

Reviewing and Revising Safety Cases – Start with the end in mind!

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Safety Case
Symposium 2018
Singapore

Overview

- Safety Case Overview
- Legislative Requirements for Review and Revision
- Review and Revision
 - What needs to be considered
 - Suggestions for success (or at least avoiding failure)

Safety Case Overview

- The Safety Case demonstrates how safe operation is achieved and maintained over the life of the MHI.
 - It is intended to be a 'live' document
 - Any events or changes that impact on the ability of the MHI to operate safely, should result in a revision of the Safety Case.
- Whilst the development of the Safety Case is understood. Updating and maintaining the Safety Case to ensure it remains current continues to be problematic.
 - Usually because the Safety Case development process is seen as a project, a one-off task to achieve a specific goal.

Legislative Requirements

...the occupier of a MHI must keep and maintain a safety case ... (R.5)

Specifics provided in R.17:

- At least once every 5 years or as directed by the Commissioner.
- Whenever —
 - (a) there is new technical knowledge ... in relation to the cause, prevention or effect of a MA, including from —
 - (i) an incident or near miss within the MHI; or
 - (ii) publication of an incident or near miss (whether or not within the MHI);
 - (b) ... knowledge in relation to any MA hazard that is within the MHI; or
 - (c) ... a change to the management system that has a significant impact on the prevention of a MA or the limitation of consequences of a MA.

Safety Case Maintenance

- The 5 year review is important as it:
 - Captures incremental changes that have occurred;
 - Realigns the Safety Case based on experience of the effectiveness of control performance;
 - Allows for increased operator awareness of the MHI safety; and
 - Ensures an ongoing focus on MAs.
- The Safety Case should be structured to allow you to revise the Safety Case elements without having to redo the entire Safety Case from scratch.
 - Use the MHI's systems and processes to prepare the Safety Case; and
 - Involve the MHI's personnel in the Safety Case development tasks.

Safety Case Maintenance

- Issues can arise in the 5 year review due to:
 - The Safety Case utilising different assessments from different eras. Over time there become harder to integrate.
 - Poor planning of the revision process.
 - Complex processes used for the Safety Case demonstration.
 - Changes in personnel involved in the Safety Case over time (particularly for complex Safety Cases).

Incidents and Near Misses

- The incident investigation / review should include consideration of:
 - Previously unidentified MA that may occur at the facility?
 - New causes or contributing factors for MA?
 - Is an already identified hazard more likely to cause a MA than assumed in the risk assessment?
 - Could the consequence of an existing MA be more or less severe than previously expected?
 - Are additional control measures needed, or does the performance of an existing control need to be improved?

Incidents and Near Misses

- Also need to consider whether changes are required to the SMS e.g.
 - Changes to operating procedures;
 - New training for personnel; or
 - Changes to maintenance practices.
- Published investigations such as Buncefield also trigger reviews.
 - Before that incident, the generally accepted that the worst outcome after a tank overflowed would be a full bund fire.
 - Buncefield demonstrated that, if a tank overflows at a rapid rate, a vapour cloud can form, the vapour cloud explosion having far more destructive effects than a bund fire.

Incidents and Near Misses

- Issues to avoid:
 - Personnel focusing on the direct cause or the industry class rather than the contributing factors of the incident.
 - Lack of transparency in the Safety Case, so only a few people can identify is an incident warrants review and revision.

SMS Triggers

- Include prompts to trigger a review, and if necessary revision, of the Safety Case
- Consider checklists and Incident reporting processes:
 - Impact on MA, cause or controls
 - New MA, cause or control
 - Impact on KPI for a control
 - Etc.

major incident occurs at the facility.¶

Table 1: Incident review against Safety Report requirements.¶

Dangerous Good ^α	Ammonia Anhydrous 1005 ^α
Major Incident (as per Safety Report Classification) ^α	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Major Incident 11 – Loss of Containment (LOC) from storage tanks. ^α
Critical Controls Involved (as per Safety Report) ^α	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Safety Critical Element (SCE) 10 Pressure Relieving / Protection Systems ^α
Safety Report to be revised ^α	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <u>This is currently covered within Safety Report.</u> ^α

Table 2: Consequence severity Matrix (Ref HORS 0.04 Process Safety Management)¶

Management of Change

- Changes occur in all operations. These changes may result in changes to processes; equipment; quantity or type of chemicals; number of people etc.
- A change may:
 - Introduce new hazards;
 - Introduce new failure mechanisms for controls or compromise a control;
 - Change chemicals used in the process;
 - Change operation of controls or require the addition of new controls; and
 - Change the severity or magnitude of consequences.

Management of Change

- Poor Management of Change has been a cause or contributing factor in most major incident:
 - Flixborough, UK 1974
 - Bhopal, India 1984
 - Chernobyl, USSR 1986
 - Piper Alpha, UK 1988
 - BP Texas City, USA 2005

Management of Change

- The key is 'manage' the change.
- The legislation makes reference to 'significant impact'. This needs to be defined by the MHI in agreement with the Regulator.
- Include potential impact on the Safety Case early in the planning process.
- Lack of transparency in the Safety Case, so only a few people can identify is a change warrants review and revision.

Safety Case Structure for Success

- Keep the structure simple so operations personnel can identify where the information is for MOC and incident investigation processes.
- SMS processes need to embed prompts in the MOC and incident investigation processes for people to check the potential impact on the safety case as part of the process – rather than after the fact.

Conclusion

- Safety Case planning needs to include consideration of the review and revision requirements.
- Involve operations and maintenance personnel in the development of the Safety Case.
- Keep the Safety Case simple so operations and maintenance personnel can understand and maintain it through MOC and incident investigations.
- Keep the Safety Case up to date so it reflects the operation of the facility.
- Include prompts in the relevant sections of the SMS to trigger review of the Safety Case. Develop checklists to provide assistance and evidence of the review process.

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