Process Safety Webinar Series - Part 4

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CAIA Chemical & Allied Industries' Association

SOAS

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Auditing the Control Room

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Introduction

Visiting the control room should be part of:

- A process safety audit, whether internal or external.
- A plant inspection by management.

What should be looked at in the control room from a Process Safety perspective?

Shift Logbook

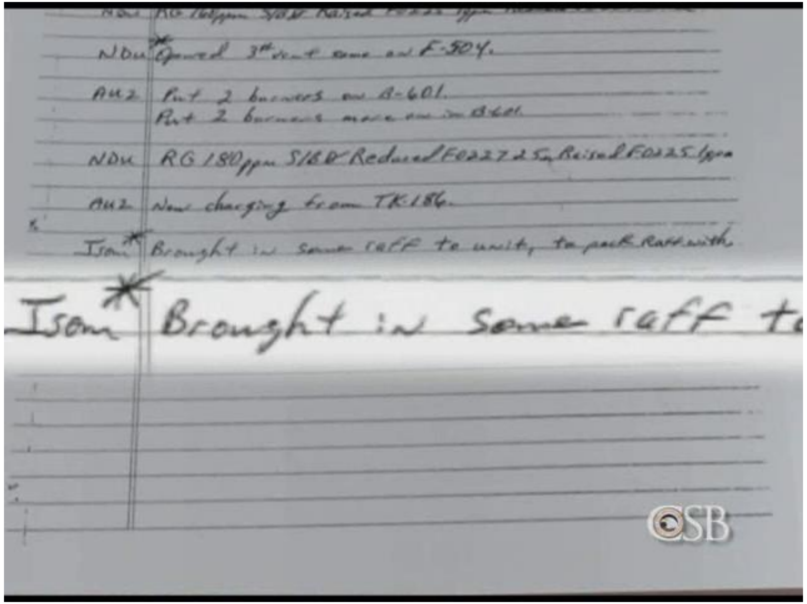
Remember the BP Texas City logbook?

- The morning before the explosion.
- Just one meaningless sentence!

Piper Alpha: Next shift not informed that pump repairs were not completed.

The logbook may be:

- Handwritten or pre-printed forms.
- Batch record by step and time.
- Electronic.



NDu RG 160ppm S/BD Raised F0225 [illegible]

NDu * Opened 3rd vent some on F-504.

AU2 Put 2 burners on B-601.
Put 2 burners more on in B-601.

NDu RG 180ppm S/BD Reduced F0227 25gpm Raised F0225 1gpm

AU2 Now charging from TK186.

Isom * Brought in some raff to unit, to pack raff with.

Isom * Brought in some raff to

Shift Logbook

What is expected:

- Normally it is best to make entries during the shift and not leave everything to the end of each shift.
- Clear notes on what the next shift should know.
- Report on open work permits.
- Incomplete activities.
- Instructions received, etc.

Shift Handover

Verbal communication between outgoing and incoming shift:
Discussion about things the next shift should know.
Time is always a limitation: Is it OK if handover takes place in the change room?
Some companies pay overtime so that a proper shift handover can be done.

Does the company have rules about what is expected from shift handover process?
Any shift handover training?

It is not so easy to get this information during an audit:

- Ask supervisors.
- Observe shift handover.
- Check logbook for completeness.

Alarm and Trip Management

Issues to be considered:

1. Alarm prioritisation: Different sounds or colours for different alarms.
2. Alarm overload, especially during abnormal conditions. (Three Mile Island nuclear plant example)
3. Nuisance alarms.
4. Trip override management.

Note: Alarms on a batch plant may have to be viewed differently as alarms may indicate the end of a step and does not necessary indicate an emergency.

Plant Alarms

The following may indicate deeper problems:

1. How does the plant operator respond to incoming alarms? Accept alarms without looking?
2. Alarm volume is turned down.

Why is this behaviour unacceptable? Alarms are protective controls.

Possible reasons for behaviour:

1. Alarm overload: Max 4 per 10 minutes per operator (typical figure).
2. Nuisance alarms: Repeated unnecessary alarms either by error or fluctuation of variable.

How to get these answers?

Look at alarm page or alarm printout of say 100 most recent alarms.

1. Were there any 10-minute period where there were more than 10 alarms?
2. Check for repeat alarms: Comes on and off every few minutes. This can be fixed!

Trip or Interlock Override Process

Trips or interlocks are protective controls, included in the design following a HAZOP or similar process. If one is out of operation, we are at risk.
Often, there are circumstances where a trip or interlock needs to be bypassed, for example, calibration, functional testing or repairs.

Trip bypass needs be done in a controlled manner with due consideration of the risk, through some permitting process.

Typically, the trip override process is managed using:

1. A trip override register.
2. A trip override permit system.

In addition, there should be a sense of urgency to return the override to normal as soon as possible.

Trip Override Auditing

Issues to look for in the trip override process:

1. Was a risk assessment done and any special precautions implemented to manage the risk of a missing control?
2. Approval by higher authority?
3. Reason for trip override explained and reasonable?
4. Have sign-off once put back to normal operation been missed?
5. Any trips forgotten in the override position? Sense of urgency?
6. Are operators aware of which trips are in override?
7. Is the message carried from shift to shift in case of a long override?

Note: A trip override meets the requirements of a **Temporary MOC**.
However, the normal MOC process does not have the urgency and processes to swiftly deal with an override that may last an hour.

Emergency Response at Plant Level

Emergency response normally focus on site wide evacuation and responses.

However:
Plant specific emergencies may include release of a toxic, flammable or otherwise hazardous material or a fire.

Plant operations personnel are the first responders. Will they know what to do? Do they understand the safety risks, when to go in and fix or when to evacuate?

Do they know how and when to do an emergency shut-down.

Plant operating procedures should cover these first responder activities and associated training, including related safety risks.

Checking Plant Emergency Readiness

1. Ask operators what they would do in a specific scenario, say a chlorine pipe gasket failure.
2. Is there a written procedure covering this and is it adequate?
3. Were they trained in these aspects?
4. Are emergency shutdown processes understood?
5. Do they know where battery isolation valves or emergency shut-off buttons are and are they accessible?

While in the Control Room:

1. Check the First Aid box: Sealed, stocked, checked.
2. Are there checklists that operators need to complete, e.g., tanker loading or unloading. Are these being done while the job is in progress or afterwards?

Thank you

Any questions?

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