Marsh

Marsh Specialty

Management of organizational change

Minimum staffing

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Contents

1 Background

Organizational change – ranging from mergers and acquisitions to shifts in reporting lines to movement of staff and more – is a normal part of business life, including in the energy and power industry. Organizations in which major hazard risks are present should have highly reliable systems in place to manage such changes in order to ensure the safety of people and property and protect against potentially devastating incidents and high-value losses.

In the energy and power industry, some organizational changes – for example, changes to minimum staffing levels – are not always analyzed and controlled as thoroughly as engineering changes, such as those made to a plant's operation. But in any part of an organization, insufficient analysis can increase the potential risk of accidents.

Compared to engineering changes, the impacts of organizational change are typically less understood, and the risk assessment processes less robust. In general, organizational changes are made by management in a "top-down" manner, with risk assessments typically carried out after a change is decided and/or in place.

This report aims to help operating sites identify various types of organizational change and provide practical guidance on how to manage them. It focuses further on effectively identifying and managing minimum staffing levels – a key criteria during underwriting assessments by insurers.

Objective

This position paper defines some of the key attributes for managing organizational change as it relates to minimum staffing policies and key procedures required in the oil, gas, petrochemical, and power sectors.

These attributes are based on Marsh's risk ranking criteria. They can be used to support and define risk improvement recommendations and provide detailed advice to clients seeking to improve their management systems.

3 Scope

3.1 Identifying and managing organizational change

This position paper includes guidance on identifying when a management of organizational change (MOOC) process is required, and how to develop a risk assessment for sites that must manage major accident hazards.

The paper is intended primarily for operational management teams, rather than corporate management. Throughout the paper, the word “site” refers to the part of the organization carrying out the organizational change. Depending on the nature of the change, this could be a single plant, multiple plants on the same site, or multiple sites.

3.2 Minimum staffing

It is good practice (and sometimes a legal requirement as part of a license to operate) for sites to have a statement documenting the minimum staffing requirements for safe plant operation. This may directly or indirectly affect the control of major hazards and detail the required actions up to and including the shutdown of the site if minimum staffing levels are not met. A site should also have a documented methodology outlining how the minimum staffing requirement has been determined.

Specific requirements

4.1 Organizational change

All sites should have a comprehensive, documented local policy and procedure governing the MOOC. Any corporate expectations for a MOOC should be available to the organization's operating sites and incorporated into the site documents as appropriate.

The policy requirements and guidelines should effectively manage all organizational and personnel changes relating to health, safety, and environmental (HSE) critical roles. This policy should ensure that any such changes are properly risk assessed and that minimum levels of competence and staffing for managing safety critical activities are defined and maintained within the safety critical roles.

The policy needs to clearly define:

- What is an organizational change and when the MOOC process should be applied (see section 4.1.1 below).
- The roles and responsibilities of the key people who operate the MOOC process (see section 4.1.2).
- The important steps in the MOOC process (see section 4.1.3).

A checklist is included in Appendix A to help assess if a MOOC process is required.

Comprehensive documentation and training procedures for responsible personnel are necessary for an effective MOOC system. This is covered further in Appendix B, Actions – to be completed before the MOOC is signed off as complete.

4.1.1 Definition of a change

A MOOC is required to ensure that all safety critical tasks and decisions are carried out by competent staff, that these tasks are not omitted, and that staff are not overloaded as a result of the organizational change.

The types of changes that could require a MOOC include:

- A reduction in workforce/staffing numbers.
- The impact of mergers, demergers, or acquisitions.
- Departmental mergers.
- Centralizing or separation of functions within the site's organization.
- Any change that impacts emergency response capability.
- Delayering or organizational hierarchy changes.
- Multi-skilling.
- Moving staff from onsite to an offsite or remote location.
- Merging of positions.
- Increasing spans of control.
- Outsourcing safety critical functions.
- Service provider change.

