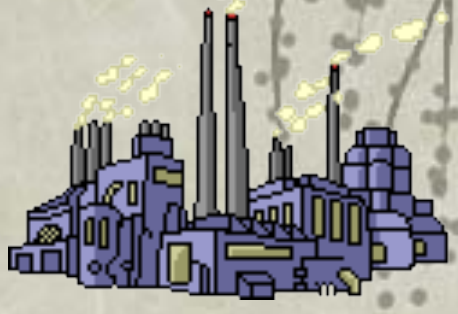
Engineering Safety and Risk Management

Faculty Seminar

CCOHS Job Safety Analysis
& Application in the Lab

Presented by:
John R. Cocchio, P.Eng.
Winter 2013



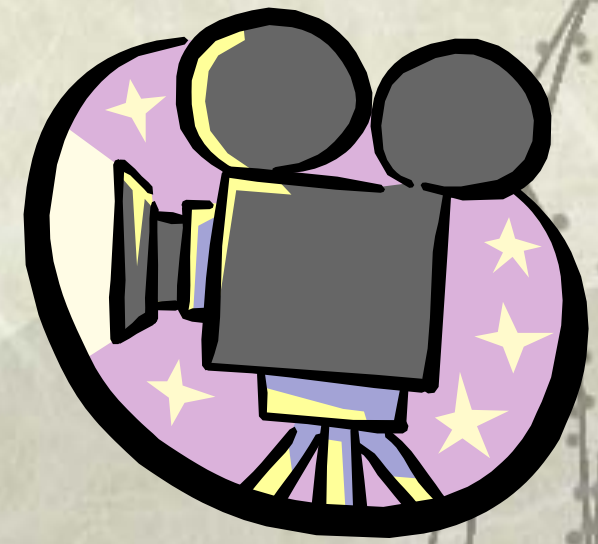
UCLA Lab Explosion

http://www.csb.gov/investigations/detail.aspx?SID=90&Type=2&pg=1&F_InvestigationId=90

On-line Video from the US Chemical Safety Board

Key Point: Start: 03:30 End: 05:00

Recommend that you review the full 24:05 video at your convenience.



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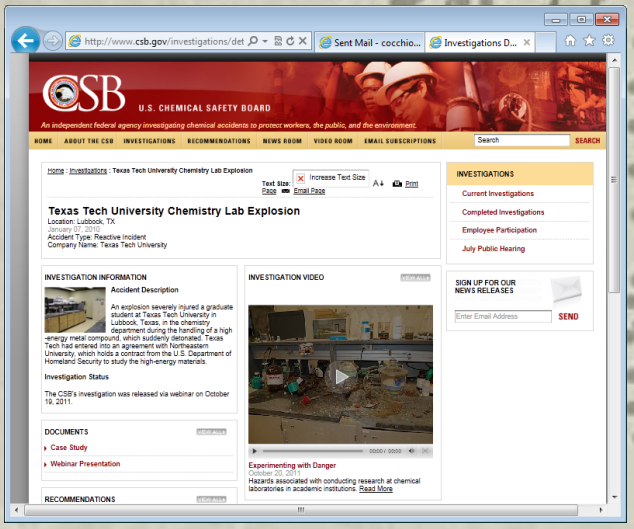


Learning Objectives of This Lecture

1. To explore how to plan and document a job such as an analytical method or lab procedure using the CCOHS (Canadian Centre for Occupational Health & Safety) Model for Job Safety Analysis.

Job Safety Analysis

- A methodology for planning, analysing, assessing, and executing any task, job, procedure, or project i.e. the method can be broadly applied.
- The outcome of a JSA is a documented methodology, method, process, or procedure.

- Many questions come to mind: Why do a JSA? What is a JSA? Is it the same as an SOP? Benefits?
- What we'll discuss here are the basic steps to conducting a JSA.
- The benefits are:
  - An efficient job plan / procedure
  - Job can be executed with risk of injury minimized.
  - A documented job plan suitable for training, and for managing changes in equipment, personnel, and the procedure itself.
  - And others!

