

Element 1.2: Process safety leadership



Activity

Buncefield is discussed throughout this element so it would be useful for you to have an awareness of the incident. The report into the HSE's prosecution of companies involved in the Buncefield explosion, together with photographs and video evidence can be viewed on the HSE website (www.hse.gov.uk). Review some of the evidence and familiarise yourself with the case.



Activity

Piper Alpha will be discussed several times in the course, so it would be useful to have an understanding of the disaster. Use the HSE website, search engines and public access video sites to understand (briefly) what happened and why the incident had such a profound impact on the industry and process safety as a whole.



Activity

Consider the organisation or environment that you work in - how confident are you that leaders and managers are fully aware of the hazard potentials of the organisation's processes?

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Activity

Consider how confident you are that you understand your process safety responsibilities. What about your colleagues and senior managers?



Activity

Identify three process safety indicators that are used in your workplace to monitor process safety. Write these down in advance of starting Element 2.



Activity

Think of a recent process safety incident that has occurred in your workplace that did not result in injury (for example, a spill or loss of containment). How was the investigation managed? Was it investigated briefly as a 'near miss' or was it viewed as having the potential for a more serious event and investigated more thoroughly?

Element 1.3: Organisational learning



Activity

For the incident you have considered in the last Activity, what were the immediate and root causes that were identified?



Activity

Visit the Chemical Safety and Hazard Investigation Board's (CSB) website at www.csb.gov and look at the information that is available to assist in process safety, including the videos that can be used for training. Read the news release into the findings of the Watson Grinding facility propylene explosion in Houston, Texas in 2020 as an example.



Activity

Look at the sources of information available in your organisation to assist in process safety management. Are they documented, reliable, current and easily available to the people who need to use them?

Element 1.4: Management of change



Activity

Think about your MOC process - either, one you are currently working with, or from a previous role. How effective is it? Is it valued by all involved? Is it rigorously used at all times? Could you make any improvements?

Element 1.5: Worker engagement



Activity

Write down all of the ways in which your organisation consults with workers. Which are truly consultative and which are informative? Can this be altered to increase consultation?

Element 1.6: Competence



Activity

Training is an essential part of building competency. Consider when and how you carry out safety training. Do you hold refresher training in safety topics? Are new workers more up to date with standards and requirements (after their safety induction) than longer-term workers?



Activity

Think about how you check competency after training. Attending a training session is one part of the jigsaw, but how does your organisation ensure that after training workers are truly competent?

Element 2.1: Establishing a process safety management system



Activity

Review the systems you have in place for process safety management - how many elements from the PSMS table do you have in place?



Activity

Think about your health and safety policy. Does everyone know what it says and what the organisation aims are with regard to health and safety - especially process safety?

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Activity

In Element 1, you were asked to write down three process safety indicators. Now review these and determine if they are leading or lagging indicators. What additional measures could be implemented to manage process safety in a more proactive manner?

Element 2.2: Risk management techniques used within the process industries



Activity

Think about what the biggest risks faced by your organisation are. How well are these risks being controlled? Can you think of any obvious risk-reduction measures that are needed? If so, how can you bring this to management's attention?



Activity

For one simple element of your process, draw a basic event tree. For example, filling a tank and the subsequent high level alarms, fire detection or gas detection.

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Element 2.3: Asset management and maintenance strategies



Activity

Write down where on your site there is the potential for a flammable atmosphere. Are the areas clearly marked? Do you control the use of electrical equipment in that area to prevent ignition?



Activity

Identify five planned preventive maintenance activities that could be carried out on a site.

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Element 2.4: Role, purpose and features of a permit-to-work system



Activity

Take a look at a permit-to-work in your workplace (or you can search for an example online) and see how each of the sections discussed have been included in the permit.

Element 2.6: Contractor management



Activity

Identify different types of contractor or contract organisation who could be on site.

