planning and Control Implementation

# EFCOG WP&C Guidance Document (April 2012)

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## Appendix C. HPI and QA

### Human Performance Issues and Error-Prevention Techniques

- When developing work instructions, Work Planners are responsible for specifying the steps that require verifications or documented peer checks in work packages. The Work Planner is also typically responsible for outlining the methodology and sequencing the work to enable personnel implementing the job to keep track of the process described in the work package.
- A human-performance trap can arise when multiple actions are imbedded in a single step. A particular challenge occurs when there are bulleted sub-steps and the worker tries to perform them together rather than individually. The preferred method is to have only one action per step of the procedure or work instructions.



# EFCOG WP&C Guidance Document (April 2012)

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## **Appendix C. HPI and QA**

### **Human Performance Issues and Error-Prevention Techniques**

- Place-Keeping Practices
- Error Prevention Techniques
  - Remembering and Asking Four Key Questions\*
  - Self-Check
  - Peer Check
  - Three-Way Communications
  - First Check\*
  - Flagging/Robust Operational Barriers
- Critical Work Package Attributes for Ensuring Quality

### **Key Human Performance Points**

- JHA Development
- Task/Discipline Work Instructions

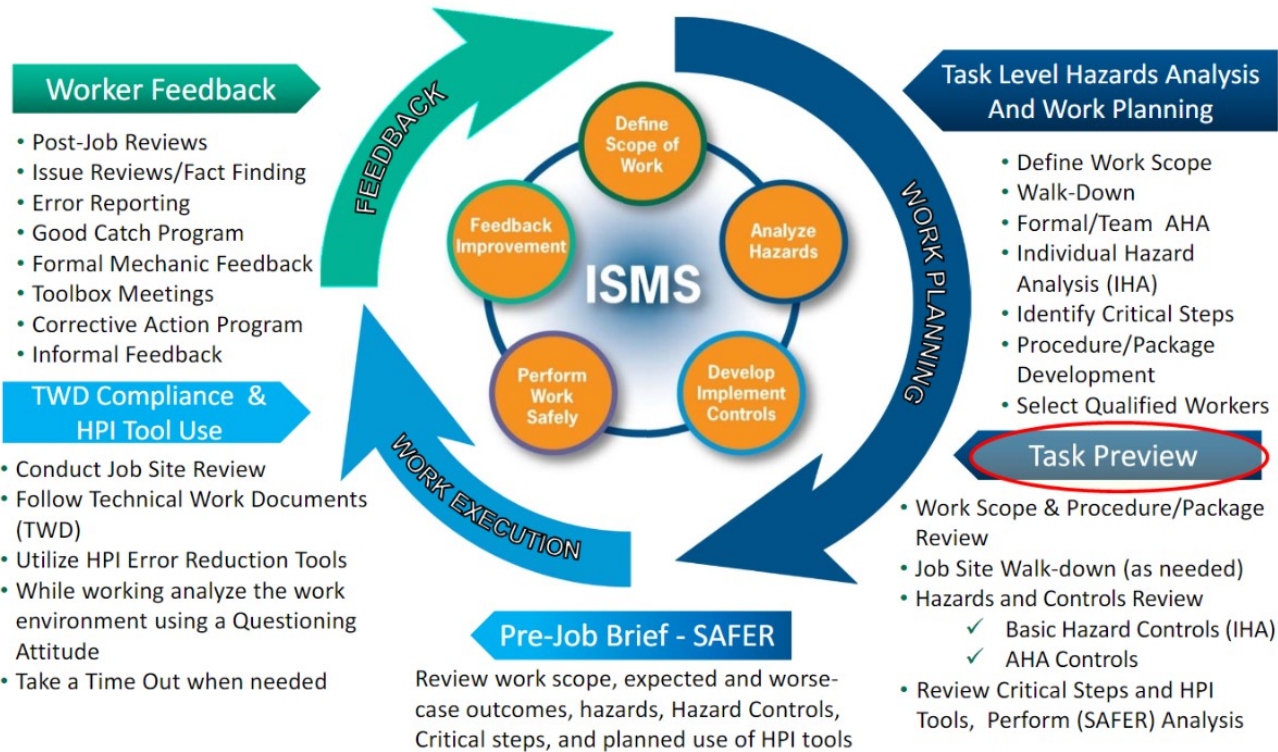
# DOE-HDBK-1028-2009, Volume 1 HPI Handbook, Concept & Principles

Integrated Safety Management	Human Performance Improvement	
ISM Core Function	Reduce Human Error	Manage Controls
<p><b>Define the Scope of Work</b></p> <p>The Task Preview HPI tool supports this core function. It can be used to help eliminate error when reviewing the scope of work. During the task preview individuals who will perform the work:</p> <ul style="list-style-type: none"> <li>• Identify the critical steps (see definition)</li> <li>• Consider the possible errors associated with each critical step and the likely consequences.</li> <li>• Ponder the "worst that could happen."</li> </ul>	<p>When management expectations are set, the tasks are identified and prioritized, and resources are properly allocated (e.g., supervision, tools, equipment, work control, engineering support, training), human performance can flourish. These organizational factors create a unique array of job-site conditions – a good work environment – that sets people up for success. Human error increases when expectations are not set, tasks are not clearly identified, and resources are not available to carry out the job.</p>	<p>When work scope is defined and all the preparation to complete the task is at hand, the error precursors – conditions that provoke error – are reduced. This includes things such as:</p> <ul style="list-style-type: none"> <li>• Unexpected equipment conditions</li> <li>• Workarounds</li> <li>• Departures from the routine</li> <li>• Unclear standards</li> <li>• Need to interpret requirements</li> </ul> <p>Properly managing controls</p>



# Task ISM-HPI-22-01 SRNS

## ISMS / CONOPs / HPI



# Task ISM-HPI-22-01

## ANL – Micro Learning

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Human Performance  
Improvement (HPI) in Action:  
Pre-job Briefings

WPC Program Office

WPC Microlearning:  
Scope and Scope Limits

WPC Program Office

HPI in Action:  
Hazards and Controls

WPC Program Office



# Task ISM-HPI-22-01

## ANL Micro Learning

### Human Performance Improvement

HPI focuses on understanding and mitigating the factors that lead to errors.

HPI consists of tools and concepts to **reduce** errors.

A pre-job briefing is an HPI tool.

### Engagement

Psychological safety is a belief that one will not be punished or humiliated for speaking up with ideas, questions, concerns or mistakes.  
Amy Edmondson, Harvard University



Create a psychologically safe environment



Worker-led pre-job brief




Walk around the room



Speak to the back of the room




Ask open-ended, job-focused questions



Have you attended an effective pre-job briefing?

If so, what made it effective?

If not, what made it ineffective?



# Task ISM-HPI-22-01

## LANL – IWD Formatting

### HPI Tools

- Critical Steps – If performed improperly, WILL cause Immediate, Irreversible HARM
  - Highlight the critical step thru formatting such as bolding, warning statements, color, etc.
  - Identify that this task contains a critical step in the prerequisites, precautions, and limitations section of the work instructions.
  - Consider including a stop or pause point to permit the performer to focus on what must go right as they perform the step or series of steps.

**CRITICAL STEP** highlighted in the  
Precautions/Limitations/Prerequisites

<b>Activity Description/Direction:</b> This work instruction provides an example of how to include a critical step into an IWD. This example work instruction provides instructions for inspection and repair of a multi-stage vertical pump.
<b>List Names of Hazard Analysis (HA) Team:</b>
<b>PRECAUTIONS/LIMITATIONS/PREREQUISITES:</b> (include training/authorizations, approved permits, and area postings)
<b>CRITICAL STEP</b>
1. <b>CRITICAL STEP:</b> Step 6.1: During pump assembly, after the impeller is installed it should be verified that the impellers seat simultaneously.
<b>HPI TOOL:</b> Use dual concurrent verification for feeler gauge measurement and tolerance. <b>Should be as per vendor technical manual recommendations.</b>
2. Permit Required

**CRITICAL STEP** highlighted in the  
Implementation Section

<b>NOTE:</b>	After the next stage impeller is installed it should be verified that the impellers seat simultaneously.
a.	Assemble impeller, thrust collar and associated parts onto the pump shaft.
	<b>CRITICAL STEP</b>
	<b>HPI TOOL:</b> Use dual concurrent verification for feeler gauge measurement and tolerance. <b>Should be as per vendor technical manual recommendations.</b>
b.	Verify impeller seat simultaneously. (Use a feeler gauge and tolerance should be as per $\pm .002$ ).
c.	If impellers do not seat simultaneously, then machine either impeller split rings or impeller base.
d.	Install O-ring onto previously installed bowl.
e.	Install and torque next stage bowl on to previous stage bowl.
f.	Repeat (a-e) above for remaining bowls until pump assembly is complete.

