

Kimbel Leffew
Gary Pool

B&W Pantex
technical services

**EMPLOYEE ENGAGEMENT
2010 DOE ISM WORKSHOP**

HPI PROCESS IMPROVEMENTS FOR 1st LINE SUPERVISION

09/15/2010

B&W Pantex
technical services



Bios

Kimbel Leffew:

- ▣ ISM Department HPI Program Manager in the Environment, Safety & Health Division for B&W Pantex in Amarillo, Texas.
- ▣ Primary lead for developing and implementing HPI tools, concepts, and practices at Pantex.
- ▣ Co-Lead in the development and implementation of High Reliability Organization practices.

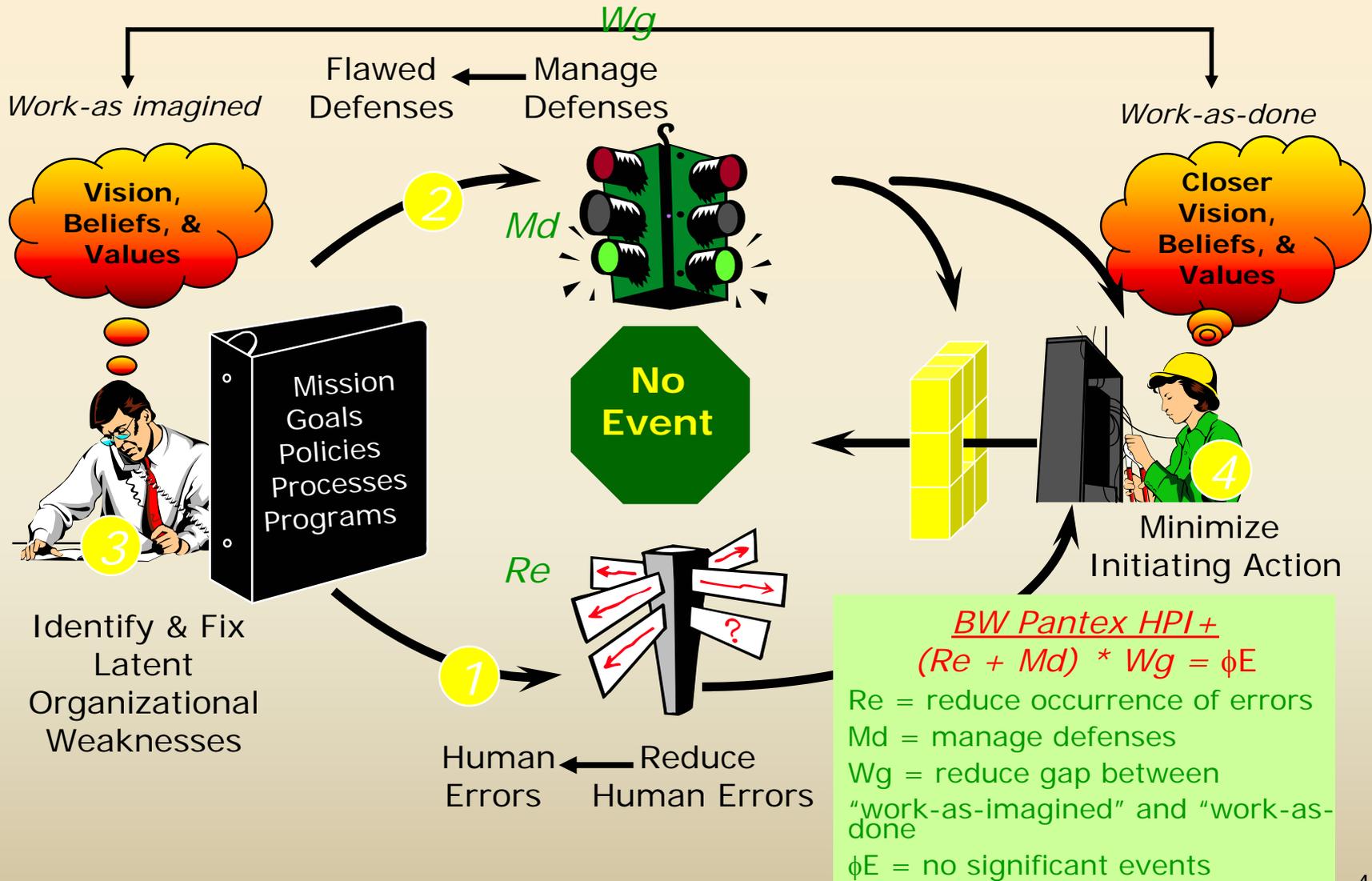
Gary Pool:

- ▣ ISM Technical Advisor for HRO in the Environmental, Safety & Health Division for B&W Pantex in Amarillo, Texas.
- ▣ 30 years of leadership experience at Pantex and other production facilities bringing innovative management solutions to solve daily challenges
- ▣ Co-lead in the HRO and HPI implementation effort

HPI Training Initiatives

- ▣ 19 Sr. Management (2 ½ day HPI classes)
- ▣ 2 HPI Program Coordinators (Minimum of 120 hours of HPI Training)
- ▣ ~ 430 - Managers (8 hour HPI Fundamentals Course)
 - Complete 100 Question Test
 - Complete HPI Homework
- ▣ 101 - HRO with HPI Training for Department Managers (8 hours) - 02/2009
- ▣ All Workforce (2.5 Hours HPI Introduction) – Completed 09/2007
 - Taught Quarterly for new employees
- ▣ 327 - HPI Training Tools for Supervisors Training (5 CBT Modules) - 09/2010
 - Perform HPI Work Area Evaluation with 2 or more employees - 12/2010
- ▣ 30 HPI Investigators
 - 40 Hour HPI Fundamentals Course
 - 40 Hour HPI Event Investigation Course
 - HPI Investigation Lead
- ▣ 327 - HRO with HPI for Section Managers (4 Hours) – 12/2009 – 09/2010

HPI + Practice of Preventing an Event



CBT – HPI Training Tools for 1st Line Supervisors/Managers

- ▣ 327 1st Line Supervisors/Managers
- ▣ CBT – 5 Modules
- ▣ Perform HPI PD in work area
- ▣ Supervisor & Minimum of 2 employees
- ▣ Requirement from Action Tracking
- ▣ Pass or Rework by ISM Department
- ▣ 327 HPI Process Improvements



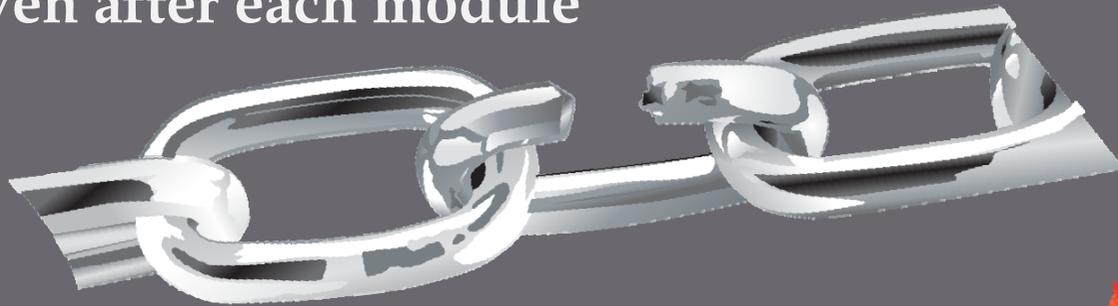
Module 1 : HRO – HPI Implementation

Training Objectives:

- ▣ Identify the HPI practices to reduce events
- ▣ Identify HRO key attributes – Break the Chain
- ▣ Define principles of HPI interview process
- ▣ Identify the basis for effective corrective actions