Element 3.1: Operating procedures



Activity

When procedures are not fully understood, disasters can happen. The CSB website hosts videos depicting various disastrous incidents, including the West Fertiliser Company incident in Texas. Watch the videos at www.nebosh.org.uk/psm-activity-sheet-videos/



Element 3.4: Utilities



Activity

Watch a video on superheated steam at www.nebosh.org.uk/psm-activity-sheet-videos/





Activity

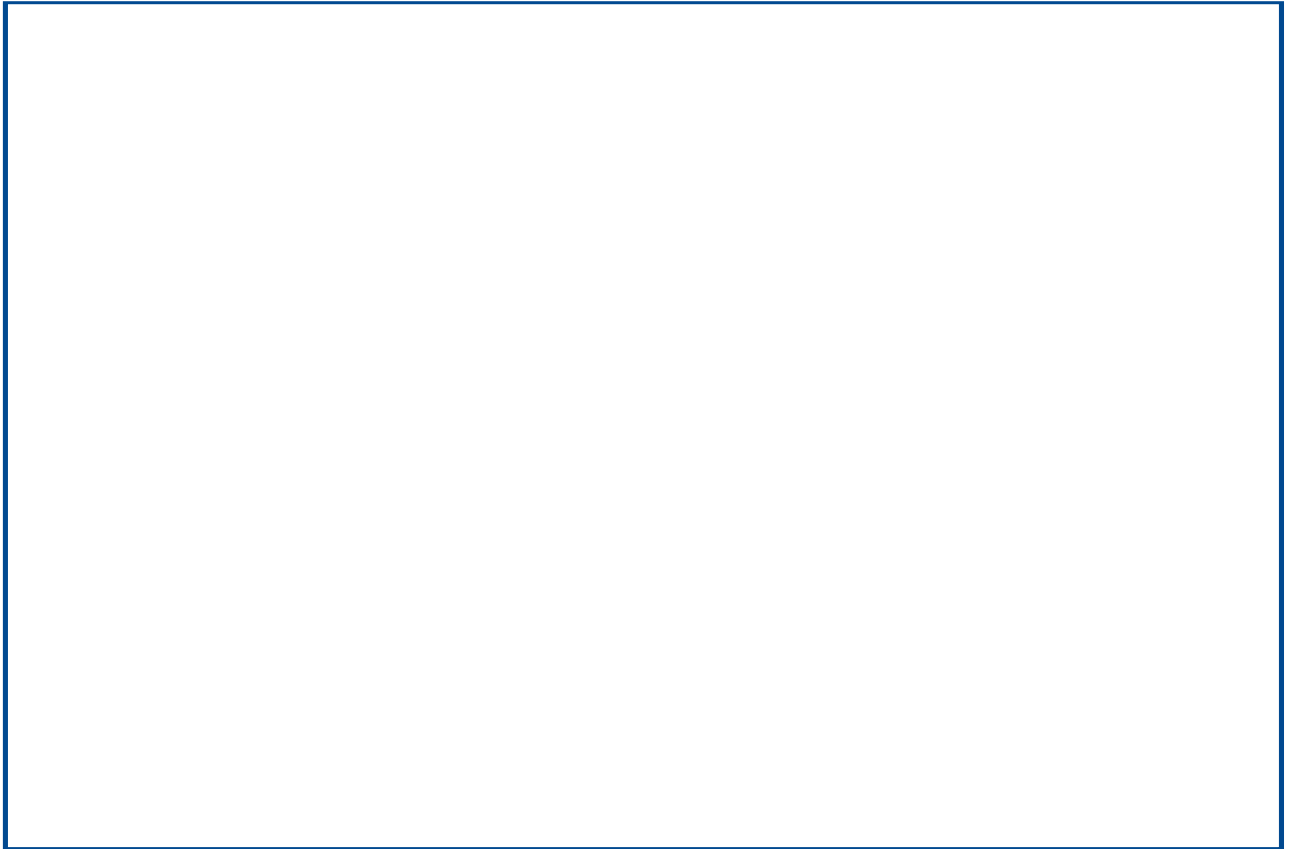
Watch a video on pipeline freezing operations at www.nebosh.org.uk/psm-activity-sheet-videos/

Element 3.5: Electricity and static electricity



Activity

Watch a video which shows an electrical arc flash demonstration at www.nebosh.org.uk/psm-activity-sheet-videos/