The types of changes that may not require a MOOC include:

- Reduction of staff performing non-safety critical roles.
- Merging departments that do not have safety critical positions.
- Changes in shift patterns, as long as operator competence is maintained and the new shift pattern does not increase overall working hours. A human factors assessment can help evaluate aspects such as travel time to and from remote locations.

4.1.2 Roles and responsibilities

The key staff responsible for the implementation of a MOOC include:

4.1.2.1 Departmental or site manager

The size and complexity of the change will determine what level of management approval is needed. Large, complex, site-wide changes are typically the responsibility of the site manager. For changes confined to an individual department, the responsibility usually falls to the departmental manager. The manager is responsible for initiating and defining the change and appointing a change leader and remains responsible for authorizing implementation of the change, including the go-live date.

4.1.2.2 Change leader

The change leader is responsible for determining the risk assessment requirements. Potential approaches to carrying out the risk assessment are defined in Appendix B.

The change leader should be independent of the change and, if possible, not a direct report to the (relevant) MOOC manager. For example, the change leader role could be allocated to a technical assurance manager.

The change leader appoints change review team members and reviews the actions resulting from the risk assessment.

Once the MOOC is implemented, the change leader should conduct a post-implementation review and close the change.

4.1.2.3 Change review team

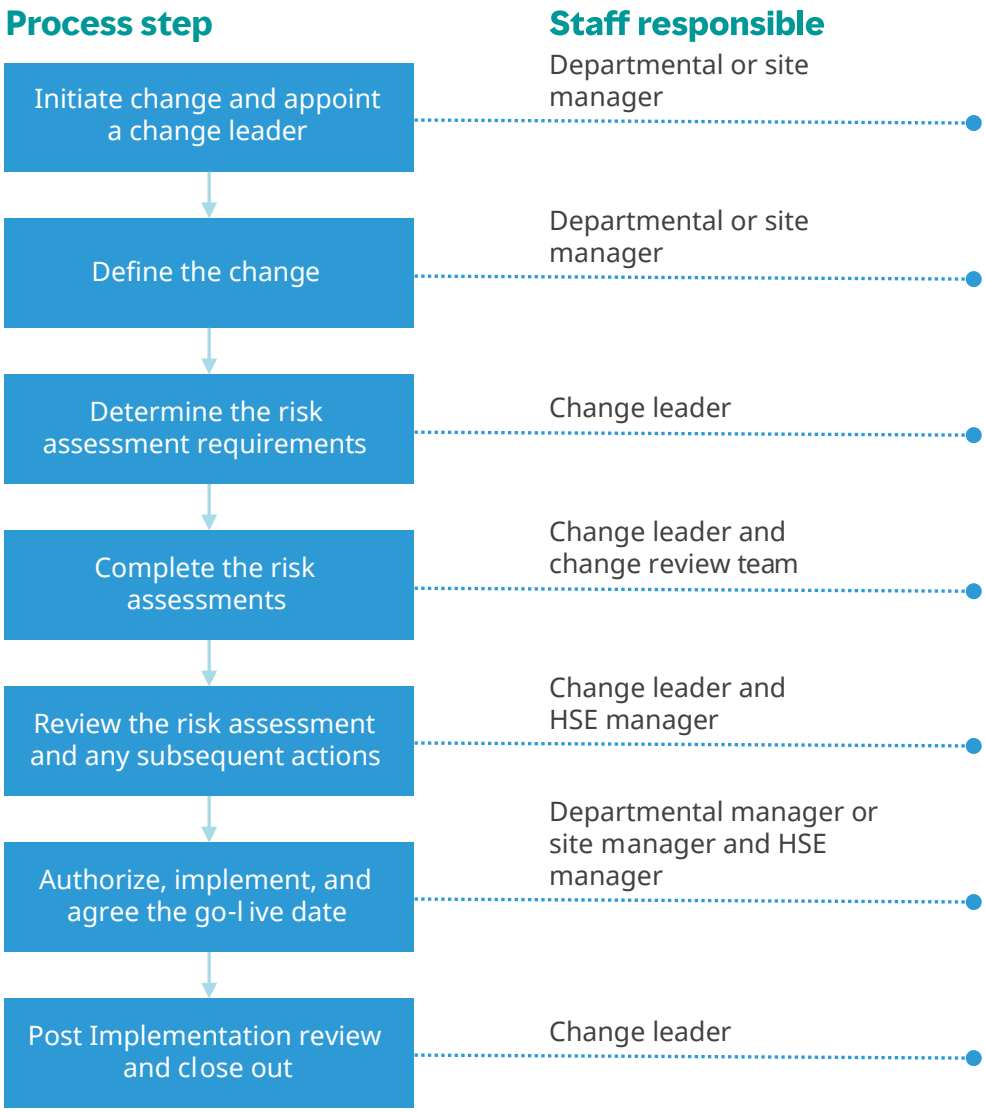
Members of the change review team should be signatories in the site management of change process. The nature of the change will determine the team members required. However, as in any robust management of change process, personnel within the process can challenge the makeup of the change review team and add additional members if required.

