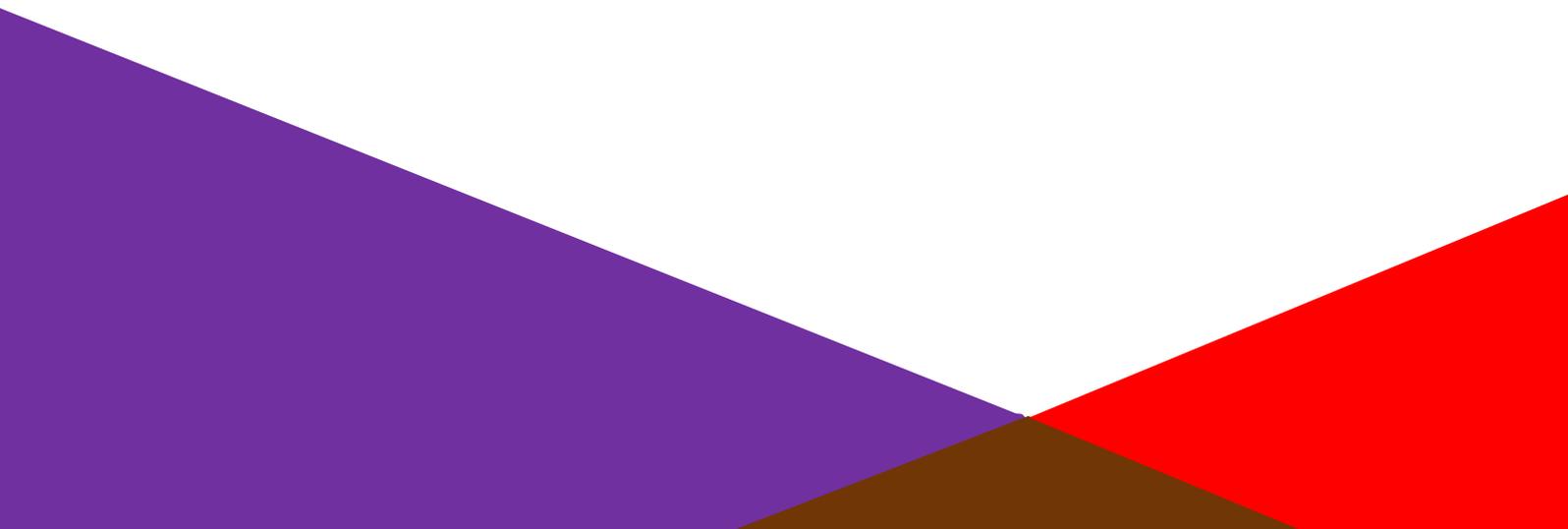


MANAGING CHANGE



Risk Control Guide

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Introduction

Effective management of change is critical to preventing or controlling property loss and subsequent business interruption. Some changes directly affect an organisation, for example, new construction, a new equipment installation, process changes, storage arrangement and commodity classification changes, etc. Other changes are indirect, for example, changing market conditions, changing regulations, recognition of new hazards, etc.

Although most changes are made with positive intent, changes can increase the severity or frequency of property loss. Whenever change is contemplated the increased loss potentials and hazards associated with the change need to be identified and assessed and then subsequently addressed by the implementation of suitable risk reduction measures.

The concept of change management has been a critical part of the risk management philosophy in the petroleum, chemical and nuclear power industries for decades due to the severe hazards present. However, other businesses also present challenges with respect to managing change. There may not be dedicated process safety or loss prevention staff in place and project reviews may often be performed by a single plant engineer, operations manager or maintenance manager. Additionally, many tasks are outsourced to outside contractors who do not have a vested interest in the facility. Losses resulting from an improperly managed change can be devastating for all businesses.

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Loss Examples

On 1st June 1974, the Flixborough Works of Nypro (UK) Limited, experienced a massive vapor cloud explosion, killing several people onsite and causing injuries and property damage within a large area surrounding the plant.

Cyclohexane was used in a series of six reactors in sequence. The reactors were interconnected by pipework with corrugated expansion bellows installed at the vessel outlet and inlet flanges.

Reactor 5 had been removed from service to allow needed repairs to be made. To permit continued operation, a temporary piping assembly was fabricated to bridge the gap between the outlet on reactor 4 and the inlet on reactor 6. Because of the elevation changes, the temporary pipe was not straight and had bends in it. The only support for the temporary pipe was the scaffolding on which it rested.

The temporary pipe performed satisfactorily for two months until a slight rise in the pressure occurred, causing the pipe to twist. The bending moment was strong enough to tear the bellows. When the piping failed, an estimated 27-45 tonnes of cyclohexane vapour were released resulting in a vapour cloud explosion. The explosion and subsequent fires totally destroyed the plant.

