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Session # 136
Incorporating Emergency Procedures and Responses

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Ohio | Bureau of Workers' Compensation

Incorporating Emergency Procedures and Responses

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What is an Emergency?

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Fire

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Explosion

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Oil Spill

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What Do All of These Have in Common?

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Things in Common

- Each activity that preceded the incident started with a plan.
- Each of the plans included procedures for successfully completing the plan.
- Each of the procedures included individual tasks.

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Things in Common

- Nowhere in any of the plans could you find:
  - "After adding the last drum to the reactor, set fire to the plant."
  - "Once you have finished the mix, blow the whole thing up."
  - "After turning 30 degrees to port, spill all of the oil out of the ship."

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What is an Emergency?

- Safe to say that each of these incidents started with a plan and ended in a disaster.
- At some point in the project, there was a failure in the plan.
- For the purpose of this presentation we will call an emergency:

A Failure in the Plan

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When Does an Emergency Begin?

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In the Beginning

- Many people believe that the emergency started with the fire, explosion or oil spill.
- The emergency started when there was a deviation from the acceptable during the process.

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Case Study #1

Apollo 13

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Planning Process

- Ultimate Goal Point B
- Starting Point Point A
- Tasks to get from A to B.
- Procedures to accomplish each task.

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Planning Process

- Prior to proceeding to the next task you must ensure that the previous task was successfully completed.
- Defining successful completion of a task is critical to product quality.

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Planning Process

- Planning issues critical to preventing incidents:
  - Defining acceptable conditions prior to starting the next task.
  - Detailing the potential causes of the unwanted condition.
  - Identifying the potential consequences.
  - Detailing what to do when conditions aren't acceptable.

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Example

- Add the first chemical to the mixer.
- Open the steam line to heat the mixer.
- When the temperature reaches 150ºF, add the second chemical to the mixer.

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Example

- Very simple plan – 3 Steps
- Successful completion of Step 2 is defined and measurable.
- Step 3 is a sure thing …….. Unless!
- It was supposed to take approximately 3 hours to heat the material and it only took 1.5 hours

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Example

- Does it matter?
- What factors could have caused the accelerated heating process?
- Could the factors that caused the accelerated heating create a hazard which could lead to an emergency?

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Potential Causes

- What factors could have caused the accelerated heating process?
  - A leak in the heating coil resulting in steam added directly into the material.
  - A contaminant in the material that is causing an unwanted reaction.
  - Wrong material added originally.
  - Wrong amount of material added originally.

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Potential Consequences

- Adding wrong amount.
  - Stop at that point — Lose time
  - Continue — Poor quality product/Waste
- Adding the wrong material.
  - Stop at that point — Lose time
  - Continue — Could get and unwanted reaction

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Potential Consequences

- Leak in the heating coil
  - Stop at that point — Lose time, Waste material
  - Continue — Overfill reactor, Waste material
- Contaminant in the material
  - Stop at that point — Material continues to heat;possible release or explosion
  - Continue — Material continues to heat;possible release or explosion

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Response

- Insert a comment into the procedure:

  "The heating process should take approximately 3 hours. If material reaches 150ºF in less than 2.5 hours remove the heat from the mixer."

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Response

- Troubleshoot most hazardous to least hazardous.
- Identify troubleshooting procedures.
- Detail action to take when cause is identified.
- Specify safe limits of activity.

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Case Study #2

West Side Evacuation

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Acceptable Conditions

- Temperature
- Pressure
- Volume
- Time
- Rate
- Order of Addition

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Hazard Assessment

- Deviations
- Causes
- Consequences
- Corrective Actions

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Checklist Procedures

- Develop procedure as a checklist.
- Require that data be inputted.
- Require that conditions be verified prior to proceeding.
- Establish quality max and mins as well as safety max and mins.
- Include troubleshooting and corrective actions in the affected step.
- Establish a “Hard Ceiling”

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Case Study #3

Potassium Hydroxide

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Questions

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