Including HPI tool to be used

# Task ISM-HPI-22-01

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Traditional HPI Tools – still need best practice development

- Self-Checking (STAR)
- Procedure Use and Adherence
- Place-keeping
- Pre-Job Briefing
- Peer-Checking
- Turnover
- Post-Job Reviews
- Observations



# Task ISM-HPI-22-01

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## HPI Concepts and Principles

- Taking the *HUMAN* into account
- Selecting the *RIGHT* HPI tool for the situation
- A *LEARNING* Organization

# Task ISM-HPI-22-01

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Join the HPI Task Team Breakout Session

- Thursday, April 28, 10:00-4:00 EST
- Task 22-1 working session: 2:00 PM EST



# Thank you

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**Michael (Mike) Petrowski**

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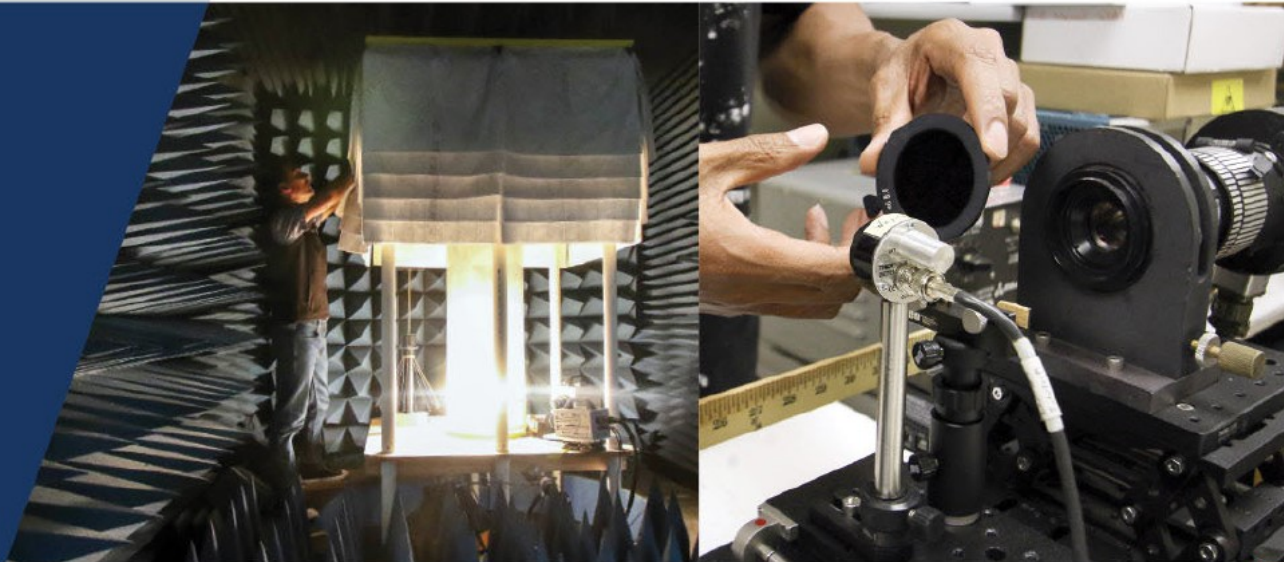
# Best Practice for Defining Scope of Work

*Picard | Nelson - NNSS*

- « Work Request Scope Improvement
- « STAR – SOTW Module Summary



# Work Request Scope Improvement



**Jerel Nelson & John Picard**

Work Planning & Control, Nevada National Security Site.

- ▶ Issues leading up to scope improvement initiative.
- ▶ Importance of well-defined scope of work at the point of work requests.
- ▶ Benefits of well-defined scope of work
- ▶ Impacts of inadequate scope of work
- ▶ NNSS Scope Improvement Initiative
- ▶ Best practices for a well-defined scope of work
- ▶ Work Requests with insufficient SOW
- ▶ Key Take Away



# Issues Identified

- ▶ Several Planning Supervisors noted work requests being submitted with poor SOW. Often these were single sentences SOWs that lacked the needed information for planners to identify the required planning team members.
- ▶ This in turn created circumstances where not all needed scope was included in the work package and created risk that not all associated hazards would be identified, resulting in missed hazard mitigation and controls.

## Poor Work Request Examples

- Power Install Surface high voltage for Project Trailer Park and Relocation area per issued plan package.
- SOW is to remove uninterrupted power supply located within Facility.
- This is to include the repair/replacement of fire bricks/pillows and repairing wall and fire cover in Facility Hoist House



# Impacts of inadequate SOW

- ▶ Delays in Davis Bacon (DB) Determination
- ▶ Incorrect DB determination
- ▶ Required SME's not included
- ▶ Lower quality of planning and execution
- ▶ Negative schedule impacts from scope discovery
- ▶ Hazards/conditions not identified
- ▶ Excessive WP changes
- ▶ Execution issues
- ▶ Lower likelihood of project success.



# Importance of well-defined SOW

- ▶ Increasing the SOW at the point of work request increases the effectiveness/quality of work planning
- ▶ Establishes the foundation for the work planning process.
- ▶ Defines work activities and boundaries in sufficient detail to enable planners and planning teams to incorporate ISMS.
- ▶ Enables production of a high quality ALWCD.
- ▶ Helps to avoid costly rework, and potential schedule delays.
- ▶ Ensures appropriate planning team members are included in walkdown/tabletop



# Benefits of well-defined SOW

- ▶ Ensures stakeholders/planning team are on the same page.
- ▶ Enables realistic timeframes/allocation of resources.
- ▶ Avoids changes in requirements during planning/execution.
- ▶ Reduces potential WP changes that can cause delays.
- ▶ Reduces budget impacts associated with WP delays.
- ▶ Avoids schedule delays.
- ▶ Improves quality.
- ▶ Significantly improves likelihood of project success.

# Scope Improvement Initiative

- ▶ Ensuring that a well-defined SOW is obtained at the point of work request is vital to three of the five core functions.
  
- ▶ **Define the Scope of Work**
  - Obtaining a well-defined SOW at the point of work request helps the planning team to fully define/refine the SOW.
  
- ▶ **Analyze the Hazards**
  - Ensures all required planning team members and SMEs participate in the work planning process which in turn ensures all hazards are identified, and analyzed.
  
- ▶ **Develop/implement Controls**
  - A well-defined SOW at the work request ensures that the required SME's participate in the planning team and hazard analysis process ensuring appropriate hazard controls are developed and implemented.



# Scope Improvement Initiative

- ▶ Work Planning & Control (WP&C) developed a list of items that if received at the point of work request would result in a well detailed SOW.
- ▶ WP&C held initial meetings with a pool of stakeholders that represented, planning management, Facility Engineering, and Project Management to discuss scope improvement.
- ▶ **Immediate relief:**
  - WP&C created an early scope definition checklist, that if used by requestors would ensure the best practices of a well-defined SOW was included in their work request.

# Scope Improvement Initiative

- ▶ A detailed job aid and power point presentation was created thoroughly explaining the “why” and detailing the benefits of a well-defined SOW is available to stakeholders across the NNSS.
- ▶ WP&C launched a communication campaign explaining the the checklist and job aids, and held several briefings explaining the best practice of a well-defined SOW at the point of work request.
- ▶ End users (work requestors) now have resources available to explain what a well-defined SOW consists of, how to incorporate the needed information into their work request, and the benefits of doing so for both planning and the success of their project.

# Early Scope Definition Checklist

## Activity Level Work Request Scope Expansion Job Aid

Draft your work request using the below template, once complete, copy and paste into the work request. The second page contains descriptions of each section to help the requestor understand what they mean.