Practical exercises are imbedded in the CBT Program

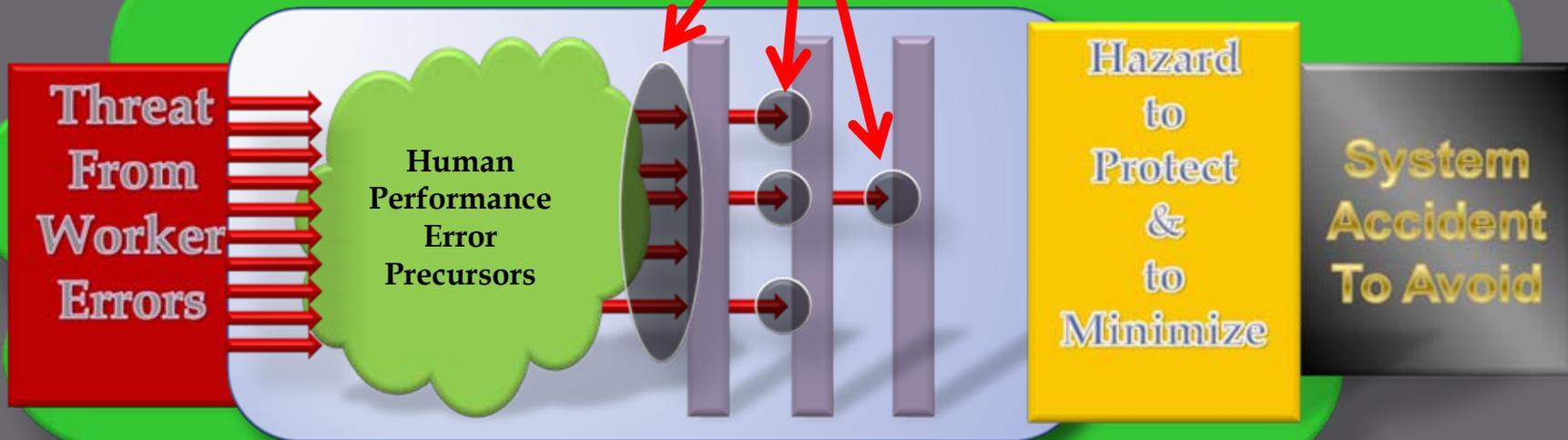
Exam given after each module



Break-the-Chain Framework

STEP 6 – LEARN FROM SMALL ERRORS TO PREVENT BIG ONES

**STEP 5
FOSTER A CULTURE OF RELIABILITY**



**STEP 3
RECOGNIZE THREAT
POSED BY HUMAN ERROR
– ERROR PRECURSORS**

**STEP 4
MANAGE
DEFENSES**

**STEP 2
RECOGNIZE &
MINIMIZE
HAZARD**

**STEP 1
FOCUS
ON THE
CONSEQUENCES**

Module 2 : HPI Supervisory Tools

Training Objectives:

- ▣ State the purpose of using the HPI Tools from INPO
- ▣ Describe:
 - the Leadership Tool
 - the Communication Strategy Tool
 - the Task Assignment Tool
 - Supervisory Observation Tool
 - Positive Reinforcement Tool
 - Coaching and Correcting Tool
 - Pre and Post-Job Review Tool



Practical exercises are imbedded in the CBT Program
Exam given after each module

Module 3 : HPI & Error Prevention

Training Objectives:

- ▣ Define the categories that compose HPI errors
- ▣ Identify at-risk practices
- ▣ Identify the conditions leading to human error (TWIN)
- ▣ Identify error prevention techniques

Practical exercises are imbedded in the CBT Program

Exam given after each module

Largest Number of Errors due to Task Demands

TWIN Analysis Matrix

Task Demands

Interpretation Requirements	
High Workload	
Unexpected Conditions Encountered	
Time Pressure	
Repetitive Actions/Monotony	
Unclear Goals, Roles, or Responsibilities	
Lack of, or Unclear Standards	

Individual Capabilities

Schedule Pressure to Get Work Done	
First Time Task	
Problem Solved Wrong	
Fatigue or Illness	
Lack of Experience with Task	
Inaccurate Mental Model of Tasks	
Misunderstood Communication	

