

Working Safely in Hazardous Environments

The Recent EM Experience: Lessons in Safety Management and Oversight

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Safety Challenges Inherent in the EM Cleanup Milieu

- Diverse sites and missions
- Different contractors
- Varying corporate safety cultures
- Subcontractors
- “First-of-a-kind” work
- Many different types of hazards
- Unknown physical conditions and hazards



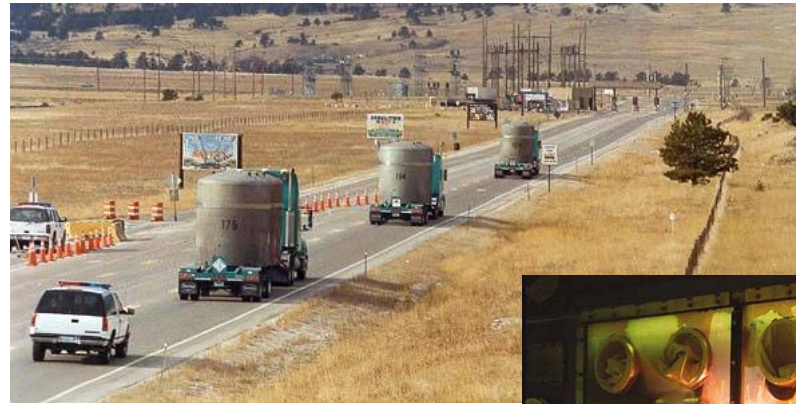
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EM is involved in dangerous types of work

- Construction
- Demolition
- Mining
- Waste transfer
- Radiological activities
- Plasma arc cutting



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With many inherent hazards

- Contamination
- Chemicals
- Working at height
- Confined Space
- Electrical
- Explosives
- Supplied air
- Fire
- Sharp objects
- Heavy machinery



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A Unique Safety Management Challenge

Catastrophic Events

Building Fires

Major Radiation Contamination

Explosions

Cave-ins



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Occasionally, some unusual stuff

- Cutting a plenum ceiling ... and the fire suppression line above the plenum
- Flying 4' x8' plywood due to high winds
- Gas samples recirculated in facility
- Springy steam line
- Glovebox fire



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Mostly routine events which fortunately have not, for the most part, caused major injuries or fatalities

- But, which could have....
- Occurrences such as:

Falling from Extension Ladders

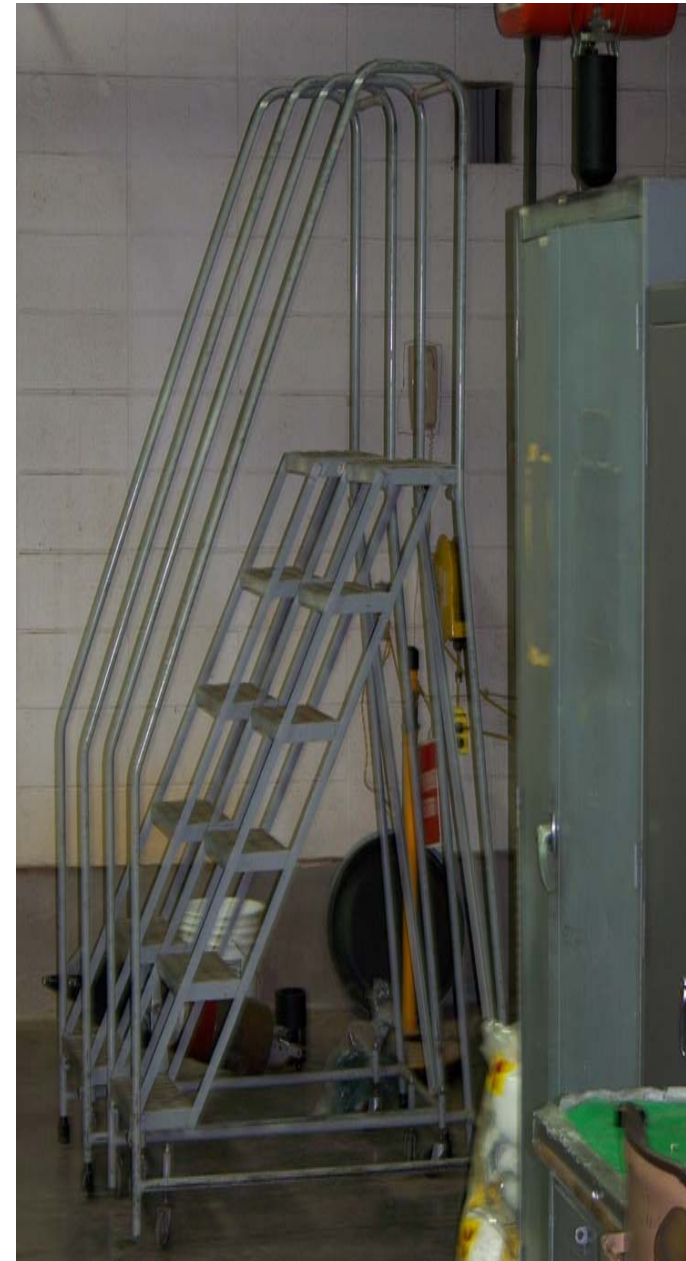


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Falling from Rolling Ladders



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Falling through roofs

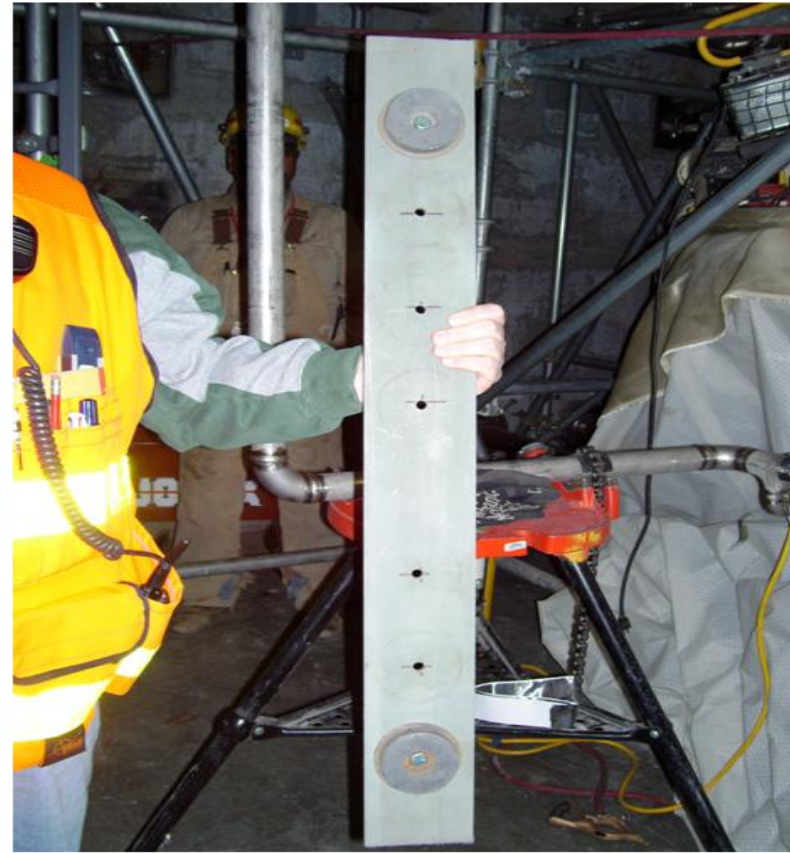


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Falling Objects



Example of metal piece with intact magnets



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Objects Falling from Roofs



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Energized Objects



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Rebounding Rebar



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Unsecured Loads



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Vehicle Mishaps



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EM Event Pedestrian Struck by Forklift



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Commercial Event Pedestrian Crushed and Killed by Forklift



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Commercial Event Spotter Crushed and Killed by Forklift



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EM Event

Forklift at Night Moving Too Fast



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Commercial Event Forklift at Night Moving Too Fast



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EM Event

Forklift Strikes Overhead Door



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Commercial Event

Forklift strikes overhead door



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Lessons in Safety Management

- Unique work environments present unique hazards
- Interactive environments present unique challenges
- ISM can handle complex hazards
 - Safety culture
 - Work planning
 - Worker involvement
 - Ensure formality in conduct of operations
 - Learn lessons
- Frequent safety reminders
- Rethink thinking that there's no hazard
- Expect the unexpected



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What have we learned about safety oversight?

- Senior management involvement
- Lines of authority must be clear and unambiguous
- Ensure buy-in by first-line supervisors
- Make sure the little things are fixed so the big things don't happen
- Follow-up on corrective actions to ensure completeness and effectiveness
- Challenge the status quo to alter behavior
- Be relentless



Learning Never Stops

- **Success does not consist in never making mistakes, but in never making the same one a second time.**
 - George Bernard Shaw
- **Learning is not compulsory . . . neither is survival.**
 - W. Edwards Deming
- **Keep the check in checklist**
 - Bob Goldsmith