Activity

Watch the videos on UPS at www.nebosh.org.uk/psm-activity-sheet-videos/

Element 3.6: Dangerous substances



Activity

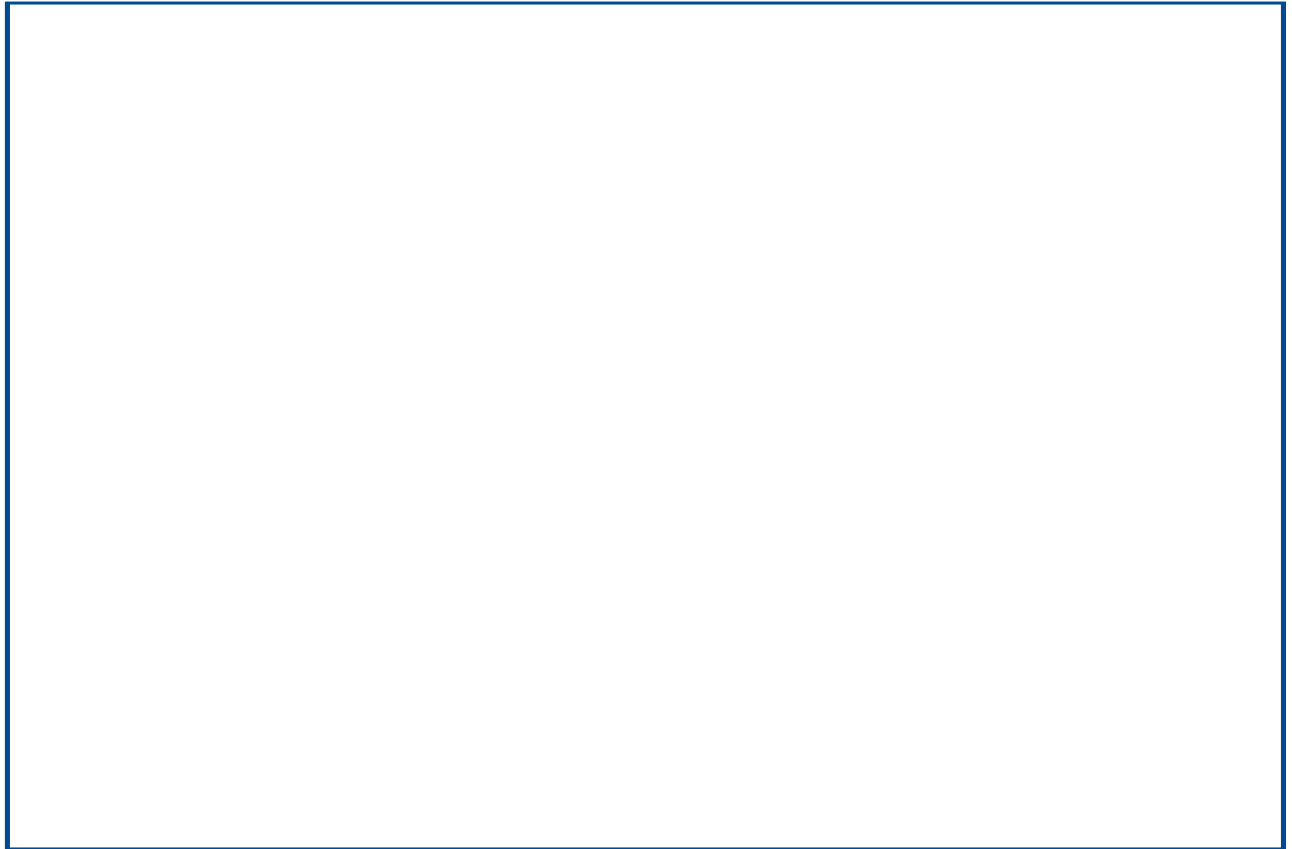
Watch a video on the fire at Allied Colloids Ltd at www.nebosh.org.uk/psm-activity-sheet-videos/

Element 3.8: Bulk storage operations



Activity

Watch the videos to see what happens when a storage tank is not properly vented at www.nebosh.org.uk/psm-activity-sheet-videos/