Work Environment

Overconfidence	
Distractions/Interruptions	
Unexpected Equipment Conditions	
Unavailable Parts or Tools – Made Do	
Changes/Departures from Routine	
Personality Conflicts	
Work-Arounds	
Hidden System Response	

Human Nature

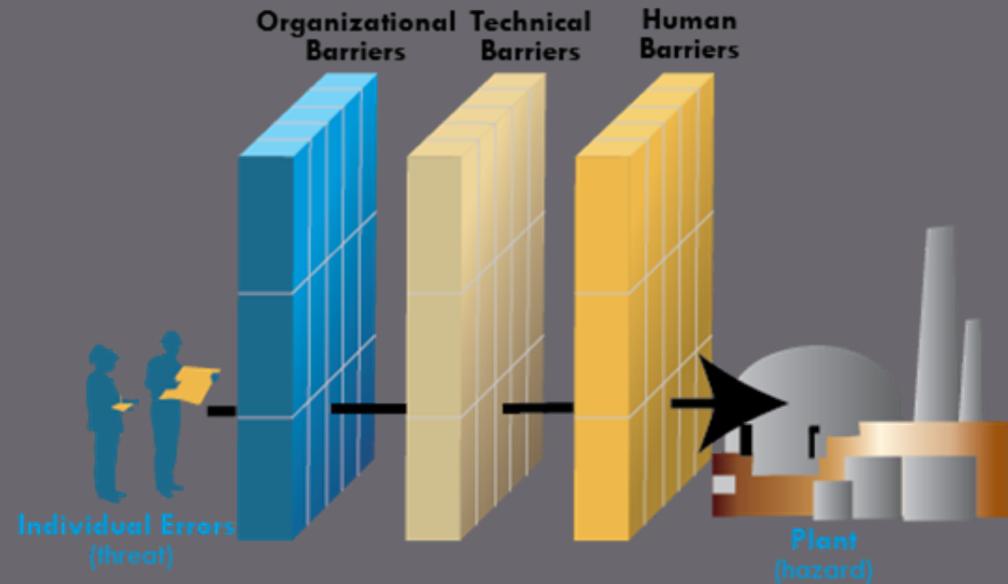
Mind Set	
Complacency	
Disoriented or Confused During Task	
Boring Task	
Work with People I Do Not Know or Like	
On the Job Stress	
Habit Patterns Cause by Wrong Actions Left Unchecked	
Inaccurate Risk or Hazard Perception	

Module 4 : HPI - Barrier Analysis

Training Objectives:

- ▣ Describe the basics of Barrier Analysis
- ▣ Identify barriers (good/bad) at your job site
- ▣ Use the barrier analysis matrix

Practical exercises are imbedded
in the CBT Program
Exam given after each module



Examples of Barriers

(Organized to the HPI Performance Model*)

<p><i>Organizational Processes and Values</i></p> <ul style="list-style-type: none">Roles, responsibilities, and expectationSupervisor feedbackTraining programsChange management processSelf-assessment and corrective action programsOperating experience programJob SchedulingStaffing levelsManagement Monitoring	<p><i>Job Site Conditions</i></p> <ul style="list-style-type: none">Procedure content and usabilityKnowledge and skills of assigned workerRoles and responsibilities for assigned taskPre-job briefingsFitness for DutyToolsWorkplace environmental conditionsIndividual readinessFitness for DutyStaffing levels
<p><i>Worker Behaviors</i></p> <ul style="list-style-type: none">Self-checkingPeer-checkingQuestioning attitudeConservative decision-makingPersonal protective equipment useProcedure use and adherenceStop work when uncertainProblem reportingQuality control hold pointsSituation Awareness	<p><i>Plant Results</i></p> <ul style="list-style-type: none">InterlocksAlarmsReactor protection systemsContainment systemsEngineered safeguards equipmentEquipment reliability

* Human Performance Fundamentals Course Reference, Dec 2002

Barrier Analysis Matrix

Column #1	Column #2	Column #3	Column #4	Column #5	Column #6
Threat to Hazard	Barrier between Threat and Hazard	Hazard Protected	Effectiveness of Barrier	Significance of Barrier in Protecting Hazard	Where does the Barrier Fall in the Work Flow Model?