### Scope of Work

Purpose/scope of work:

Boundaries:

Expected Outcome(s):

Resources:

Points of Contact:

Supporting Documentation:

## Activity Level Work Request Scope Expansion Job Aid

### Description:

**Purpose:** Identify the purpose and type of activity or work being performed, the full range of authorized activities to be performed, as well as the major and/or associated activities required to complete the work. A helpful tip is to answer the "who, what, when, where, and why".

**Boundaries:** The established boundaries for completing the assigned work scope, including closely associated or collocated work activities, systems, or components that are not part of the scope; (i.e. information to help prevent "scope creep")

**Expected Outcome(s):** Desired end state to include: acceptance testing or commissioning requirements to verify completion of the work. A set of pre-defined requirements that must be met to mark an activity as complete in order to be accepted by the user. The Specific statements that define the end state or success of a defined scope of work (i.e. work package)

**Resources:** Resources include items such as manpower, special tools or equipment, or known unique or long lead materials.

**Manpower:** If known, identify the specific craft disciplines required to complete the work. This ensures the proper SME's are included in the planning team and is vital in hazard identification. Additionally, ensuring all craft needed to perform the work are identified by trade, helps to reduce the likely hood needed technical information being missed in the work package. For example, hoisting & rigging, tagging authority etc.

**Special tools or equipment needed:** Any special tools or techniques to be used that could introduce hazards or would require mobilization, procurement or take time to obtain from other work locations.

**Known unique or long lead materials:** If Known identifying unique or long lead materials as early as possible can help to reduce delays during the procurement process.

**Points of Contact:** Points of contact, provides the assigned work planner the appropriate contact information. These may include but not limited to the following.

- Project Manager
- Scheduler
- Superintendent or assigned supervisor
- Design Engineer
- Responsible facility or system engineer
- Procurement representative assigned to support the scope of work

**Supporting Documentation:** List each supporting document applicable to the scope of work. Supporting documents may include but not limited to the following.

- The specific required drawings applicable to the SOW.
- Configuration management documents such as facility change requests, functional classification determinations, commercial grade dedications,
- Equipment manuals
- Design documents such as mining plans, quality inspection plans.
- Project management documentation such as
- Note: If design is not yet available, please indicate the estimated date that design will be issued.

**Note:** A complete, detailed, and accurate SOW establishes the foundation for the remaining portions of the work planning process. A well-defined SOW defines work activities and boundaries in sufficient detail to enable planners and planning teams to incorporate all SMS functional elements and facilitate production of a high quality ALWCD. Additionally, it helps to avoid costly rework, and potential schedule delays due to operational upsets cause by work package changes.

# Scope Improvement Initiative

## Long term solution:

- ▶ Work request process within CMMS will be modified to include the below additional fields of required information.
  - Purpose
  - Resources
  - Boundaries
  - Points of Contact
  - Expected Outcome (End State)
  - Supporting Documentation
- ▶ The required information will ensure that the best practices identified in the scope improvement checklist and job aids are mandatory when submitting work requests within the CMMS at the NNSS.



# Work Requests with insufficient SOW

- ▶ Planning supervisors are encouraged to notify the requestor IF the request is not sufficient or acceptable to perform work planning, to include the information/documentation that is needed to proceed with work planning.
- ▶ Planners are encouraged to return the WO to their planning supervisor, IF the request is not sufficient or acceptable to perform work planning, to include the information/documentation that is needed to proceed with work planning.



- ▶ More information provided during the work request = more effective quality work planning with reduced changes and delays, and reduced time and cost
- ▶ A complete, detailed, and accurate SOW establishes the foundation for the remaining portions of the work planning process.
- ▶ A well-defined SOW defines work activities and boundaries in sufficient detail to enable planners and planning teams to incorporate all ISMS functional elements and facilitate production of a high quality ALWCD.



# Skills, Training, and Assigned Reading (STAR) – Skill of the Worker (SOTW) Module Overview

Jerel G. Nelson

*Division Manager, Work Planning & Control*

4.14.22

# Problem Statement (Current Issues)



- Need to manage and verify skills, training, and required reading per DOE HDBK-1211-2014, ISMS, 48 CFR 970 5223-1, CD-QA.002.001, and CD-1200.004
- Current systems (SOTWS, RR, and TVS) provide functionality, but expertise doesn't exist in IT to maintain or sustain
- Current applications are not integrated and verification of workers qualifications to perform ALW relies on all three applications
- Commercial of the Shelf (COTS) systems were evaluated and too many gaps exist to provide required functionality to support the business process without significant investment
- Need to support the skills, training, and RR business processes for compliance and worker safety
- *Skills, training, and RR need to be identified and verified prior to any ALW being performed to avoid incidents and accidents that have previously contributed to personnel injury and penalties*



# Background/Context



- Skill of the Worker System (SOTWS) developed in 2016 and implemented in 2017 – data was up-to-date
- Execution organizations did not keep SOTW data current (reviews required annually) for 4 years
- Surveillances were performed to drive compliance and performance
- SOTW significant condition issue was identified and self-reported in 2020 and an RCA and CAP developed
- Skills verifications cards were developed and used as a compensatory measure
- Organizations used SOTWS to become compliant and now have a 100% compliance and performance level (all master and individual SOTW records up-to-date)
- Additional functionality was needed to improve the management of SOTW and to help planners identify which SOTW skills are used for specific work packages (WP) and for job supervisors/foreman (JS/F) to verify which individuals have approved skills/tasks to perform SOTW skills/tasks for specific WP, PRIOR to performing work
- STAR-SOTW module developed and implemented to improve sustainability and address functionality gaps, and provide this mechanism and delivery to the JS/F

# STAR-SOTW Module Benefits



- Web-based system that is sustainable and application consolidation
- Will integrate with required reading (RR) and Activity-Level Work Control Document (ALWCD)-specific training identification and verification to ensure we can effectively, accurately, and quickly determine who has the skills, reading, and training to perform specific tasks in an ALWCD
- Joint effort between IT, WP&C, and execution organization stakeholders
- **Manages master and individual SOTW records for the entire site and company**
  - Incorporates functionality needed by Mission Operations and Transportation organizations
  - Provides email reminders to managers/supervisors when master/individual SOTW are coming due, due, and overdue to better maintain compliance
- Links to real-time metrics in PowerBI
- Trained power users (train-the trainer), developed STAR-SOTW module user's guide, and video tutorials
  - Performed numerous training sessions



# STAR-SOTW Module Benefits Cont'd



- Provides ability to identify (and link) SOTW skills/tasks to an individual ALWCD (during work planning) – demonstrating and providing evidence that this was performed
  - *Helps planners determine which tasks/activities are SOTW in a WP so that they can ensure they have the appropriate WP type and level of detail*
- Delivers ALWCD-specific individual SOTW verification reports to JS/Fs 2-days prior to the work being performed (requires no effort on their part)
- Will be integrated into Mobile for Maximo (M4M) in the future so that JS/Fs can have a list of individual workers with the approved SOTW skills/tasks to perform SOTW activities for each ALWCD on their mobile device
- Part of the larger, more strategic effort to move to mobile WPs to improve consistency, standardization, compliance, effectiveness, and performance
- RR module scheduled for completion and implementation late summer 2022 and ALWCD-specific Training Identification and Verification module in early 2023



# STAR-SOTW Module Demonstration

- Brief demonstration of the STAR-SOTW module
- Access STAR (Stage) [here](#)
- Access STAR (Production) [here](#)