Basic Steps to Conduct a JSA

1) Select the job / job scope / nature of work / project.
2) Identify job steps.
3) Identify the hazards.
4) Assess the risks.
5) Identify control measures / safeguards.
6) Re-assess risk.
7) Review and discuss the JSA with those executing the work.
8) Execute the work.

Points to Consider about a JSA

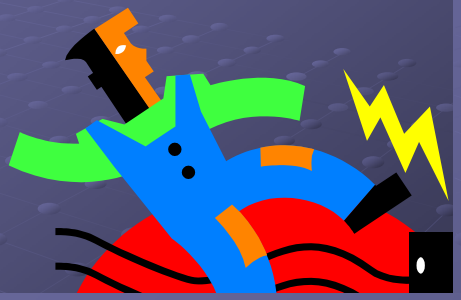
Some points to consider:

- Analysis and assessment can be “co-mingled”, as can be re-assessment of risks.
- Can be applied to a task or minor job, to a complex job or even a project involving quite a number of jobs.
- Preferable that all stakeholders participate in the creation and review and approval of a JSA.
- It is a very sharply focused application of the very broad Risk Management Process.

How to Find a Hazard - The Injury Triangle

…….or we can find a hazard by using 3 component definition

- Energy
- Triggers
- Body



We Introduced …

- Energy, and
- Lack of Safeguard (or failed safeguard), and
- "In the Lin[illegible] Fire".

Three Component Definition

When identifying hazards look for or think about the following:

- Finding the energy sources - mechanical, electrical, chemical, thermal etc.
- Finding the circumstances or mechanisms that will cause or trigger unwanted and uncontrolled releases.
- Looking for bodies, objects and environment that could be harmed by an uncontrolled energy release

Let's Change a Tire!

Job Safety Analysis Worksheet		
Job Scope / Scope of Work / Nature of Work:		
Analysis By:	Reviewed By:	Approved By:
Date:	Date:	Date:

Potential General Hazards	**Control Measures & Personal Critical Behaviours**

Major Tasks of Job or Sequence of Steps	**Potential Hazards**	**Control Measures & Personal Critical Behaviours**

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Job Safety Analysis Worksheet		
Job Scope / Scope of Work / Nature of Work: **Remove Wheel Assembly with Flat Tire from Vehicle, Replace Spare Wheel Assembly.**		
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a) Pinch Points, Abrasions, Sharp Edges b) Strains c) Being Struck By d) Exposure to traffic			
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Let's Change a Tire!

Major Tasks of Job or Sequence of Steps	Potential Hazards	Control Measures & Personal Critical Behaviours
Park vehicle		
Remove spare and tool kit		
Pry off hub cap and loosen lug nuts (or bolts on some vehicles) by ½ to 1 turn.		
Place jack on firm ground and at specified position on vehicle for jacking.		
Begin jacking vehicle until tire is clear of ground, allowing for flattened tire as well.		
Loosen lug nuts / bolts.		
… and so on …		

Let's Change a Tire!

Major Tasks of Job or Sequence of Steps	Potential Hazards	Control Measures & Personal Critical Behaviours
Park vehicle	a) Vehicle too close to passing traffic. b) Vehicle on uneven, soft ground. c) Vehicle may roll.	a) Drive to area well clear of traffic. Turn on emergency flashers. b) Choose a firm, level parking area c) Apply the parking brake; leave transmission in PARK; place blocks in front and back of the wheel diagonally opposite to the flat d) Use flares or reflective warning triangles if in unavoidable traffic area.

Let's Change a Tire!