The lack of a systematic evaluation to consider the hazards and consequences of a modification/change is one of the primary lessons learned from this incident. Failure to recognize the need to restrain the pipe resulted in the failure of the bellows and the loss of containment of the material.

On 25th September 1998, an explosion occurred at a gas plant at Longford, Victoria, Australia. The explosion killed two workers, injured eight others and resulted in interruption to Melbourne's natural gas supply for two weeks. As well as this direct impact upon the company itself the loss cost offshore property insurers in excess of £270M. The direct cause of loss was identified as cold metal embrittlement in a heat exchanger that manifested itself after a process upset.

A Royal Commission investigation concluded that corporate management of change standards were not followed with respect to plant interconnections, equipment modifications and staffing changes, which all contributed to the conditions that allowed this loss to occur.

In 2016 a food manufacturing company installed a new baking line into a warehouse which contained combustible commodities in high racked storage. The warehouse was also constructed with areas of combustible materials which added to the available fire load. An oven fire subsequently occurred which spread rapidly to the adjacent stock and combustible construction materials leading to a significant loss and associated business interruption. No assessment was made of the risks associated with installing the bakery line in a warehouse containing large quantities of combustible stock and construction materials.

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Develop a Procedure

In order to effectively manage change within an organisation a written procedure should be established and implemented. The procedure should be flexible enough to accommodate major, minor and temporary changes as well as emergency repairs and should be tailored to the size and complexity of your organisation.

Include the following steps within the procedure:

- Define the physical areas, processes, equipment, procedures and job functions that are of concern and which need to be covered by the procedure.
- Identify the most likely changes in advance and plan for them.
- Define benign changes, minor modifications and replacement in kind activities that are either outside the scope of the procedure, or that require a simplified review process.
- Define specific requirements for emergency repairs.
- Define the roles and responsibilities of individuals and departments that are required to participate in the change management process.
- Define specific requirements for monitoring employees and outside contractors that are involved with implementing changes.
- Establish a “Request-For-Change” (RFC) procedure that clearly states which reviews and approvals are needed before specific types of changes may be implemented.
- Form a dedicated project management group that will be responsible for initial screening, gathering feedback, validating action points and following changes through to completion.
- List outside parties that are to be involved in the review process (for example property insurers, fire departments, etc.)
- Train personnel who will be involved in implementing changes. Include equipment operators and maintenance personnel.
- Integrate the process into the organisation.
- Periodically review and update the procedures based on experience.

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Suggested Process

This process below can be modified based on the size, complexity and hazards present:

- Prepare a Request-For-Change (RFC) form and submit it to Project Management.
- Project Management will review the form and determine the appropriate review process per the written procedures. They will submit the RFC to the appropriate individuals, committees, departments and outside agencies or return it to the originator with explanatory comments if no action is required.
- Those allocated the task of reviewing the RFC will conduct their review, identify potential hazards and develop loss scenarios with consideration to the effect on upstream and downstream processes, operations, customers and vendors. Document important conclusions, recommendations and thought process and formally reply to Project Management.
- Project Management will coordinate and review the feedback, validate the action points and seek management approval for authorising any changes required.
- Project Management will communicate required changes to those responsible for implementing them and will follow-up as required to ensure that all issues are addressed. This step could involve a re-review and approval of plan revisions, routine inspections, progress meetings, or involving those with specific expertise as required.
 - Prior to starting up or using the change it should be confirmed that the change has been implemented as intended and that all action points have been addressed.
- After completion Project Management will file completed documentation for future reference.

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A Useful Checklist

Use or modify the checklist below to assist with the review process:

- Work methods safe?
- Ignition sources controlled?
- Suitable location?
- Suitable construction materials?
- Material Safety Data Sheets available?
- Adequate and reliable fire detection and protection? Is existing fire protection adequate for proposed change i.e change in commodity or increase quantity/format of existing commodity?
- Explosion prevention measures taken?
- Adequate alarms and response?
- Required safety interlocks?
- Instrumentation and controls satisfactory?
- Adequate pressure relief devices and flame arresters?
- Chemical reactions controlled?
- Inert gas and purge requirements met?
- Adequate fireproofing of metal supports and critical control systems?
- Suitable electrical equipment for hazardous locations?
- Electrical grounding provided?
- Corrosion control measures taken?
- Satisfactory piping and equipment identification & labelling?
- Adequate spill control systems?
- Adequate ventilation systems?
- Inspection, maintenance and testing considered?
- Operator training and procedures satisfactory?
- Relevant documentation updated?
- Approvals required by regulators, authorised bodies and other interested parties?
- Is a more rigorous risk assessment required e.g Hazop?

Disclaimer

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