# Wrap Up







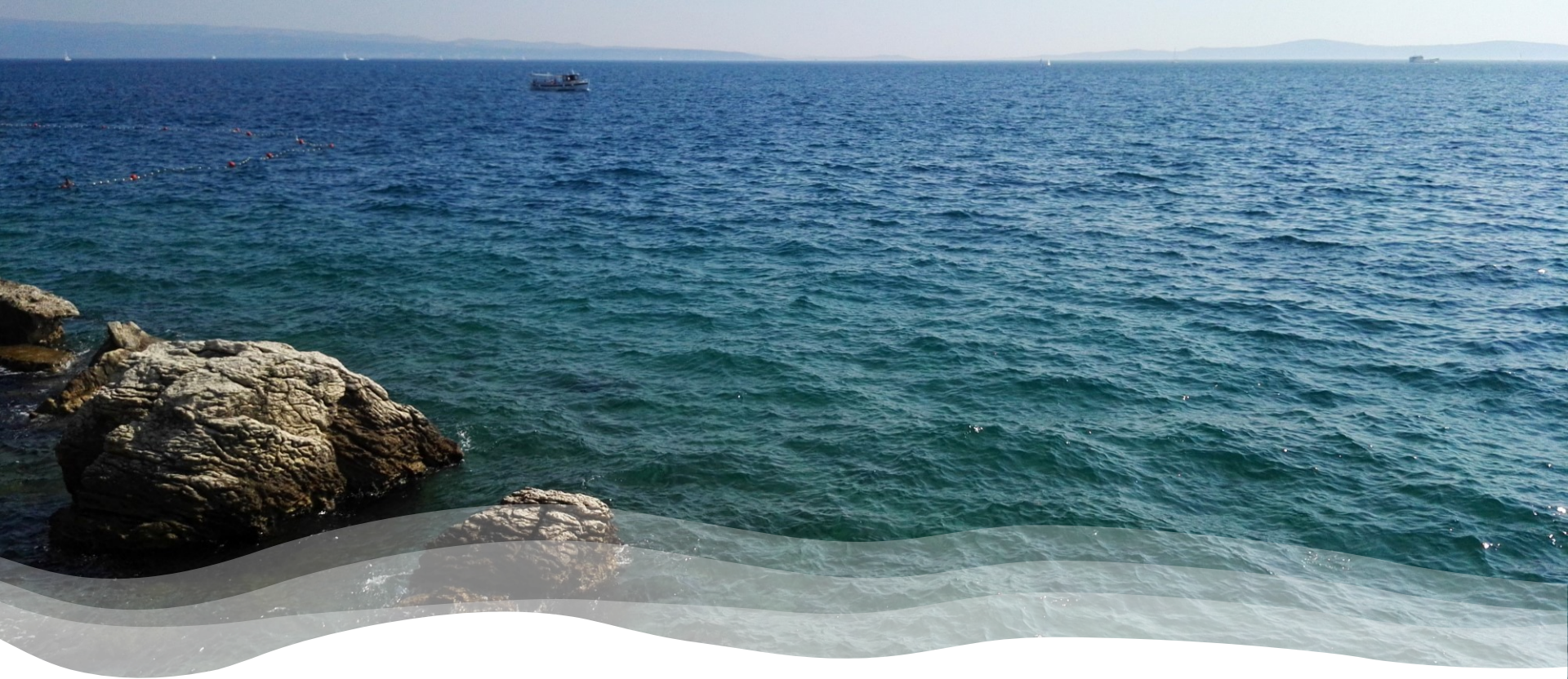
# Work Planning & Control

*Day 2 – April 27, 2022*

## Welcome & Agenda

- « Safety
- « How to Prevent Operational Upsets
- « Utilizing Lessons Learned in Planning
- « Knowledge Workers & HPI
- « Wrap Up

# 2022 Spring Joint Meeting



# Safety

*Bodie – SRNS*



# How to Prevent Operational Upsets

*Haeberlin - NNSA | Barker - EFCOG | Stuart - ATS*

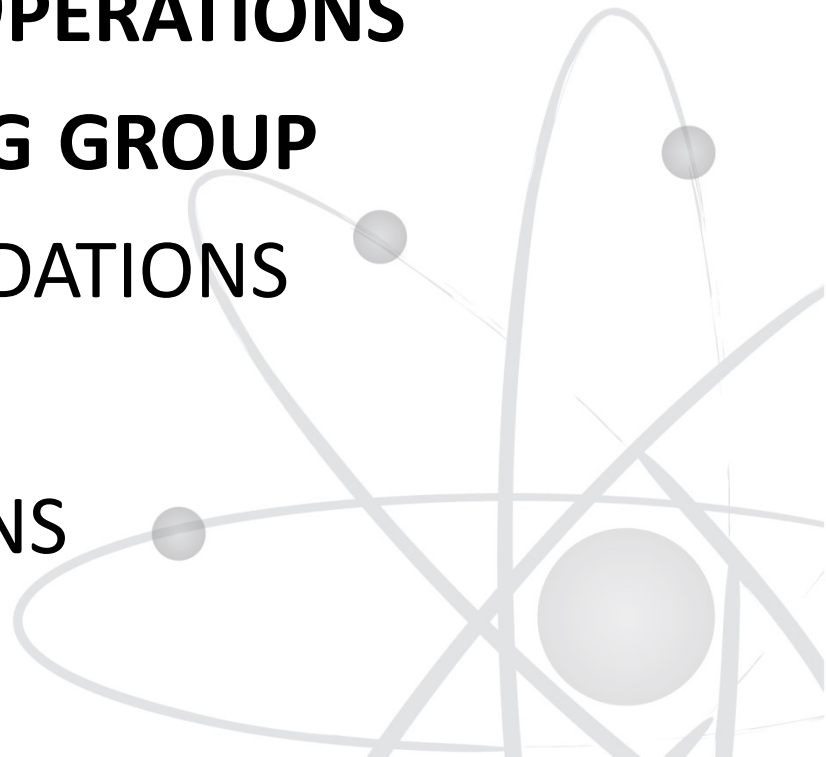




U.S. DEPARTMENT OF  
**ENERGY**



**NNSA**  
**CONDUCT OF OPERATIONS**  
**A3 WORKING GROUP**  
**RECOMMENDATIONS**  
**AND**  
**ACTIONS**



- NA-LL – Doug Eddy (35)
- NA-LA – Sam Wisdom ()/Carl Sykes (36)
- NA-SN – Jim Todd (38)

***More than 350 years of  
Nuclear Operations Experience  
Represented on this team.***

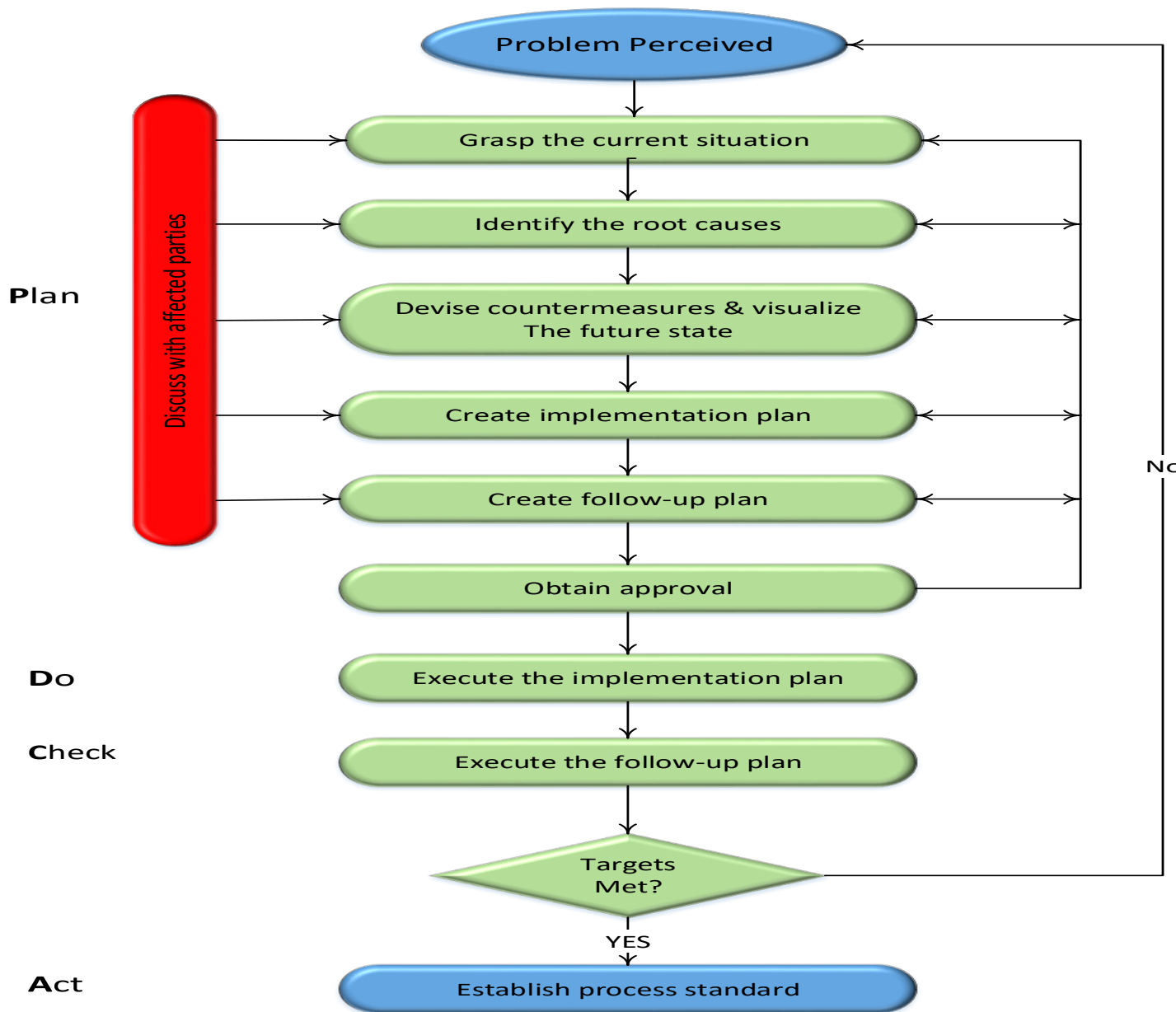
- NA-51 – Jeff Roberson (38)
- NA-50 – Greg Hatchett (20) National & International
- Dan Sigg – Champion and Advisor (30)