Barrier Analysis Matrix

Column #1	Column #2	Column #3	Column #4	Column #5	Column #6
Threat to Hazard	Barrier between Threat and Hazard	Hazard Protected	Effectiveness of Barrier	Significance of Barrier in Protecting Hazard	Where does the Barrier Fall in the HP Work Flow Model?
HE Explosives	<i>Enter the correct machining code</i>	HE	Not effective, wrong code was entered and was not checked	Missing barrier	Organizational Processes & Value
Holding fixture not made to specifications causing risk of HE detonation	<i>Configuration control of holding fixture</i>	HE	Not effective, no configuration change control on holding fixtures	Missing barrier	Organizational Processes & Value
Ability to stop operations during abnormal event	<i>Push emergency stop</i>	HE	Not effective, no simulation training of actually pushing Emergency Stop	Penetrated barrier	Organizational Processes & Value
Distraction while HE machining is being conducted	<i>Only one person allowed in the "at the controls area"</i>	HE	Not effective, did not comply with requirement that only one person allowed in the "at the controls area"	Penetrated barrier	Worker Behaviors

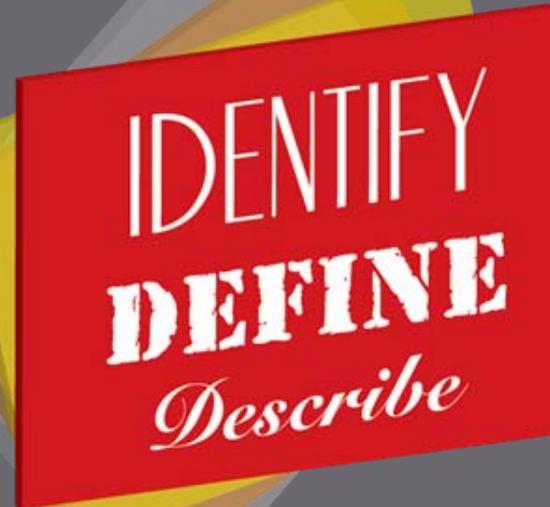
Module 5 : Application of HPI Concepts

Training Objectives:

- ▣ Identify LOWs
- ▣ Define Corrective Actions
- ▣ Identify Types of Corrective Actions
- ▣ Identify HP Error Modes and applications
- ▣ Describe the Pre-emptive HPI Analysis and CA Tool

