Organisational change and major accident hazards

Introduction

This information sheet provides guidance for employers responsible for major hazards on how to manage the impact of organisational change on their control of the hazards. It covers offshore and onshore oil, gas, and chemical installations and it will also apply to railway operators and nuclear installations. Following the guidance means that you will be complying with your general legal responsibilities, although there can be additional requirements specific to your industry (see Legal requirements).

It is for employers and senior managers dealing with organisational change, and anyone involved in planning or implementing such change. It will also be helpful to employees and, trade union or staff representatives and safety representatives.

It describes common pitfalls to look for, suggests a three-part framework for managing organisational change, and explains your legal duties as the employer.

Organisational change is a normal and inevitable part of business life in all sectors. But organisations associated with major accident hazards have a greater potential for disastrous consequences and higher costs in terms of lives and money. These consequences mean that organisations managing major hazards must aim for much higher reliability than is normally necessary in commercial decision making.

Overstressed manager

In 1992, at Hickson & Welch, in Castleford fires killed five employees during the cleaning of a vessel containing potentially unstable sludge. Because of a recent company reorganisation, the cleaning task had been organised by inexperienced team leaders reporting to an overworked area manager.[1]

The HSE incident report said: 'Companies should assess ... the workload and other implications of restructuring ... to ensure that key personnel have adequate resources, including time and cover, to discharge their responsibilities.'

Organisational change is often an opportunity to improve health and safety, for example though reappraisal of safeguards or clarification of personal accountabilities. However, HSE's experience is that in many instances organisational changes are not analysed and controlled as thoroughly as plant changes, resulting in reduced defences against major accidents, sometimes with fatal consequences (as in the Hickson & Welch incident). This is because, unlike management of plant change, impacts of organisational change are less well understood, and there is a lack of robust, generally accepted approaches to ensuring safety. This guidance aims to help employers manage change that impacts on health and safety.

What changes?

Many forms of organisational change can affect management of major hazards. Changes could include: changes to roles and responsibilities, organisational structure, staffing levels, staff disposition or any other change that may directly or indirectly affect the control of the hazard. The following are some common management terms for such changes:

- business process re-engineering;
- delayering;
- introduction of 'self-managed' teams;
- multi-skilling;
- outsourcing/contracterisation;
- mergers, de-mergers and acquisitions;
- downsizing;
- changes to key personnel;
- centralisation or dispersion of functions;
- changes to communication systems or reporting relationships.

The main focus of this guidance is on change at operational and site level. It is also relevant to changes at corporate level which can have a significant impact on safety at operational level. Examples of this include changes in reporting relationships, objectives, resources, management system, available expertise for design, engineering support, procurement and so on. Although the guidance is specifically about major accident prevention, the processes outlined should have benefits for other aspects of health, safety and environmental management, and even commercial risk.
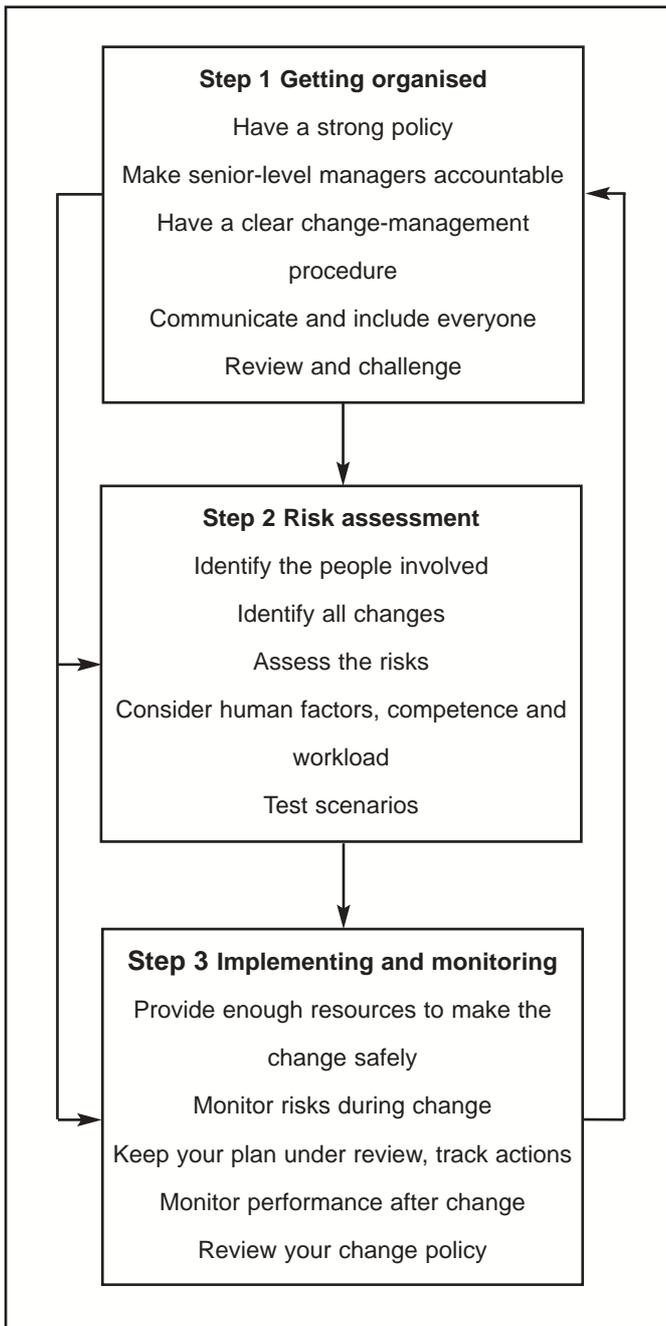
How to use this guidance