4.1.2.4 HSE manager

The HSE manager is responsible for reviewing the relevant risk assessments and authorizing the implementation of the change and the go-live date in conjunction with the departmental or site manager.

4.1.3 Key steps in the process

The following process flow shows the steps and allocated roles in a typical MOOC process.



4.2 Minimum staffing

It is a best practice for a site to have a comprehensive, documented, local policy and procedure specifying minimum staffing levels. This should be incorporated into the site documents, referred to, and adhered to during a MOOC process. If the minimum staffing policy and procedure does not exist, the MOOC change review team should establish the minimum staffing levels and document the methodology.

Good practice empowers the supervisor or manager in charge of a shift operating team to shut down the plant and/or adjust operations to reduce risks to an acceptable level. This should not require a confirmation from the on-call duty manager, and should be able to be verified during an audit.

4.2.1 Emergency response assessment

Minimum staffing for emergency response requirements should be in place to ensure that life and property are protected. An emergency is typically defined as a sudden and uncontrolled event that has the potential to escalate, leading to an unacceptable consequence on the company risk matrix.

A good starting point in an emergency response is to identify and detail the worst case scenarios and assess each shift teams' ability to perform the response actions. The worst case scenarios determine the workforce requirements, and the relevant actions should be aligned to other work processes, such as emergency procedures and fire pre-plans.

For most businesses, the worst case scenario is assumed to be one that occurs during night shifts, weekends, or public holidays, when additional staff (for example, day staff) are less available to respond to an incident. Site procedures are expected to state that emergency response tasks take priority over usual business activities at all times. Marsh can provide a potential risk assessment methodology if required.

4.2.2 Routine operations assessment

A review of the console and outside operators' workloads should be completed to assess minimum staffing requirements during routine operations. This is especially important if a change reduces the workforce level, resulting in a combination of roles.

The routine operations assessment aims to ensure that the routine workload allows for the management of abnormal situations.

For the console operator, the following checks should be completed:

- During routine operations, the base alarm rate per console operator should not exceed existing rates, especially if it is greater than that prescribed under the EEMUA 191 alarm standard. If the alarm rate exceeds the standard, the combination of roles should only proceed when this is rectified.
- The number of control loops the operator has to manage should be benchmarked against other processes on the site. The industry standard is around 250 to 300 control loops, per the EEMUA 191 standard.
- In the case of licensed processes, the licensor can supply data with respect to configurations at other locations as a benchmark.

For the outside operator, the following checks should be completed:

- Define and document tasks for routine operator rounds, which should be comfortably executed within the time available.
- For routine start-up or shutdown activities, sites should consider if additional resources are required; if so, they should be included in the procedure.

4.2.3 Other disciplines assessment

For other disciplines that could be impacted by change, an assessment should be carried out to check that all critical operational work processes can function without impairment.

