

# Applying Human Performance Improvement Principles to the Hanford Emergency Response Organization

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### Human Performance Improvement (HPI)

- Program developed by Institute of Nuclear Power Operations (INPO)
- DOE site offices and prime contractors embracing HPI principles
- Looks at processes/procedures, work environment and behaviors that impact the way we perform work
- Recognizes and accepts that we will make mistakes
- Provides tools to identify and eliminate errorlikely situations



### Principles of HPI

- □ People are fallible even the best make mistakes
- Error-likely situations are predictable, manageable, and preventable
- Individual behavior is influenced by organization processes and values
- □ High level of performance is often based on encouragement and reinforcement from leaders, peers, and subordinates
- Events can be avoided by understanding why mistakes occur, and applying lessons learned from past events



# The Four Key Questions At The Pre-Job Briefing

- 1. What are the critical steps or phases of this task?
  - (Important parts of the task that must go right)
- 2. How can we make a mistake at that point?
  - (Use error precursors card)
- 3. What is the worst thing that can go wrong?
  - (A review of potential consequences and contingencies)
- 4. What barriers or defenses are needed?
  - (Peer check, 3-way communication, place keeping, flagging)



### Training Approach

- Introduce Emergency Management Program (EMP) staff to HPI
  - Family Feud game to develop new attitudes and behaviors and promote peerto-peer interaction
- Provide HPI principles to Emergency Response Organization staff
  - Identify critical tasks
  - Error precursors
  - Barriers needed



### Family Feud

- Emergency Management Program leadership team identified critical tasks
  - Responding to emergencies
  - Conducting drills and exercises
  - Annual review of EPHAs
- Leadership team and staff then identified top five error precursors for each critical task
  - Issues that affect human performance



### Common Error Precursors

Task Demands	Individual Capabilities
- Time pressure (in a hurry)	- Unfamiliarity with task (first time)
- High workload (memory requirements)	- Lack of knowledge (mental model)
- Simultaneous, multiple tasks	- New technique not used before
- Repetitive actions, monotonous	- Imprecise communication habits
- Irrecoverable acts	- Lack of proficiency/inexperience
- Interpretation requirement	- Indistinct problem-solving skills
- Unclear goals, roles, and responsibilities	- "Hazardous" attitude for critical task
- Lack of, or unclear standards	- Illness/fatigue
Work Environment	Human Nature
Work Environment - Distractions/interruptions	Human Nature - Stress (limits attention)
- Distractions/interruptions	- Stress (limits attention)
- Distractions/interruptions - Changes/departures from routine	- Stress (limits attention) - Habit patterns
<ul><li>Distractions/interruptions</li><li>Changes/departures from routine</li><li>Confusing displays or controls</li></ul>	- Stress (limits attention) - Habit patterns - Assumptions (inaccurate mental picture)
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### Family Feud

- Survey results were summarized and top five error precursors for each critical task identified
- EMP staff were separated into teams
- □ Teams took turns identifying error precursors associated with critical tasks
  - Points were awarded for correct answers
  - Prizes and bragging rights for winning team



### Family Feud

- Conclusion
  - Provided awareness training on EMP's critical tasks
  - Management and staff aware of error precursors affecting critical tasks
  - Provided management a tool to anticipate, reduce, or prevent errors based on employee feedback



## Emergency Response Organization Training

- Provided to over 300 personnel assigned to the Emergency Operations Center (EOC) during annual refresher training
- Introduce EOC staff to human performance improvement principles



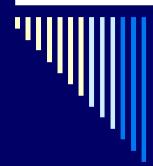
### Exercise #1

- □ Review position-specific procedure
- □ Identify top three critical tasks



# Critical Tasks RL/ORP Emergency Manager

- Keep Policy Team members informed of event status
- Approve changes to event classification and offsite protective action recommendations
- Approve emergency termination



#### Errors

- People do not make mistakes intentionally
- Errors are a behavior done without malice or forethought
- We all make about five to ten mistakes every hour
- Conditions embedded in the job site that create mismatches between a task and the individual are called error precursors



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#### Exercise #2

- How can we make a mistake?
  - Determine error precursors
- Most common:
  - Time pressure (in a hurry)
  - Distractions/interruptions
  - Simultaneous/multiple tasks
  - Assumptions (inaccurate metal picture)
  - Stress
  - Imprecise communication habits
  - Unfamiliarity with task



#### Exercise #3

- What barriers or defenses are needed?
  - Unified Dose Assessment Center holds quarterly sessions to review software used in consequence assessment
  - Procedures being streamlined to remove unnecessary wording and tasks
  - EOC Open Door Policy



### Process Improvements

- Provided additional risk communication training
- Developing quarterly tabletop sessions or information bulletins to provide more information and practice opportunities for our staff
- Identifying critical tasks within each position procedure