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Pry off hub cap and loosen lug nuts (or bolts on some vehicles) by ½ to 1 turn.	a) Hub cap may pop off and hit you b) Lug wrench may slip	
Place jack on firm ground and at specified position on vehicle for jacking.	a) Jack may sink or vehicle is unstable on soft ground. b) Jack may damage underside of vehicle.	
Begin jacking vehicle until tire is clear of ground, allowing for flattened tire as well.	a) Vehicle is unstable and may shift off jack. b) Jack may "kick-back".	
Loosen lug nuts / bolts.	a) Wheel assembly may fall from hub. b) Falling wheel may destabilize vehicle.	
… and so on …		

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Remove spare and tool kit	a) Pinch points between spare and vehicle. b) Strain from lifting spare.	a) Wear hand protection (work gloves). b) Turn spare wheel assembly into upright position in the wheel well. Using your legs and standing as close as possible, lift spare out of truck and roll to flat tire.
Pry off hub cap and loosen lug nuts (or bolts on some vehicles) by ½ to 1 turn.	a) Hub cap may pop off and hit you b) Lug wrench may slip	a) Pry off hub cap using tool with steady pressure. b) Use proper lug wrench; apply steady pressure slowly. Push down; do not pull up as this may strain your back.
Place jack on firm ground and at specified position on vehicle for jacking.	a) Jack may sink or vehicle is unstable on soft ground. b) Jack may damage underside of vehicle.	a) Use a wooden board or metal plate under jack. b) Check owner's manual for exact position.
Begin jacking vehicle until tire is clear of ground, allowing for flattened tire as well.	a) Vehicle is unstable and may shift off jack. b) Jack may "kick-back".	a) Keep body and limbs clear of underside of vehicle, and clear of jack.
Loosen lug nuts / bolts.	a) Wheel assembly may fall from hub. b) Falling wheel may destabilize vehicle.	a) Steady wheel assembly. b) Keep body and limbs clear of underside of vehicle, and clear of jack
… and so on …		

Let's Change a Tire!

You are now well on your way to changing a flat tire on your vehicle with …

hazards addressed, and risk of personal injury minimized.

Job Safety Analysis Worksheet		
Job Scope / Scope of Work / Nature of Work: **Remove Wheel Assembly with Flat Tire from Vehicle, Replace Spare Wheel Assembly.**		
Analysis By: JRC	Reviewed By: GW	Approved By: SK, PhD
Date: 20130407	Date: 20130408	Date: 20130409