Stewardship/ governance of process

5.1 Actions

Any actions arising from the MOOC must be recorded in the MOOC documentation system and tracked to completion. The MOOC should not be closed out until all actions, as detailed in Appendix B: Agreeing the A and B list action items, are completed.

5.2 Typical key performance indicators (KPIs)

Key performance indicators are mainly lagging indicators, but they should identify any degradation in HSE performance. They should be trended from the start of the change against historical data.

A degradation in HSE performance may include:

- A trend in increased overtime rate as a percentage of nominal hours.
- Close out of process hazard assessment (PHA) action items.
- Safety critical equipment (SCE) testing or maintenance deferments.
- Competency assessments carried out.
- Temporary MOCs overdue for assessment or closure.
- Inspection items overdue (based on criticality assessment), for example, creep life measurement and calculations close to end of life.
- Any trend that could indicate that people are under more pressure; for instance, increases in absence, illness, lost time injuries, and mechanical or process errors.

6 Industry losses

The two examples outlined below demonstrate the significant consequences of a failure in the MOOC process, and of not maintaining the minimum, appropriate staffing levels.

Hickson & Welch, UK, 1992

In 1992, an accident occurred at the chemical plant Hickson & Welch in West Yorkshire, whereby fires killed five employees while cleaning a vessel containing potentially unstable sludge. It was subsequently found that because of a recent company reorganization, the cleaning was tasked to inexperienced team leaders who reported to an overworked area manager. The UK Health and Safety Executive incident report states, “Companies should assess and monitor the workload and other implications of restructuring levels of management and supervision to ensure that key personnel have adequate resources, including time and cover, to discharge their responsibilities.”

Esso Longford, Australia, 1998

Gas supplies to Australia’s Victoria State were virtually shut down following an explosion and fire at this gas processing plant. The cause of the accident was attributed to the rupture of a heat exchanger following a process upset that was set in motion by the unintended, sudden shutdown of hot oil pumps. The loss of hot oil supply resulted in some vessels being chilled by cold oil. When the hot oil was reintroduced to a heat exchanger the vessel ruptured due to a brittle facture. An initial release of approximately 22,000lb of hydrocarbon vapour exploded, and an estimated 26,000lb burned as a jet fire. The fire burned for two and half days. The incident highlighted how a combination of ineffective management procedures, staffing oversights, communication problems, inadequate hazard assessment, and training shortfalls combined to result in a major plant upset with tragic loss of life. Prior to the incident, a reorganization saw senior technical support personnel relocated from the remote plant to the Melbourne offices which led to limited plant surveillance.

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4. Braben B. and Morris N. "Organizational change: Learning from experience", IChemE. Hazards 29, (2019).
5. "The fire at Hickson & Welch Ltd: A report of the investigation by the Health and Safety Executive into the fatal fire at Hickson and Welch Ltd", HSE Books (1994).
6. "London Emergency Services Liaison Panel (LESLP) major incident procedure manual", (Version 10.1, 2019).

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Appendices

APPENDIX A: SELF-ASSESSMENT CHECKLISTS

The following questionnaire can assist you in initiating a MOOC to assess minimum staffing against the attributes in this paper.

Further consideration should be given to any element where you answer **No**.

Organizational change

Element	Reference	Y	N	n/a
Setup and applicability				
Does the site have a robust procedure for the management of organizational change that covers the following:				
• Definition of a change.	4.1.1 Definition of a change			
• Roles and responsibilities of staff involved in identifying and implementing the change.	4.1.2 Roles and responsibilities			
• A structured, well-documented consistent process.	4.1.3 Key steps in the process			
Has the approach to the risk assessment of the change been agreed?	Appendix B			
Safety critical equipment				
Has the safety critical equipment been identified and preventative maintenance (PM) routines set up?	Safety critical equipment			
After the change has taken place, has an assessment been carried out to ensure that the PM can still be done by competent staff?				
After the change has taken place, has an assessment been carried out to ensure that the staff will not become overloaded with PM tasks?				
Safety critical positions and tasks				
Have safety critical positions been identified for the changed organization?	HSE case			
Have safety critical tasks been assigned to staff in safety critical positions for the changed organization?				
After the change has taken place, has an assessment been carried out to ensure that competent staff will still be able to perform safety critical tasks?				
After the change has taken place, has an assessment been carried out to ensure that staff will not become overloaded with safety critical tasks?				