This guidance sets out a three-step framework:

Step 1 - Getting organised for change
Step 2 - Assessing risks
Step 3 - Implementing and monitoring the change

Each step is explained and various important topics are covered which you should address at each stage of the process. Use these steps to plan and manage your organisational changes.

Figure 1 Managing organisational change

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│  ┌───────────────────────────────────┐   │
│  │   Step 1 Getting organised        │◄──┐
│  │   Have a strong policy            │   ││
│  │   Make senior-level managers      │   ││
│  │   accountable                     │   ││
│  │   Have a clear change-management  │   ││
│  │   procedure                       │   ││
│  │   Communicate and include everyone│   ││
│  │   Review and challenge            │   ││
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│                  │                        ││
│                  ▼                        ││
│  ┌───────────────────────────────────┐   ││
│──►│   Step 2 Risk assessment          │   ││
│  │   Identify the people involved    │   ││
│  │   Identify all changes            │   ││
│  │   Assess the risks                │   ││
│  │   Consider human factors,         │   ││
│  │   competence and workload         │   ││
│  │   Test scenarios                  │   ││
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│  ┌───────────────────────────────────┐   ││
│──►│ Step 3 Implementing and monitoring│   ││
│  │   Provide enough resources to     │   ││
│  │   make the change safely          │   ││
│  │   Monitor risks during change     │   ││
│  │   Keep your plan under review,    │   ││
│  │   track actions                   │   ││
│  │   Monitor performance after change│   ││
│  │   Review your change policy       │   ││
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STEP 1: GETTING ORGANISED

Policy

The organisation should have a clear policy for management of organisational change. This should set out principles, commitments and accountabilities in relation to impact on health, safety and the environment. Ideally the policy should commit to proportionate consideration of all organisational changes, large and small; as even those not at first connected to safety need to be given consideration to confirm whether or not they may have indirect impacts on safety.

Commitmentandresources

Although the motivation for the change may be commercial, and not obviously connected with safety, major accident prevention must be regarded as core business, not a side issue. Senior management need to demonstrate a clear commitment to safety by their actions, from the outset.

There should be a distinct safety focus within overall change processes, with positive objectives. Make a senior, highly influential manager the sponsor or champion for this. They should ensure the safety aspects of the change receive an appropriate level of resource and attention.

The effort and resource put in must be proportionate to: the complexity of the change; the scale of the hazards concerned; and the degree to which the change may impact on the management of major hazards. This can be by categorising of changes, with greater importance and a higher level of management approval for more safety-significant categories.

Clearsystems

Organisational change should be planned in a thorough, systematic, and realistic way. You should follow a documented and structured procedure for each element of organisational change management. This is similar to the processes for managing plant change. The following should be clear:

● Identify the processes or activities that are to be carried out (to ensure that risks arising from the change are identified, assessed and reduced to as low as is reasonably practicable).
● Set out the protocols to be followed.
● Who is accountable and who is responsible for these activities?

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- Who else is involved, and how?
- What potential risk factors are to be considered? (See examples under Step 2.)
- Who reviews the change process, when and how?

The design of the procedure should take into account:

- this guidance;
- previous experience of change;
- the experiences of other organisations, where feasible.

As change can be almost constant for larger organisations, it is helpful to maintain a register of individuals and their tasks, roles and responsibilities related to the major hazard. This eases assessment of the frequent changes (large and small) that bigger organisations experience, rather than starting the process 'from scratch' with each change. This is a legal requirement for nuclear licensees.

All stages of the process should be adequately recorded, including all relevant factors, questions, assessments, responses, decisions and reasons for decisions. This has a number of benefits:

- transparency;
- easier to audit and assess under quality assurance;
- accountability of decisions and their authorisation can be traced.

