

Coker Egress and Personnel Safety Auditing

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What's going on?

Numerous serious coking incidents in the past few years....

• Continuous improvements in Refinery Safety Systems

- PHA becoming more sophisticated to identify and prevent loss of containment.
- Safety interlocks to prevent maloperation becoming more complex and more routinely used for coker switchdecks.
- Emergency Response at sites are continuously improving.

What's going on?

Numerous serious coking accidents in the past few years....

- Seemingly regardless of these improvements, major incidents with property loss, injury, and even loss of life still occur.
- So how are these incidents still happening to us?

Possible reasons major incidents still occur:

- Cokers are different from other refining units:
 - They are not steady state operating units, but instead experience partial unit shut down and start ups every day. Risks can be very different from steady state operating units when evaluated with conventional methods.
 - Possible over-reliance on interlocks.
 - There may be some gaps in the armor specific to cokers. Possible personnel safety gaps between the time PHA systems breakdown (loss of containment) until ER can respond may not always be recognized.

Analyzing coker incidents occurring in the past 10 years

• Common threads

- Companies suffering major incidents often have:
 - Excellent PHA Systems
 - Excellent Emergency Response
- Whatever the root cause, incidents often manifest themselves at the top head, bottom head, and drain.

Identifying Safety System Gaps in Cokers

- Focusing on the possibility of incidents at each historical source: top head, bottom head, drain, etc...
- Disciplined, systematic evaluation of hazards from each source for each operational and maintenance location.
- Audit with the right folks: Operators, Unit Engineers, Site Loss Prevention Personnel.

Identifying Hazards

- From each of the sources at each of the work locations.
- Hazards at different work locations to each of the sources may be a different list.
- Could be fire, smoke inhalation, thermal burn from hot water and coke, etc...

Evaluating Personnel Safety and Egress at each work location

- Identify what's in place to protect the worker at each location, and how it could be improved.
- Identify what's in place to provide routes of *Natural Egress* from each location, and how could it be improved.
- Identify if the work can be relocated to a safer place.

Personnel Safety and Egress Audit Worksheet	
XXXXXXXXXX Coker Unit	
5-Jan-01	
Operation / Maintenance Task	
Location	
Hazard	
Existing Hazard Mitigation. List what's currently in place to protect the worker from the hazard while completing this task.	
Possible improvements to protect worker from hazard during task.	
Existing Egress Mitigation. List what's currently in place to facilitate worker in safe egress in the event of hazard.	
Possible improvements to facilitate emergency egress in the event of hazard.	
Can task be moved to safer location? If practical to relocate job to safer location, list possible improvements to facilitate.	

Typical Identified Items Include:

- Results are site and layout specific.
- Some Big Rocks
 - Items such as automated unheading, deluge systems, water curtains between unheading and switch deck.....
- Some smaller, low capital improvements that really improve safety and egress.
 - Egress Routes and catwalks, Removal of obstructions, Procedures, Relocation of controls...

Now What?

- Will identify big and small things to do
- These can be estimated, prioritized.
- Handle by Major Project
- or Pick them off as you can. Many can maybe be done by Area Mechanical Folks.
- We think the important thing is to find them, list them, get started.