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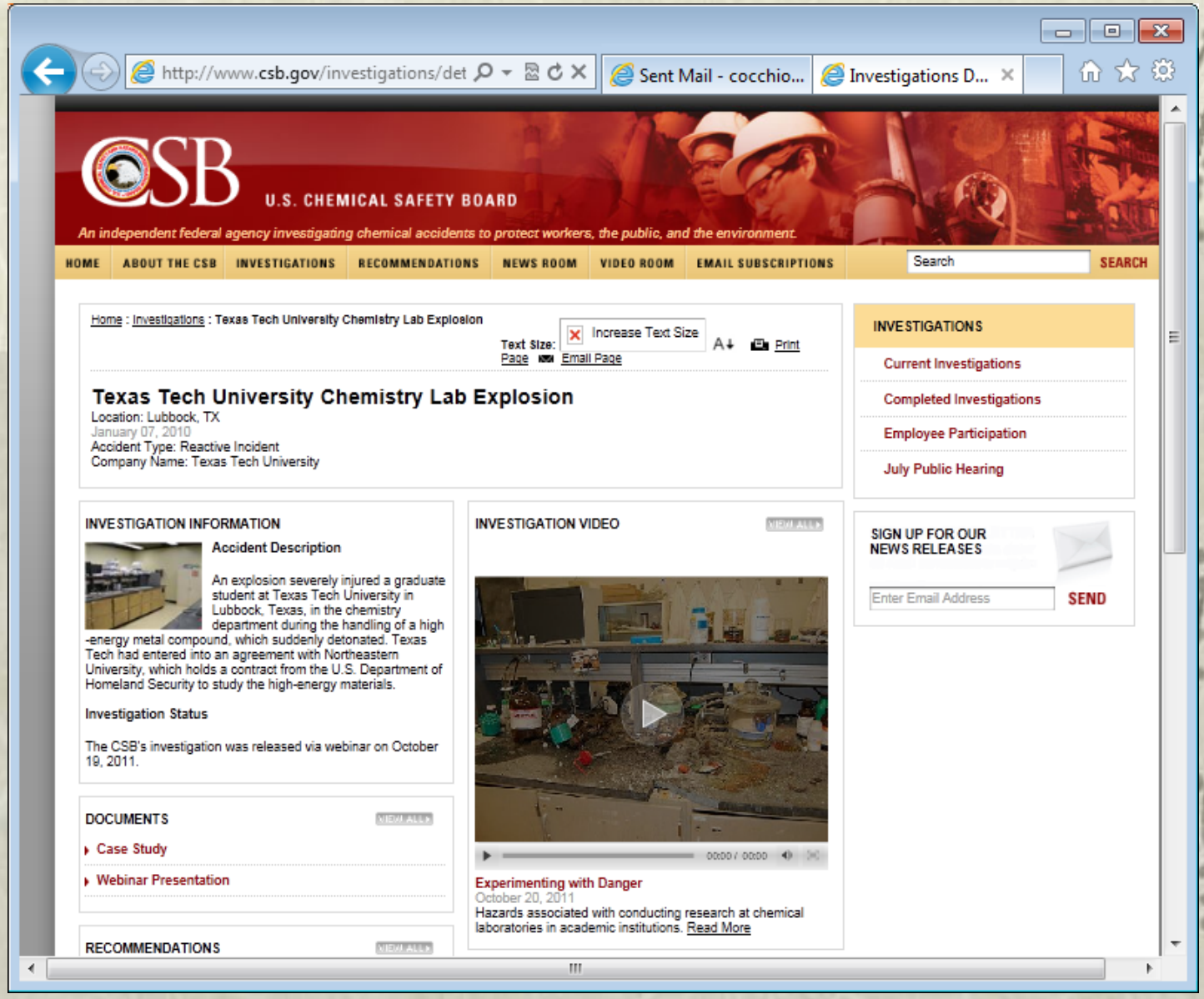
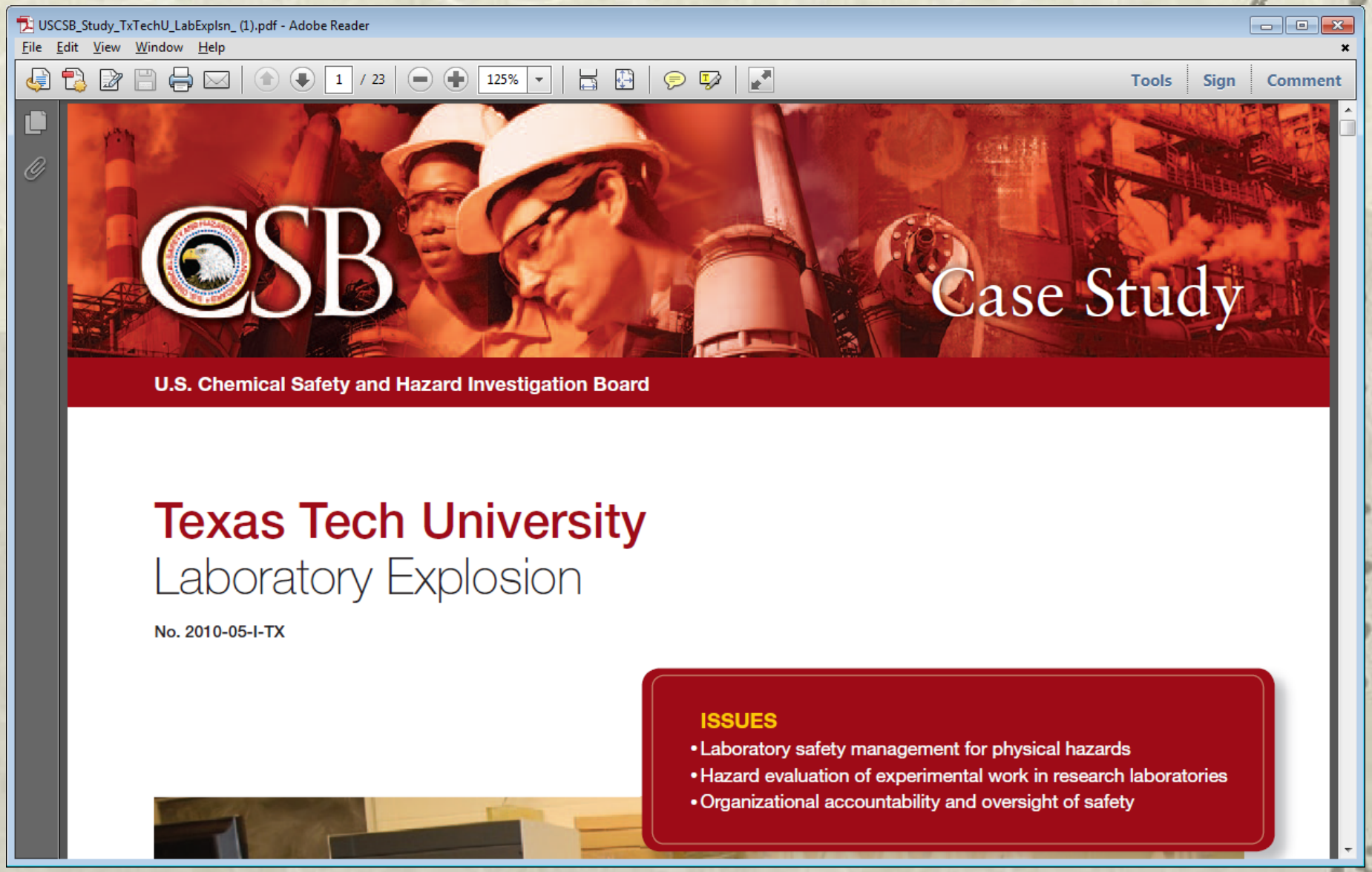