Element	Reference	Y	N	n/a
Job descriptions and handovers				
Are job descriptions in place for the current organization?	Job descriptions			
After the change, have the job descriptions been amended to reflect the positions in the new organization?				
Have job handover documents been prepared for the new organization?	A Actions – to be completed pre-implementation of go live			
Safety critical work processes				
Has the impact of the change been assessed with respect to the effect on the following safety critical work processes:				
• Permit to work.	Permit to work			
• Emergency response.	Emergency response			
• MOC.	Management of change			
• PHA process.	PHA program			
Organization and function				
Has the impact of the change been assessed with respect to the effect on the following organizational and functional change aspects:				
• Increase in the span of control.	4.1.1 Definition of a change			
• Modification of the location, communications, or time allocated for people to attend meetings.				
• Centralization or decentralization of job functions.				
• Removal of layers in the organizational structure.				
• Change in organization type, asset, functional, matrix.				
• Service provider change.				
• Outsourcing of departmental functions.				
• Moving staff from site to remote location.				
• Merging of similar roles, such as combining the role of console operator.				
• Combining an operations and maintenance role.				
• Staffing for shutdowns, turnarounds, and restreaming.				

Element	Reference	Y	N	n/a
Stewardship and governance				
Have the “A” & “B” action items been agreed with a process for tracking them to completion?	A and B list action items			
Are KPIs in place to monitor the effectiveness of the change?	5.2 Typical key performance indicators (KPIs)			
Have the future training requirement been considered for the change?	B Actions – to be completed before the MOOC is signed off as completed.			
Is a review planned, or been carried out, on the effectiveness of the change?				

Minimum staffing

Element	Reference	Y	N	n/a
Setup and applicability				
Does the site have a robust procedure for defining minimum staffing levels?	4.2 Minimum staffing			
Is the shift manager empowered to take the necessary action if the minimum staffing requirement is not met, up to and including shutting down the plant?				
Is the minimum staffing defined for the emergency response case?	4.2.1 Emergency response assessment			
Has the workload of the console and outside operators been assessed to ensure that they can comfortably manage all abnormal situations?	4.2.3 Routine operations assessment			
Do the routine start-up and shutdown procedures require extra workforce?				

APPENDIX B: ORGANIZATIONAL CHANGE RISK ASSESSMENT

Organizational change risk assessment

Task mapping

Task mapping is a good starting point for the risk assessment of a MOOC. Each new or changed staff role should be risk assessed to ensure that all routine required activities maintain safety critical equipment, carry out safety critical tasks, meet the business needs, and any legal requirements that can be successfully completed.

The change leader determines the risk assessment in consultation with the change review team using the following process applied to each new or changed role:

1. Map the role's tasks that are required to run the business successfully. Include any tasks transferred from other roles; mapping of these roles may also be appropriate to support this activity. These tasks should be contained within generic groups where possible.
2. Allocate the workload for each task.
3. Determine the tasks that are safety critical.
4. Evaluate the total workload for the role.
5. Identify risks to the delivery of all tasks with particular focus on those that are safety critical, taking into account human factors.

Consider the consequence if the task is not completed, any existing safeguards that may be in place, and rank the risk using the site risk matrix. Any tasks that will not be completed and that rank "high" in terms of probability and consequence on the site risk matrix should be designated as "A" actions and must be completed before go-live date.

Consider tasks that have been eliminated, which ought to be added and reviewed.