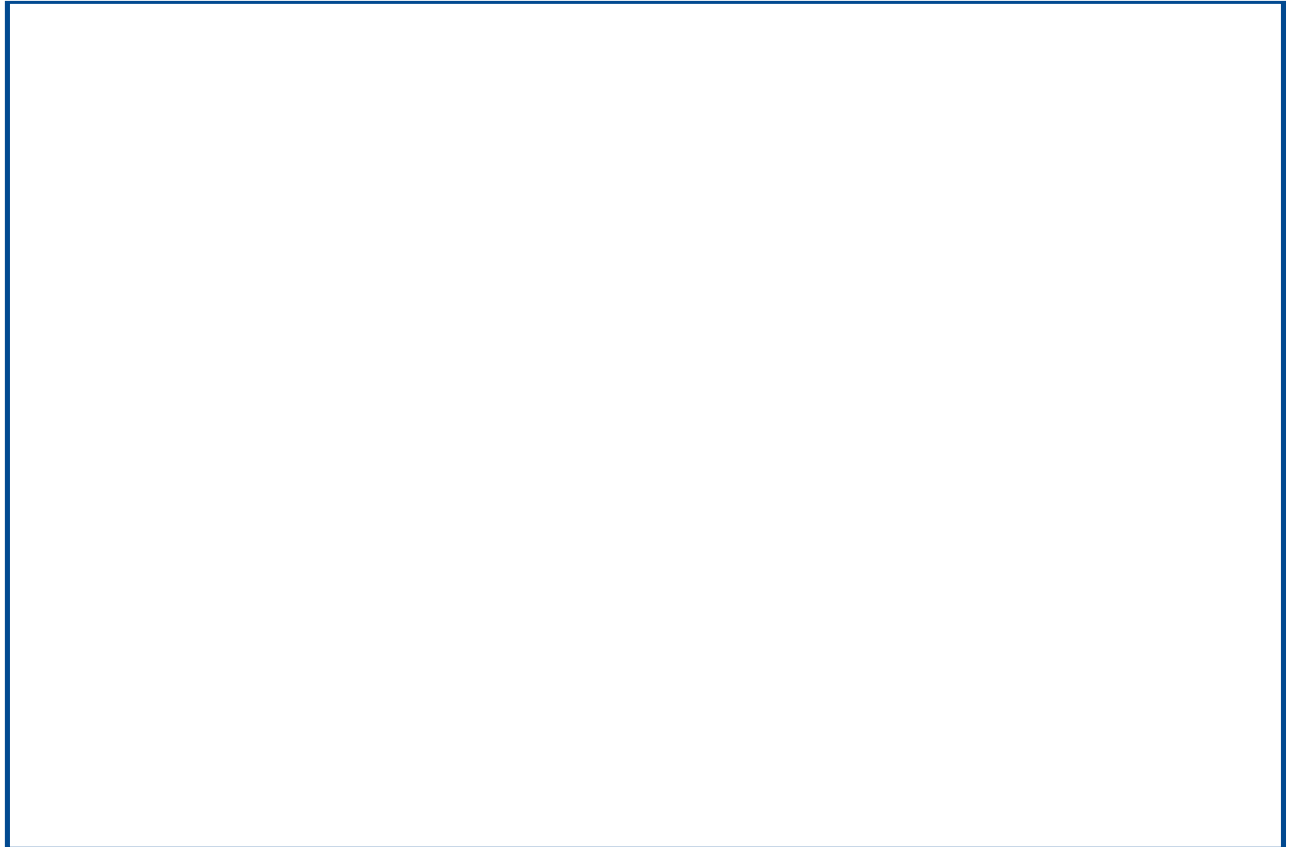




Activity

Read HSE's guidance about general considerations for storage of these liquids in bulk:

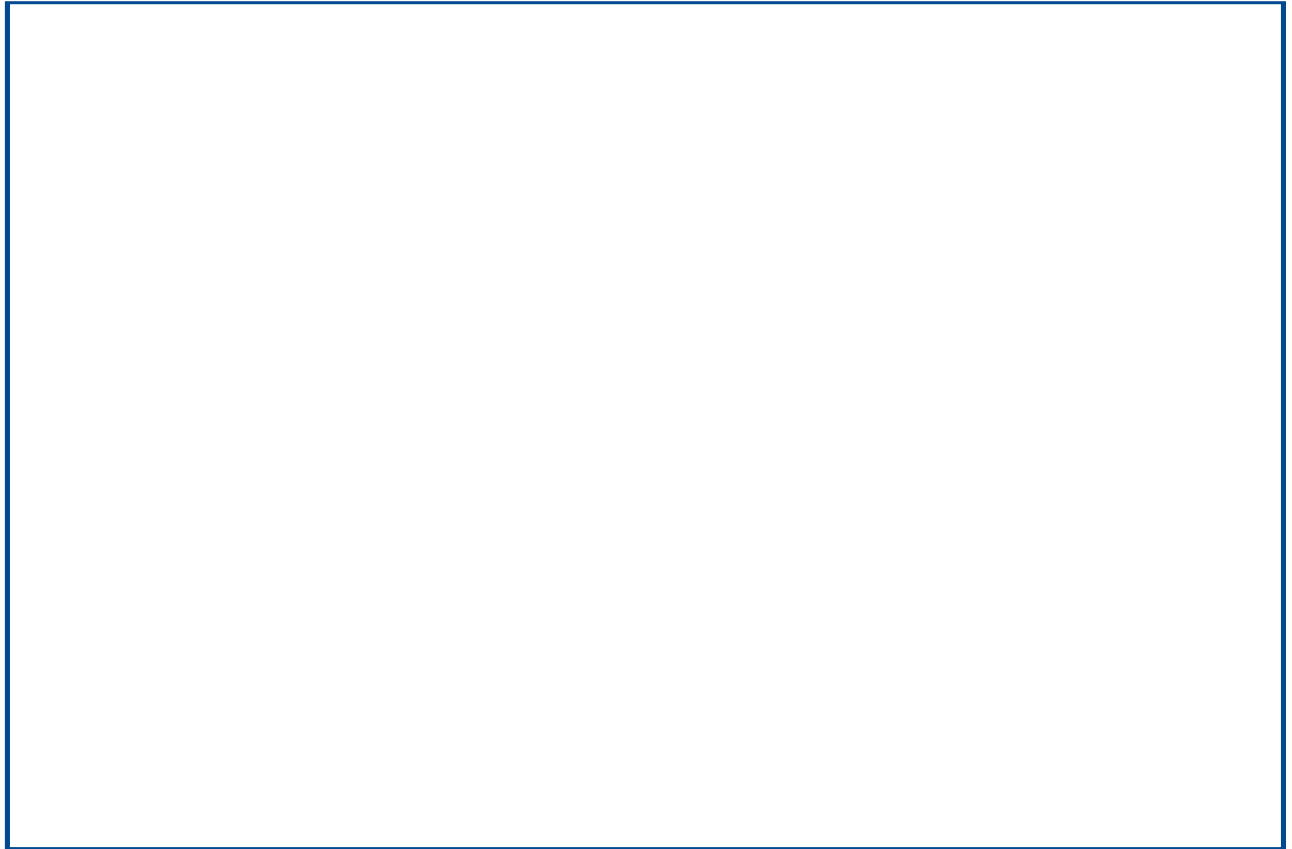
Storage of flammable liquids in tanks (HSG176)





Activity

Read more about chemical warehousing in the HSE publication *Chemical warehousing: The storage of packaged dangerous substances* (HSG71).





Activity

Refer back to the Allied Colloid Fire example discussed in Element 3.6. In relation to assessing potential chemical hazards, how could the incident have been avoided or mitigated?

Think about:

- the hazard categories of the substances involved;
- their compatibility and segregation arrangements;
- the quantities likely to be stored;
- sources of ignition or thermal decomposition (for thermally unstable compounds);
- the impact tackling the fire may have on the environment (pollution).

Element 4.1: Fire and explosion hazards



Activity

In your workplace, what fuels are present? What ignition sources are present?
Can these be eliminated?



Activity

Watch a video of a BLEVE at www.nebosh.org.uk/psm-activity-sheet-videos/



Activity

Watch a video of the Buncefield explosion report at www.nebosh.org.uk/psm-activity-sheet-videos/

Element 4.2: Fire and explosion control



Activity

While sprinklers are highly effective, the damage that can result from accidental operation is not to be underestimated and, therefore, controls need to be in place to avoid accidental damage. Think about ways in which the sprinkler head can be damaged or accidentally operated in a warehouse or factory.

Element 4.3: Dust explosions



Activity

Are there any combustible dusts in use in your workplace? What about in your kitchen? If we handle combustible dusts in the home, such as while baking, why are there not dust explosions happening in homes every day?



Activity

Watch a video “Inferno: Dust explosion at Imperial Sugar” produced by the Chemical Safety Board (CSB) at www.nebosh.org.uk/psm-activity-sheet-videos/

Element 4.4: Emergency preparedness



Activity

Think about potential incidents on your site:

- Who takes the lead during the incident? Are they on site all the time or are they called in?
- What training have they received?
- What specialists are utilised? How are they contacted?



Activity

When did you last hold an emergency drill on site? What did it involve?
What conclusions were drawn and what action was taken as a result?