## A Basis for Managerial Effectiveness

- The mind set behind the A3 system can be distilled down to seven elements
  - Logical, step-based, thinking process
  - Presenting information in a non-judgmental way
  - Results achieved (expected) and processes used
  - Using only critical information and visualization
  - Alignment of the effort with strategy/objectives
  - Being consistent throughout the organization
  - A systems approach to problem-solving
- Plan-Do-Check-Act (PDCA) is at the heart of this process – Toyota has perfected it
- The Toyota system emerged as they “solved” their problems aggressively and systematically to find a better way to do things, and then rigorously verified that the better way was indeed better
- If the new way improves the system it should then become the standard
- If not, problem solving and verification continue until the problem is satisfactorily addressed

# Toyota A3 Process



A review of events reported in the Department of Energy's Occurrence Reporting and Processing of Operations Information database revealed trends impacting mission operations. Reports over the last 10 years identified reportable events at enterprise sites that have resulted in lost mission work hours due to poor performance of operations. In addition to the direct loss of productive mission hours, other significant costs include investigation, response actions, and retraining, as well as the opportunity costs of these activities. Despite these efforts to correct this performance weakness, there has not been a measurable reduction in these events over the ten-year period analyzed. **Annually over the past 10 years the NNSA enterprise has experienced an average of 173 conduct of operations related occurrences, 71 each year which resulted in work pauses. Corrective action plans have been developed and executed, but to date have not been effective.** The mission lost time due to performance weaknesses should be tracked and targeted for reduction.

Annually, over the past 10 years, the NNSA enterprise has experienced an average of 173 conduct of operations related occurrences, 71 each year which resulted in work pauses. Corrective action plans have been developed and executed, but to date have not been effective.

***These are causes which have emerged  
in the analysis as frequently recurring contributors –***

- Safety/Organizational Culture not Fostering the Needed Conduct at the Decision Point
- Weaknesses at the “first line” Supervisor Level
- Training Process Weaknesses
- PER Process Not Effective in Making Lasting Improvement
- Procedures and Procedure Compliance



## ***Countermeasures to Enhance Success***

- NNSA federal team developed a draft set of recommended countermeasures
  - Could provide all/subset individually to M&Os as determined appropriate by FOMs
  - Could provide as a toolbox in coordination with NA-1 direction memo or NNSA-wide PEMP objective
  - Countermeasures may need refining based on how they'll be conveyed to M&Os

## ***Countermeasures to Enhance Success***

- Enterprise Voice and Presence (Organizational Culture)
- Measure and Monitor for Improvement
- First Line Supervisors and Persons in Charge
- Training Improvements
- Become and Maintain NNSA as a Learning Organization

# Enterprise Voice and Presence (Organizational Culture)

## ***Recommended Actions -***

- Enterprise Voice and Presence
  - Management Voice Drives Culture – speak consistently to the importance of disciplined operations in an NNSA operating environment (high hazard, high value, operational goals)
    - Support/maintain a questioning attitude
    - Sustaining safety culture
  - Be present in the workplace – demand disciplined operations
  - Employ a Senior Supervisory watch at the first indication of a negative trend in operational discipline

# Measure and Monitor for Improvement

## *Recommended Actions -*

- Include Disciplined Operations language in a PER Measure (PO 6)
  - Specific Performance Objective related to disciplined operations
- **Objective-6.X Demonstrate performance results through the identification and improvement of recurring disciplined operations weaknesses that have resulted in historical work pauses leading to decreases in overall programmatic schedule and cost efficiency. (must be given weight)**
- Use a Common NNSA Approach to Assess Safety Culture and Conduct of Operations

# First Line Supervisors and Persons in Charge

---

## ***Recommended Actions -***

- First Line Supervisors (task leads, PIC, work leaders, etc.)
  - Enhance conduct of operations training for these key leaders
  - Reenforce continually the importance of this position at the point of decision
  - Move to a “hands-on” training modality whenever possible
  - Consider incentivizing this position



## *Recommended Actions -*

- Training for Operations and Maintenance Personnel
  - Train on “Basis for Requirements”
  - Training on maintaining a questioning attitude
  - Move to a “hands-on” training modality whenever possible
  - Joint, on-site hazard evaluations with work planners
  - Recognition that “safe work” is a force multiplier for mission execution – it is the better, more cost effective, and faster way to “Get the job done!”

# Become, and Maintain NNSA as, a Learning Organization

## *Recommended Actions -*

- Become and Maintain a Learning Organization
  - Any repeat event need more detailed analysis
  - Actions to correct must be evaluated
  - System and Worker-Interface contributions to potential errors must be evaluated and corrected

## Next Steps

- Determine best method to convey countermeasures to M&Os (direction/CPEP incentivization/other)
- Seek M&O review/input on countermeasures
- Refine and implement countermeasures



- Questions?

# EFCOG ISM&QA

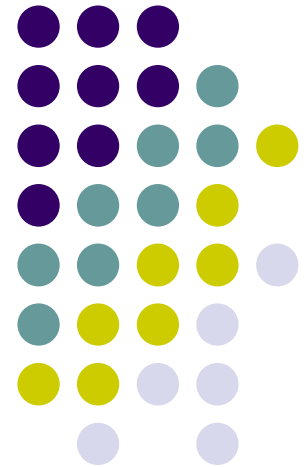
## NNSA Performance

### Expectations in

# Conduct of Operations

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Establish Consistent approach to Objective 6.5 – Demonstrate improvement in formality and rigor for Organizational Culture in Conduct of Operations through the institutional implementation of effective and efficient counter measures.





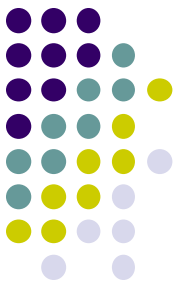
# NNSA Problem Statement



- Annually over the past 10 years the NNSA enterprise has experienced an average of 173 conduct of operations related occurrences, 71 each year which resulted in work pauses.
- Corrective action plans have been developed and executed, but to date have not been effective.
- The mission lost time due to performance weaknesses should be tracked and targeted for reduction.

# Operations Upset Causes

## Typical Examples



- Communications-Emergency Communication Timeliness
- Radiological Contamination that indicates migration or unknown condition (on-site)
- Type A Incident of Security Concern
- Loss of authority to operate any information systems, software or hardware
- Unrecognized Schedule or costs overruns
- Failure to ensure engineering baseline documentation is correct and supports project/mission execution
- Failure to properly plan for mission introduction into managed nuclear or High Hazard facilities resulting in non-compliance with regulatory requirements (environmental, security, safety, etc.) not being met.
- Changes to permitted water system without State Approval
- Equipment failure during activity performance without adequate backup equipment
- Work stoppage by Union Workforce

## EFCOG ISM & QA Task Approach



- Focus on Addressing Performance Expectations of Objective 6.5
  - Demonstrate improvement objectives in formality and rigor for Organizational Culture in Conduct of Operations through the institutional implementation of effective and efficient counter measures.
  - This includes improved safety culture, safety conscious work environment, measuring and monitoring to show improvements, supervisory involvement, improvements in training, and working towards a learning organization.
- Key Strategic Approach includes:
  - What the NNSA expects is to minimize Interruptions in delivery of mission which has plagued most sites in the NSE complex.
  - Focus-What stops Mission Delivery, and the idle costs must be eliminated/reduced in a significant way.
  - A Preventative approach is required.

