Pantex High Reliability Organization Implementation

Safety Culture – Taking ISM to the Next Level
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Dr. Hartley is currently the primary lead for developing High Reliability Organization (HRO) implementation for Pantex and for implementing an improved Causal Factors Analysis process for organizationally rich, yet non-consequential events.

Dr. Hartley received his
- Ph.D. in Nuclear Engineering from the University of Texas at Austin
- M.S. in Nuclear Weapons Effects from the Air Force Institute of Technology
- B.S. in Physics from Texas A&M University.

He holds Professional Engineering Licenses in Environmental Engineering in:
- Ohio
- Texas
What is a High Reliability Organization?

An organization that repeatedly accomplishes its high hazard mission while avoiding catastrophic events, despite significant hazards, dynamic tasks, time constraints, and complex technologies.

Key to becoming an HRO is to learn from your organization’s mistakes.

- Pantex Causal Factors Analysis process a key tool to organizational learning.
The U.S. Nuclear Deterrent is Essential
- Deters threats from weapons of mass destruction
- Assures our allies of their security
- Dissuades potential adversaries from threatening U.S. interests
- Defeats potential adversaries if not deterred

Value of U.S. Nuclear Deterrent isn’t the number of warheads but the **credibility of our capabilities** in the minds of those we seek to deter, dissuade, or assure

To achieve its psychological and political objectives, deterrence requires nuclear capabilities to be **visible** and **credible**

Although the DoD delivers the U.S. Nuclear Deterrent
- The Pantex delivers and protects the weapons
- Pantex is a essential part of the U.S. Nuclear Deterrent!
- Pantex has no option except to be an HRO
Pantex – A System Within the Larger Nuclear Deterrent System

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Fundamental HRO Practices
A Systems Approach to Avoid Catastrophic Accidents

- Ensure system provides safety
- Manage system, evaluate variability
- Foster culture of reliability
- Model organizational learning

HRO Practice #1
Manage the System, Not the Parts

- Generate decision-making info
- Tiered approach
- Refine HRO system

HRO Practice #4
Learn & Adapt as an Organization

- Provide capability to make conservative decisions
- Make judgments based on reality
- Openly question & verify system

HRO Practice #2
Reduce Variability in HRO System

- Deploy system
- Evaluate operations – meas. variability
- Adjust processes

HRO Practice #3
Foster a Strong Culture of Reliability
Pantex’s HRO Journey
(safety culture initiative integrated into HRO efforts)

2001 – BEHAVIOR BASED SAFETY

2005 – REINVIGORATED INTEGRATED SAFETY MANAGEMENT
  Framework for all safety at Pantex

2006 – DEVELOPED FOUNDATION FOR HUMAN PERFORMANCE IMPROVEMENT (HPI)

2007 – EXPLORED HRO & CFA
  Senior Managers initiated HRO journey
  Developed a new Causal Factors Analysis (CFA) Investigation Process
  Explore “Information-Rich” events
Pantex’s HRO Journey
(safety culture initiative integrated into HRO efforts)

2008 – TESTED HRO & CFA CONCEPTS
- Published HRO and CFA Texts
- Developed HRO and CFA training
- Conducted 8 CFA investigations
- Participated in EFCOG Safety Culture Task Group

2009 – HRO IMPLEMENTATION
- Joint DOE/B&W Pantex Plant-wide commitment to improve as an HRO
- Trained managers ➔ safety culture foundation
- Introducing HROs concepts to new hires
- Continue to conduct CFA organizational investigations
- Continue to share HRO process with other DOE and DoD organizations
- Beginning EFCOG Pilot Safety Culture Assessment
Pantex HRO Implementation

- **Joint PXSO & B&W Pantex Top-Down Commitment & Framing**
  - PXSO & B&W Pantex committed to jointly strive, Plant-wide to become an HRO
  - Focus of the HRO - Pinnacle events

- **HRO & CFA Implementation**
  - Continued Education
  - Mentoring
  - HPI integration into HRO

- **HRO Feedback – Organizational Learning**
  - CFA Investigations
  - Assessing Pantex culture of reliability
  - Improving HRO performance indicators
  - Barrier analyses
Pantex HRO Implementation

- **Enhance the HRO - Process Focusing, Leaning, Streamlining**
  - Remove non-value added processes
  - Streamline remaining processes