http://www.csb.gov/assets/document/CSB_Study_TTU_.pdf



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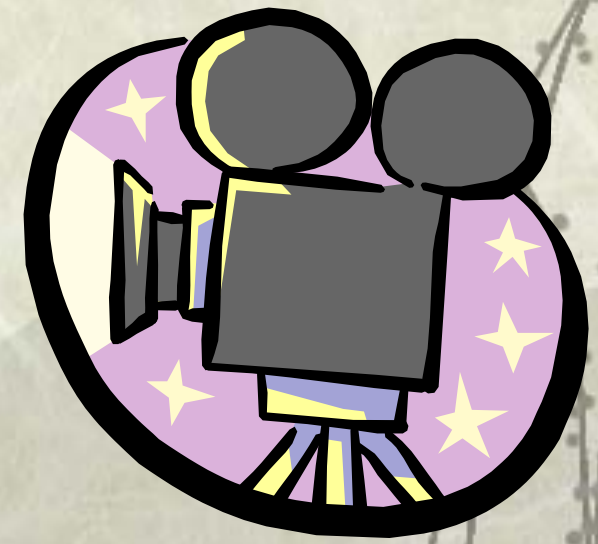
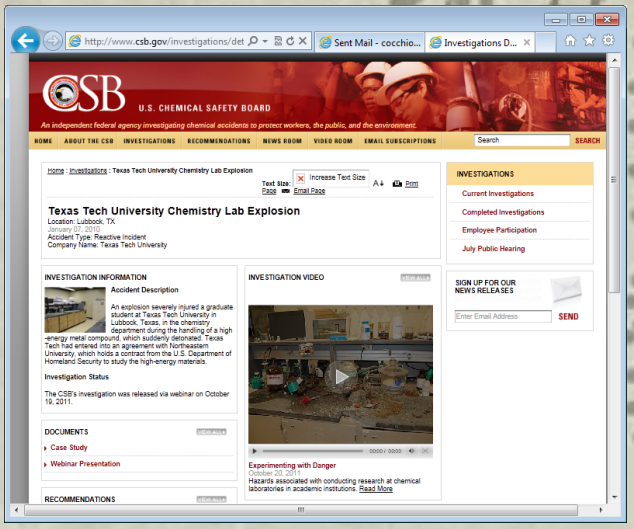


Video



Let's Build a Lab Procedure Using the JSA Model