# Specific Areas of Attention



Address the specific performance areas in 6.5

- Demonstrate improvement in formality and rigor for Organizational Culture in Conduct of Operations through the institutional implementation of effective and efficient counter measures. This includes improved
  - Safety culture,
  - Safety conscious work environment,
  - Measuring and monitoring to show improvements,
  - Supervisory involvement,
  - Improvements in training, and
  - Working towards a learning organization

# EFCOG ISM&QA Team



An Integrated ISM&QA Team Is Being Initiated With Expertise In:

- WP&C and COO Supervision
- Contractor Assurance
- Quality Assurance
- Safety Culture
- Human Performance Improvement
- Issue Management Performance
- Measuring and Monitor Improvement
- Training
- Learning Organizations



# Task Leadership and Sponsors



- Task Leadership Vince Grosso EFCOG QA Lead (MSTS) & Norm Barker EFCOG CAS Lead (BGS)
- EFCOG ISM&QA Vice Chair Omar Cardona-Quiles (SRS)
- NNSA Sponsor Jeff Haeberlin (NNSA)  
EFCOG Senior Sponsor David Martin Director Quality /Contractor Assurance (MSTS)
- Specialist Leads
  - TBD

# Task Status & Schedule



4 Task Meetings Scoping Discussions -Complete

3 NNSA Contractor Presentations & Inputs-Complete

- MSTS - Operational Upsets MSTS Implementation
- SRTE-Con Ops Management
- CNS -Approach to Conduct of Operations Improvement

## Schedule

- Scoping and Plan Development May 2022
- Team Assembly and Leadership Commitments May 2022
- Specialty sub teams draft analysis June-July 2022
- Draft recommendations August 2022
- Review and Approval September 2022
- Completion & Issue Results October 2022

# Limited Condition of Operation (LCO) and Lockout Tagout Step

*Bruce Stuart - Amentum*

# LCO and LT Step

- **Work Instructions**
- **LW Form – Work Order Impact Review Sheet**

Asset Suite Information

Date Created 04/07/2022  
Planner Name Goodman, Robert  
Planner Telephone  
Equipment Name  
Facility FTF  
CLI Number  
Functional Class PS

1.0 Scope of Work:

Describe the scope in sufficient detail to ensure understanding by the reader. Ensure the equipment description is clearly delineated here including the boundaries of the scope by which the hazards were analyzed.

*Planner – Include photo here if available using jpg files.  
Click in box, Select Picture, Insert Picture and then resize box by dragging bottom corner up. Or delete box and paste pic using snag-it. (Snag-it compresses the pic and eliminates the need to reduce jpg*



*(Planner - enter document numbers, N/A any field not required or delete any unused fields as applicable)*



WORK ORDER IMPACT REVIEW SHEET

Work Order Number: [REDACTED]

1. Scope of Work/Equipment Affected (Planner / Initiator):

[REDACTED]

2. System Impacts (Operations):

[REDACTED]

3. TSR Review (Engineering):

LCO Number	Condition	Comments (limited to 300 characters)
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

4. Compensatory Measures (Operations):

[REDACTED]

5. Reviewers:

printed name

signature

Engineer: [REDACTED]

[REDACTED]

Date: [REDACTED]

Operations: [REDACTED]

[REDACTED]

Date: [REDACTED]

STE: [REDACTED]

[REDACTED]

Date: [REDACTED]

SOM: [REDACTED]

[REDACTED]

Date: [REDACTED]

WORK ORDER IMPACT REVIEW SHEET  
Continuation Page

Section 2 – System Impacts (continued)

██████

Section 3 – TSR Review (continued)

LCO Number	Condition	Comments
██████	██████	██████
██████	██████	██████
██████	██████	██████
██████	██████	██████

Section 4 – Compensatory Measures (continued)

██████

WORK ORDER IMPACT REVIEW SHEET

Instructions and Responsibilities for Completing the Impact Sheet for Work Packages

**NOTE:** A continuation sheet may be used if necessary.

1. Work Order Number to be completed by planner/initiator. Each task that has different impacts should have a separate review. If the sheet covers the entire Work Order then one sheet will suffice.
2. Block 1 to be completed by Planner/Initiator clearly depicting the scope and equipment (CLI) affected.
3. Block 2 to be completed by Operations Reviewer or designee and should specifically identify the impacts to all systems affected by the work.
4. Block 3 to be completed by Engineering as titled in each requested column. Any assumptions should be captured in the comments section.
5. Block 4 to be completed by Operations Reviewer or designee.
6. Block 5 to contain Engineer and Operations reviewer name (signature may be obtained by package approval). This identifies who completed the form. The STE and Shift Operations Manager (SOM) review signatures indicate they have reviewed the information and used it and the current plant status to take appropriate actions.



# Utilizing Lessons Learned in Planning

*Goodman – SRMC*





# WP&C Briefing Lessons Learned

Robert Goodman

*April 2022*



- During performance of [2020-SA-004166](#) the assessor interviewed 4 planners and questioned the use of the Lessons learned Data Base. One planner stated he was not sure how to access or where the Site Lessons learned data base was.
- FINDING NO. 1 - WO#1798906 - The planner interfaced with engineering and reviewed past work history when developing the package. This is acceptable considering the scope. However, the planner stated he didn't review Lessons Learned databases during preparation.

Recommended Corrective Action: Ensure planner review Lessons Learned databases during preparation of packages.



- Planners and Work Control Management shall continuously evaluate the work control process, including the performance of work and recommend improvements to individual work packages or the WP&C process. Examples include:
  - A. Stop work documentation
  - B. Pre/Post Job Brief comments
  - C. **Lessons Learned**
- Methods and considerations for development of work instructions and permits [S/RID 4]:
  - Electronic search of the Lessons Learned (LL) database: (SRS Intranet/Lessons Learned/Search Page)

- **5.1.4 Planning Process**

- 1. Team Planning can be documented using the attributes section in WMS.
- 2. Develop Work Plan. (Appendix 8.7, Develop Work Plan)
- 3. **Research the WMS History, Lessons Learned, Near Misses, etc.**

- **11. Other planning considerations include:**

- • Inclusion of applicable hazards and controls
- • **Electronic search of the Lessons Learned (LL) database**

- **U. Work Planner Function**
  - Revisiting work packages greater than 6 months old to ensure lessons learned are incorporated into new revisions of AHA, PWIT, etc., and are considered in the package, and to ensure the latest revisions of forms and permits are incorporated

- LESSONS LEARNED I considered formal lessons learned as applicable to this job. I reviewed similar or previous work history and any work order feedback (CO)