- **HRO & CFA Communications**
  - Internal
  - External

- **HRO & CFA Applied Research and Development**
  - Benchmarking
  - Continued testing and development within Pantex
  - University collaborations
HRO Practices Improve Safety Culture

ISM Based Safety Culture Focus Areas*
(from ISM Principles with Associated Attributes)

Leadership
- Clear expectations and accountability
- Management engagement and time in field
- Risk informed, conservative decision making
- Open communication/raising issues free from retribution
- Demonstrated safety leadership
- Staff recruitment, selection, retention, & development

Employee/Worker Engagement
- Personal commitment to everyone’s safety
- Teamwork and mutual respect
- Participation in work planning and improvement
- Mindful of hazards and controls

Organizational Learning
- Performance monitoring through multiple means
- Use of operational experience
- Trust
- Questioning attitude
- Reporting errors and problems
- Effective resolution of reported problems

Work Planning & Control using ISM Core Functions
- Define Scope, ID Hazards, Implement Controls
- Perform Work
- Feedback and Continuous Improvement

HRO Practices
(with Associated Actions)

HRO Practice #1: Manage the System, Not the Parts
- Leaders ensure the safety system selected, provides safety
- Leaders manage the safety system to reduce variability
- Leaders foster a culture of reliability
- Leaders model organizational learning

HRO Practice #2: Reduce System Variability
- Deploy the Break-the-Chain framework
- Evaluate operation of the safety system
- Systematically adjust processes

HRO Practice #3: Foster a Strong Culture of Reliability
- Enable employees to make conservative decisions
- Ensure proficiency through hands-on training
- Encourage open questioning of, and challenges to, the safety system

HRO Practice #4: Learn and Adapt as an Organization
- Generate decision-making information
- Refine the HRO system: apply a system approach to reduce variability

Pantex’s Safety Culture Strategy
(based on IAEA’s Approach*)

Phase I – Safety Culture Foundation 2009
- Understand concepts of safety culture
- Understand tools to assess safety culture
- Understand methods to enhance safety culture
- Understand methods to continually improve safety culture
- Obtain practical experience

Phase II – Leverage Existing Culture Assessment Tools & Data 2009
- Culture climate survey
- Manager shop-floor walk-down survey
- Voluntary Protection Program assessments (VPP)
- CFA investigations safety culture assessment review
- Performance Indicators

Phase III – Pilot Safety Culture Assessment 2009 - 2010
- Team with Texas A&M industrial psychologists
- Pilot tools and process in one functional area

Phase IV – Baseline Safety Culture Assessment 2010
- Perform Plant safety culture assessment

* “Understanding and Assessing Safety Culture,” by Christopher Viktorsson, IAEA
Pantex’s Safety Culture Status

Phase I – Safety Culture Foundation - Training
- 100% B&W Pantex Sr. Management (2 ½ day HPI classes)
- 100% B&W Pantex Managers (8 hour HPI Fundamentals Course)
- 100% PXSO Managers and Staff (8 hour HPI Fundamentals Course)
- 100% B&W Pantex workforce (2.5 Hours HPI Introduction)
- 98% B&W Pantex HPI Investigators (80 hr HPI Fundamentals & Event Investigation)
- 2 HPI Program Coordinators (Minimum of 80 hours of HPI Training)

HRO Training - Safety Culture fully integrated – published HRO Guide
- 100% PXSO senior managers (8 hours) – Completed 04/2009
- 99% B&W Pantex senior managers (8 hours) – As of 08/2009
- 100% B&W Pantex department managers (8 hours) – Completed 08/2009
- 100% of PXSO managers and staff (8 hours) – Completed 08/2009
- 85% B&W Pantex Section Managers and First-Line Supervisors Off-Site (awareness)

Phase II – Leverage Existing Culture Assessment Tools & Data
- In progress

Phase III – Pilot Safety Culture Assessment
- In planning

Phase IV – Baseline Safety Culture Assessment
- TBD
Keys to a Successful High Reliability Organization

- Keep the most important thing, the most important thing
  - Focus on What is Important
  - Measure What is Important

- Daily Tackle the HRO vs. NAT Struggle

- Focus on the Systems Accident, Not Individual Accident
  - Individual safety will also improve

- Adopt a Systems Approach to Avoid Catastrophic Event – TPK

- Implement Systems Approach Using Four HRO Practices

- Strive to Become HRO – Improve Organizational Culture
Want to learn more?

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