Practical exercises are imbedded in the
CBT Program

Exam given after each module



ISM-HPI Approach

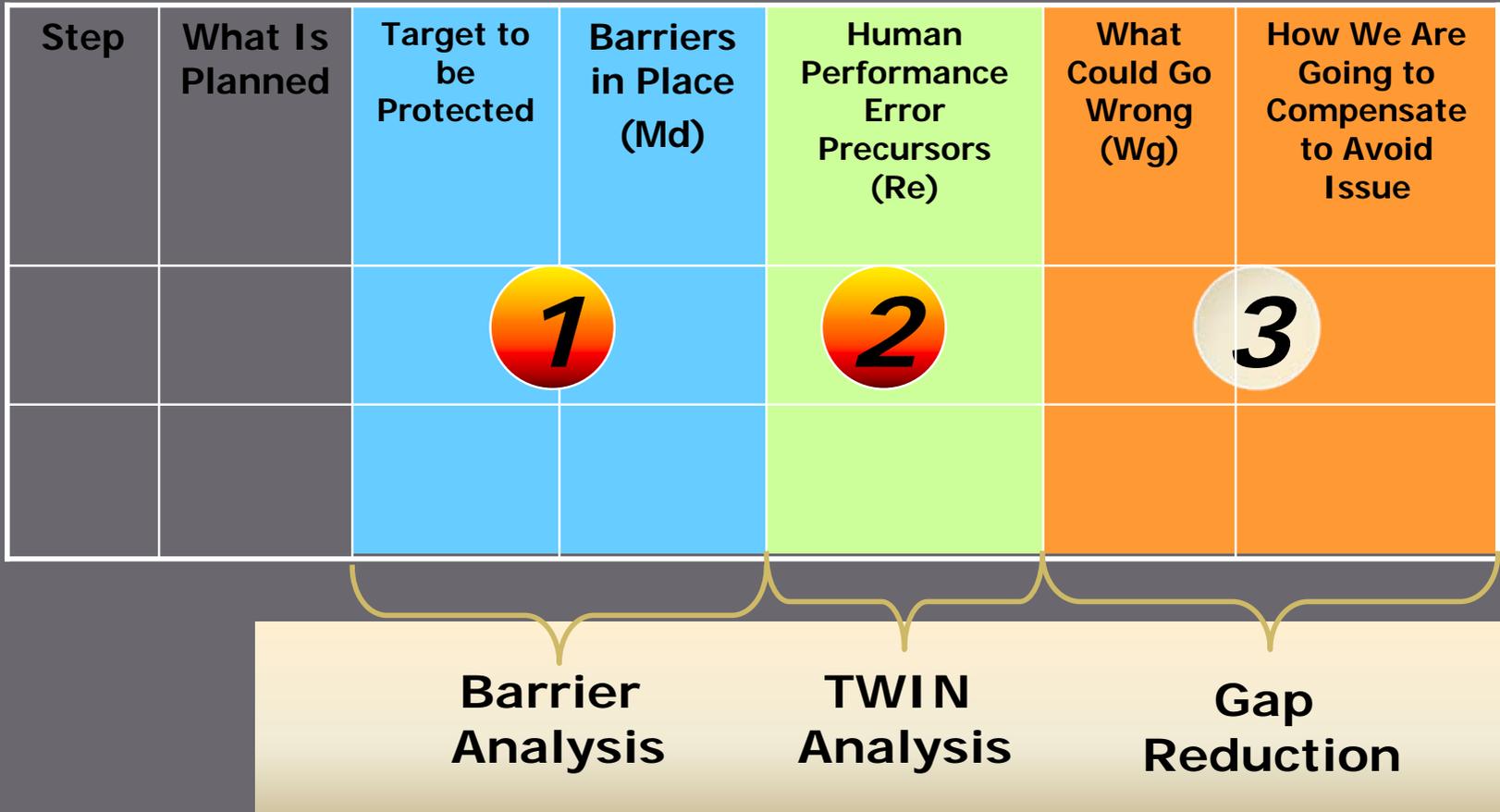
HPI WORKSHEET

Analysis through HPI Evaluation Worksheet:

- ▣ Define the scope of work:
 - Description of work process
- ▣ Analyze the Hazards:
 - Hazard Analysis of work process (TWIN)
- ▣ Develop & Implement Hazard Controls:
 - EX: Safety Bulletin addresses Safety Misconduct
- ▣ Perform work within controls:
 - Utilize Barrier Analysis Matrix
 - EX: Work was not performed within controls by procedure
- ▣ Provide feedback and improvement:
 - Analyze effectiveness of Correction Actions or process improvements
 - EX: Hazard controls put in place and not enforced

Pre-Emptive HPI Analysis & CA Tool

(Evaluate & Close Gap Between "work-as-imagined" vs. "work-as-done")



Conclusions

- ▣ Perform HPI Evaluations to prevent events
- ▣ Evaluate the corrective actions and lessons to be learned to prevent future events
- ▣ Connect HPI within HRO
- ▣ Current Process of HPI Implementation:
 - Performing Management Self Assessments to determines gaps in work processes.
 - Performing Barrier Analysis to help close the Gap between Management (work as imagined) and employees (work as done)