# WP&C . WORK ORDER CHECKLIST



Effective 1/28/2020		Planner	Date
Rev. 27	Work Order		
KEY WORDS	N/A	WORK ORDER CHECKLIST ✓	
DEFINE SCOPE	I performed an initial walk down of the job site to identify hazards and to clearly define the scope of work. If the task to be performed is determined to be complex (requires multiple work groups), non-routine or has never been performed before, or the task requires entering environments where unknown hazards may exist, involves multiple hazards, or recent performances of the task have resulted in accidents or safety health concerns, I included a team for the walk down and planning meeting to identify hazards and clearly define the scope of work.		
DAVIS BACON	I entered my Davis Bacon review in Attributes and put supporting info on Tab 2. I placed an LSR hold code on work package at the work order level if the estimated cost is greater than \$2000.00. LSR Hold Code not required for PM work.		
LESSONS LEARNED	I considered formal lessons learned as applicable to this job. I reviewed similar or previous work history and any work order feedback (CO)		
AHA	I verified the work package was routed in Asset Suite to all SME's required by AHA, and TY 8.20. Performed Team AHA, if required.		
DETAILS	I provided enough details in my instructions to clearly define and communicate the scope of work. I did not include steps in the work package to contact an individual to guide work while it's being performed in the place of specific instructions. Included LOO entry step from template and IRS in accordance with SA-OPS.14. If task was back grounded from previous task, I ensured that the steps are updated to match current template.		
PM	I reviewed for active PMs against this work order. If applicable, notified the PM coordinator of this open work and added a step to reset the due date after completion.		
RECORDS	I entered a RSM# at the Work Order Level on the Attributes Panel (Ref Work Package Record Retention Guide).		
ROUTING	I routed the work package to applicable reviewers as required by TY 8.20 and 80 122 and SA-OPS.14 (OSR 46-742).		
RESTRAINTS	I entered the applicable hold code in Asset Suite for any work package task restraint (Hold code list in HTF WC Web Page).		
RESOURCES	I included the applicable resource codes (Example QA, RCO, IM, IH, etc.) and equipment codes (Cranes, Man lift, LR Plan, etc.) in Resource tab. I reviewed the history and estimate of the last work order to help me accurately estimate work.		
DOCUMENT ID	I included checks on Tab 2 and Tab 5 for all documents that would be records for the final work package.		
INSPECTIONS	I included B31.3 and fluid service category in the applicable section of the Maintenance Instructions if B31.3 applies. I included specific criteria in my inspection points. See ENG.18 for inspection criteria. B31.3 is designated as a 'D' for Maintenance Programs on panel TIMM117 in Asset Suite.		
MOD/TEMP MOD	I included the applicable steps in the work package for Mods and Temp. Mod. Installation/Removal. I verified the work order task 'Job Type' was identified as a Modification 'MOD'.		
FABRICATIONS	I included code requirements for flushing/wetting manifolds/adapters and lifting devices. I created a UTC number and instructions to affix labeling and identified and notified PM Coordinator/Engineering to consider PM requirements.		
FIRE PROTECTION	For hot work I have included the following step in the work instructions: Notify Shift Manager that Hot Work is complete and Ensure closure of Part 5 of the Hot Work Permit is complete		
CONDUCTIVITY PROBES	I listed the crimp tool for conductivity probes in the Special Tools section when my instructions cover the fabrication of probes. Included the appropriate surveillance procedure for probe set point verification.		
TANK / DIVERSION BOX OPENING	If port plugs or riser plugs are required to be removed I included the diameter, weight of the plug AND closure instructions in compliance to 2016-CTS-009664 in the work instructions.		
299H SHIPPING EQUIPMENT WAC	Prior to transporting to 299H I have generated a WRWO referencing the required Waste Compliance Plan Transfer Report (WSRC-TR-00068 or SA-OPS.D1), SW26.1 Transport Manual, i.e. Section 4.9 procedure or other applicable section and OSR 46-739		
NEWLY GENERATED NON-ROUTINE WASTE	If this package may generate non-routine waste that may usually require characterization from the WCE and normally is placed into drums, sealands, 5-12/8-25's or special containers other than standard waste then complete OSR 46-747 before completing planning of MIs.		
ALL CONTAINER INSPECTION, LOADING AND CLOSINGS	I have generated a WRWO and attached the required OSR 46-739 (SRR PACC form). If transporting on site roadways I have reference SW 26.1 Transport Manual, i.e. Section 4.9 procedure or other applicable section in the WRWO		
CELL COVERS/ VALVE BOX COVERS	If the work involves installing a cell cover or valve box cover over valves that will need to be manipulated from above, I included a step to verify accessibility prior to the work being completed. I included a step in the work instructions to ensure no combustible materials have been added to or left inside the cell, valve box, pump pit, etc. prior to installing the cell cover.		
HIGH POTENTIAL SEALAND	If the job requires a High Potential Sealand, I included the High Potential Sealand checklist (OSR 46-294) in the work package. This checklist includes steps to prevent and contain spills or the spread of contamination from the container. Items are identified to specific containers in work instructions (299).		
EMERGENCY ACCESS ROUTES	If the work included activities that would restrict emergency vehicle access within the Tank Farm, such as staged equipment (cranes, etc.) or excavations, I included a sign off step requiring that the SM be made aware of the access restriction prior to allowing the restriction to occur. I also included a step to notify the SM once the restriction is removed. STAR #2005-CTS-6075.		
ENVIRONMENTAL COMPLIANCE AUTHORITY	I reviewed this list of activities and routed the package to the ECA for review if any of the activities were included in my package: excavation/work within 25 feet of septic tank system, 20 feet of groundwater well, or within 200 feet of RCRA/CERCLA unit or Site Evaluation Area; excavation that could result in erosion; work on domestic water distribution system outside of building; work on a portable restroom; demolition or renovation of a building. Demolition/renovation work has to be reported to SC2HEC.		
TANK TOP LOADING	If equipment is being placed on a waste tank top/secondary containment, diversion box, or pump pit, I ensured the loading requirements in procedure ENG.25 have been met. I submitted OSR 46-531 to the structural Engineer if applicable.		
INSULATION/ASBESTOS CONTAINING MATERIAL	Appropriate insulation steps/guidance (from template) is/are included. Request has been made to have insulation tested, if required. Work Packages replacing/repairing wallboard, ceiling tiles, floor tiles, piping and insulation or any other potential asbestos containing material (ACM) must have an inspection and be sampled, as applicable, prior to any work being performed.		
STORED ENERGY THAT CANNOT BE LOCKED OUT	I have considered hazards NOT clearly identified on the hazard tree and entered them in question 900 of AHA. To include items related to stored energy sources that cannot be locked out such as: Springs, Capacitors, Gravity, Pneumatic/Hydraulic hazards		
SIPHON EVALUATION	If there is a potential cross connect between water systems shown on table 9 of M-ESR-G-00080 and tank contents then route to engineering for approval and add USO-required Yes/No to attributes in Asset Suite		

- **Review work history on the CLI and/or similar scope.**
  - 3/28/2022
  - Maintenance attended pre-job to lower Tank 44 LVMJs. SOM released work permit and workers signed onto the L/T. RTV was removed from the LVMJ and Rigging lowered the Riser B2 LVMJ to (289" pin location 10) per engineering direction. RTV was then applied to seal the LVMJ penetrations. Work area was housekept.
- **Check for COs (Correction Of Record)**
  - Facility: WPT Description: TK 43 FAB / REPLACE DEMISTER HM-241943-HV-DMST-1 CONTINGENT (30)
  - Feedback: When removing the roof for demister replacement, the step for removing roof needs to be under prerequisites so that roof can be removed to install the weather hut. Then at the end of package, the roof can't be installed until the weather hut is removed.
- **Search logbook (Maintenance/Planner)**
  - Location - TK 14
  - CLI - HL-241914-WTE-TW-3060
  - As Found / Purpose - T/C Junction Box Inspection
  - Comments - E&I identified cable conductor entering and exiting JBX by number and insulation color. Identified each wire landed on terminal in JBX. Took pictures and made a drawing for identification. All SAT
- **Consult senior planners/workers**



## • Data base screen shot



Welcome, Robert Goodman

Search Op.Ex

Reset

enter search criteria

### Operating Experience Program Search Page

Type of Publication:  All  First Alert  Best Practice  Bulletin  Digest  Directive  FDP Specific  News  Notification  Product Information Notice  Special Information Notice

Company:  All  SRS  DOE-SR

Focused Observation Category: + All Focused Observation Categories

Activity: Maint.

Hazards: Noise  
Radiation/Contamination  
Slips & Trips  
Toxic Material  
Power Tools  
Traffic

Keyword: Overhead  
PAAA  
Packaging  
Personal Protective  
Equipment  
Personal Equip

Text Search:

Or

Or

LL Report #: YYYY-LL-####

Date Interval From: 01/01/2000

02/15/2022

- Search results

Search Parameters:

Publication: All  
Company: SRS  
Activity: Maint. - Heavy Equipment  
Keyword: Overhead  
From Date: 01/01/2000  
To Date: 02/15/2022  
Count: 3

« 1 » Go / 1 1 - 3 of 3

**2003-42**  
Date: 07/17/2003  
Title:  
Summary: On 06/24/03 at the Savannah River Site, a Shaw Box 30-ton crane was being used in 717-F when a 480-volt electrical wire (approximately 60-feet long) broke from the eyebolt connection (see Attachment 1) and fell toward the floor. The hanging wire did not extend down far enough to come into contact with personnel or equipment at floor level. However, the potential existed for the wire to have fallen closer to the ground, possibly contacting personnel or equipment. The wire that broke is a bus bar wire that carries the power to the trolleys. Other span wires and the power collector slides were visually inspected after this incident and no problems were detected. Functional tests were performed on the trolley, all auxiliary hoists, and the bridge with no problems detected.