If any HSE risks of concern have been identified, actions should be recorded to reduce the risk to as low as reasonably practical (ALARP).

Develop KPIs to monitor the impact of the changes, specifically regarding the impact on major accident hazards.

Critical operational work processes

At a minimum, the employees affected by the change within the following systems of work are required to be assessed to ensure that they are not impacted adversely. Task mapping can be used to assist in this process.

Work process	Risk	Risk assessment
Permit to work (PTW)	Overloading of the PTW signatories Maintaining minimum competency standards	Establish the maximum number of discrete tasks that are allowed for each signatory and ensure that they are not exceeded as a result of the change. For example: • Maximum number of permits per day, per permit issuer, and/or plant area. • Similar definitions to be applied during shutdown or construction work. • Maximum number of high risk permits per day, per permit issuer, and/or per area. • Maximum number of gas tests per day for each gas tester. • Maximum number of live permits per field operator per day. If the above maximum values are breached as a result of organizational change, then mitigating measures must be documented in the risk assessment.
Emergency response	Maintain the minimum staffing required	A potential risk assessment methodology can be supplied by Marsh on request.
Management of change (MOC)	Overloading of the MOC signatories Maintaining minimum competency standards	The MOOC should ensure that the MOC signatories are not overloaded and minimum competency standards are maintained for all positions involved in completing a MOC.
PHA program	Impaired delivery of the PHA program	Competent staff should be available during all of the assessment workshops and the MOOC should ensure that resources are available to complete all historical PHA actions and that adequate resources are available to complete the future program.

Work processes that can assist with the risk assessment

The following work processes may already have an element of task mapping and can be used to assist the risk assessment. For example, a robust HSE case will have already mapped the safety critical tasks to staff in safety critical positions.

Element	Description	Risk assessment
HSE case	The HSE case should identify the safety critical tasks to be assigned to staff in safety critical positions, for example within a bow-tie assessment.	The HSE case can be used to ensure that the change will not impair any safety critical tasks.
Safety critical equipment	Most high hazard locations will have defined their safety critical equipment with an associated PM schedule and performance standard.	There should be an assessment to ensure that the schedules for all PMs for SCEs are maintained and that this will not overload the engineering or inspection department.
Job descriptions	It is good practice to have up-to-date job descriptions, which include identification of HSE critical responsibilities.	Job descriptions should be updated as a result of the change to ensure that all staff are competent and that they will not be overloaded as a result.
Competency matrix	A competency matrix should identify the key safety critical skills and knowledge.	Competencies can be mapped to critical functional roles within the organization structure.
RACI chart	It is good practice to develop a responsibility assignment matrix indicating the responsible, accountable, consulted, and informed (RACI).	The RACI chart can be used to map high-level activities against key positions and titles based on their respective organizational structure.

Agreeing the A and B list action items

It is good practice to have an implementation plan in the MOOC form, which includes prioritizing actions either “A” or “B,” with an appropriate closeout date. “A” items must be completed before implementation of the change. “B” items must be completed before the change is closed out.

“A” actions — to be completed pre-implementation of go-live

1. Any tasks identified during the task mapping exercise that rank “high” in terms of probability and consequence on the site risk matrix.
2. Any actions that arise from the assessment of the critical operational work processes with respect to the following:
   - Permit to work
   - Emergency response
   - Management of change
3. Completed organograms.
4. Job handover documents.

“B” actions — to be completed before the MOOC is signed off as complete

1. Any tasks identified during the task mapping exercise that will not be completed that don’t rank “high” in terms of probability and consequence on the site risk matrix.
2. Any actions that arise from assessing the critical operational work processes with respect to the PHA process.
3. Any actions that arise from the assessment of the work processes that can assist with the risk assessment.
4. Training requirements; for instance, this may require any previous job holder remaining in position until the training is completed.
5. A post-implementation review to ascertain if the new organization is working as intended.

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