**2004-LL-0101**  
Date: 10/07/2004  
Title: Grove Rough Terrain Mobile Crane Swing Lock Mechanism Maladjustment (SRS)  
Summary: On 9/14/2004 during an inter-area movement of a Grove 80-ton rough terrain crane at the Savannah River Site, the positive swing (house) lock disengaged. This allowed the crane boom to swing approximately 2-4 feet to the left of the crane. The overhaul (headache) ball struck an adjacent stop sign. There was minimal damage to the sign and no damage sustained by the crane, or injury to personnel. However, potential existed for more serious damage to equipment or personnel injury due to the unexpected crane boom movement. In preparation for the crane movement, the crane operator had engaged the positive swing lock and the swing brake mechanism. However, once the positive lock disengaged, the swing brake was not adequate to overcome the resulting applied forces of the crane movement. An incident critique revealed less-than-adequate knowledge and understanding relative to the positive swing lock mechanisms and necessary adjustments on Grove R/T models, 522, 980, and 990 mobile cranes. An immediate travel suspension for these types of cranes was put into effect pending a briefing with all mobile crane operators and crane supervisors regarding proper adjustment and engagement of the positive swing lock mechanism. See Attachment 1 for Swing Lock pictures (engaged and disengaged) and swing lock adjustment knob.

**2006-LL-0072**  
Date: 10/03/2006  
Title: Fatality at BP Texas City Refinery Involving Man Lift - Emphasizes Man Lift Use, Training, and Procedure Guidance (Texas City Refinery - BP)  
Summary: While operating a JLG-brand aerial lift (man lift), a BP (originally British Petroleum) contractor employee was fatally injured when he was compressed between the platform control panel of the lift and a 10-inch I-beam. Although there were three co-workers in the area, there were no known eye witnesses to the actions leading up to and causing the fatality. According to testimony, the equipment operator was found in a compromised position by the co-workers. The crew was involved in the task of installing and welding structural steel about 10 meters off the ground. A man lift was used to access the area, transport tools and materials, and facilitate setting and tightening bolts. See Attachment 1 for a BP Summary

- **Questions:**

# Knowledge Workers & HPI

*Petrowski – LANL*



# EFCOG ISM/QA Joint Meeting Spring 2022

## Task ISM-HPI-22-02

### HPI for Knowledge Workers

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MIKE PETROWSKI

EFCOG HUMAN PERFORMANCE IMPROVEMENT TASK GROUP (HPI TG)

LOS ALAMOS NATIONAL LABORATORY - HPI PROGRAM LEAD

APRIL 2022





# Task ISM-HPI-22-02

## Task Description

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This document is a collection of these best practices as determined by team members.

This best practice will:

- Realize opportunities to break the myth where people believe that HPI does not apply to them as they perform no physical work
- Recommend options to create an environment that promotes intellectual collaboration and trust, enabling candor and vulnerability thereby protecting the asset (people, facility, national security information, and reputation) from harm .
- Explain how errors manifest differently from the same human fallability. Knowledge workers (KW) have different types of errors that take unique perspectives to find and mitigate the unique manifestation of these conditions .
- Help KW identify the critical steps (or risk important steps) in their processes.
- Reduce risk/consequence from KW errors (limit latent errors as well as finding latent conditions), building resiliency into KW tasks. Mitigation strategies may be different.

# Task ISM-HPI-22-02

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## WHO is a Knowledge Worker?

- Knowledge workers are workers whose main capital is knowledge. Examples include programmers, physicians, pharmacists, architects, engineers, scientists, design thinkers, public accountants, lawyers, editors, and academics, whose job is to "think for a living." [Wikipedia]
- An individual who primarily develops and uses knowledge or information (e.g. scientist, engineer, manager, procedure writer). [DOE-HDBK-1028-2009]



Knowledge workers must employ a combination of [convergent](#) and [divergent thinking](#) as part of their work

# Task ISM-HPI-22-02

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## WHO is a Knowledge Worker at DOE?

- Engineers
- Scientists, Researchers
- Procedure and Work Instruction Writers
- Project Management, Planners, Schedulers
- Assessors, Auditors, Event Investigators
- Instructional Designers (Developing Training)
- Emergency Preparedness
- Information Technology
- Budget, Purchasing, Contracts



# Task ISM-HPI-22-02

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## How is a Knowledge Worker different?

- Knowledge workers have expertise in their fields, and they stay current on theoretical and practical applications in their fields.
- Knowledge work requires formal education and incorporates theoretical knowledge in the creation of new information.
- Engineers and other knowledge-based workers contribute differently than first-line workers to facility events



# Task ISM-HPI-22-02

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## How is a Knowledge Worker different?

- The errors made can become significant if not caught early
- A study completed for the Nuclear Regulatory Commission (NRC) by the Idaho National Engineering and Environmental Laboratory (INEEL) indicates that human error continues to be a causal factor in 79 percent of industry licensee events.



# Task ISM-HPI-22-02

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## Knowledge Worker challenges

- **Difficulty Seeing One's Own Error:** Engineers and some knowledge workers, by the nature of their focus on producing detailed information, can be especially susceptible to not being appropriately self-critical.
- **Assumptions:** Knowledge workers must resist inadvertently treating an assumption as fact or forgetting that they made the assumption.

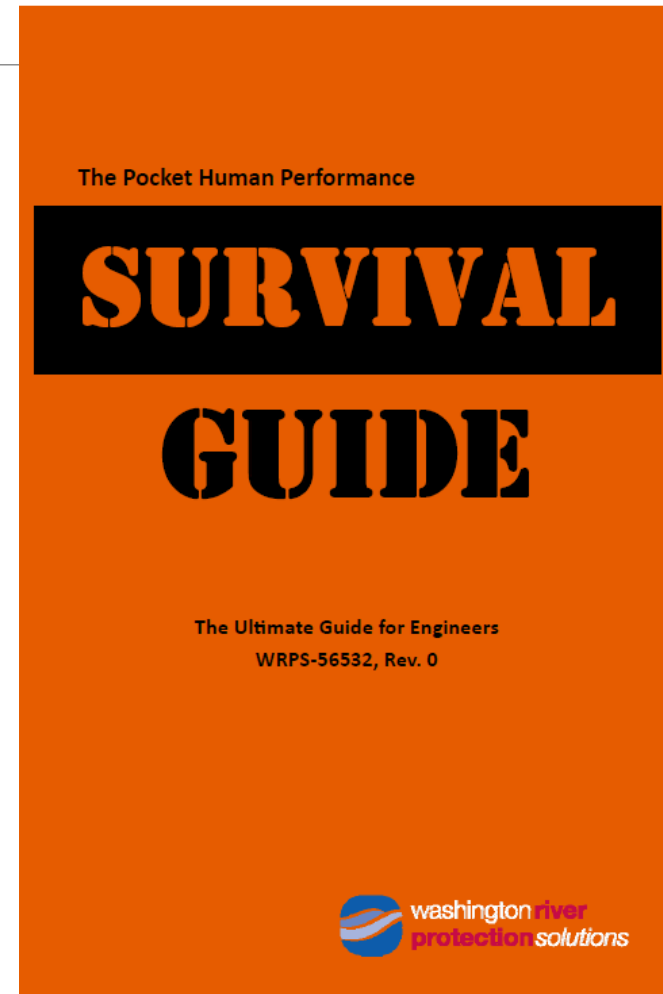




# Task ISM-HPI-22-02

## Knowledge Worker HPI Tools

- Technical Task Pre-Job Brief
- Self-Checking
- Questioning Attitude
- Validate Assumptions
- Signature
- Project Planning
- Vendor Oversight
- Do Not Disturb Sign
- Peer Review
- Problem Solving
- Decision Making
- Product Review Meeting
- Technical Task Post Job Review
- Work Product Review



# Task ISM-HPI-22-02

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Join the HPI Task Team Breakout Session

- Thursday, April 28, 10:00-4:00 EST
- Task 22-2 working session: approximately 2:30 PM EST



# Thank you

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**Michael (Mike) Petrowski**

LANL Human Performance Improvement Program Lead,  
IQPA-PA

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# Wrap Up