A clear implementation plan, such as a project plan, must be produced and approved at a senior level of management. This should be reviewed on a regular basis. Avoid trying to do too much too quickly.

Participationandcommunication

The process of organisational change should involve all those concerned from an early stage. This is not only for industrial relations reasons, staff at all levels will have unique knowledge of what their own work involves and how it is really done; this may include contractor and agency staff. This knowledge is often crucial and must be given proper consideration. This is sometimes difficult given the emotions and agendas involved. Those making decisions should be careful to analyse all information and views carefully, and be made aware of their own potential lack of objectivity through an independent challenge process (see below).

Involvement in this context means active participation in decisions, not just passive consultation. The HSE publication Involving employees in health and safety gives examples of active involvement. Wide participation can also help to ensure a higher level of acceptance of the changes.

Reviewandchallenge

Senior management need to be given adequate information to review progress regularly. The organisation should be prepared to change plans if risk assessment shows a potential risk. Preparation of contingency plans can be helpful, HSE requires contingency planning by nuclear licensees.

It can often be very difficult to be objective during organisational change. This might be because of enthusiasm for a particular plan, pressures from a parent company, budgetary pressure, or simply the stress of high workload and uncertainty. Reviews of plans and assessments by independent internal or external experts should be used to reduce such problems.

STEP 2: RISK ASSESSMENT

The key aim of risk assessment is to ensure that following the change, the organisation will have the resources (human, time, information etc), competence and motivation to ensure safety without making unrealistic expectations of people.

Two aspects of the change need risk assessment, they are related but different and should not be confused:

- risks and opportunities resulting from the change (where you want to get to);
- risks arising from the process of change (how you get there).

The first aspect is dealt with in this section, the second is dealt with in Step 3.

The risk assessment needs to consider potential impacts upon safe operation in the full range of foreseeable conditions and scenarios, as well as:

- all activities required to maintain plant in a safe condition;
- all activities required for a fully functioning health, safety and environmental management system, including all aspects required for major accident prevention or 'process safety' (such as safe design and plant inspections); and
- effective emergency response.

Assessmentprocedures

There are two complementary approaches to ensure that the main risks are identified:

- **mapping of tasks and individuals** from the old to the new organisation;
- **scenario assessments** when the reorganisation impacts staff who may have a role in handling or responding to crises such as upsets and emergencies.

In both cases it is important that organisations use all of the knowledge and expertise available to them and involve the workforce in the risk assessment process.

Mapping

Mapping is the painstaking process of understanding and tracking the detail of the change. It involves:
- **identifying all people** in the existing and proposed organisations who will be affected by the change. It is important that this data is accurate and complete eg maintain a register of all staff in the organisation with relevant roles.
- **identify the tasks** each person carries out, including non-production tasks such as: communication or paperwork; relevant roles and responsibilities they have, including those that are not their mainstream daily duties such as roles in emergency response; and the competences required (special knowledge or skill that each task or responsibility requires); and the working time required for the tasks.
- **Compare the information** carefully checking:
  - whether any tasks or responsibilities have been overlooked;
  - what training will be required, especially in relation to health, safety and the environment;
  - what the total accumulated workload is likely to be for individuals;
  - whether there are tasks that may need to be done simultaneously;
  - what other risks there might be from the changes.

This process becomes more complex in larger organisations where there may be simultaneous changes that may interact with each other, eg roles or responsibilities passing from one area to another. A specific person or body (such as a 'management of change project board') can be allocated responsibility to ensure that these cross-organisation issues are tracked and co-ordinated.

Scenario assessments

These are realistic, structured appraisals that the proposed new arrangements will perform adequately in a range of foreseeable upsets, incidents and emergencies. HSE Contract Research Report *Assessing the safety of staffing arrangements for process operations in the chemical and allied industries*[2] contains an example which assesses staffing arrangement at chemical sites.

An alternative is to carry out exercises and human reliability assessments of how the scenarios would be handled by people (see Human reliability and competence).

Scenario assessments will often be appropriate in addition to mapping, especially for large or complex changes.

Factors to consider

During the assessment consider the following factors:

- **Past experience** eg previous accidents and incidents, maintenance records, or hours worked to see whether there had been any stress points in the existing organisation.
- **Risks from using contractors** eg in high hazard industries, your policy for using contractors or outsourcing needs to be clear and major accident prevention is paramount.
  If you contract out safety-critical work:
  - retain adequate resources to closely supervise and monitor the expertise of people employed, and the quality and safety of their work;
  - remain an 'intelligent customer', in other words retain adequate technical competence to judge whether, and ensure that, work done is of the required quality and safety; and
  - have contingency plans to maintain low risks (and not increase risks) should the contractor lose the capacity or willingness to deliver to requirements.
- **Assessing workload,** especially individual workloads in the new organisation. Take into account all required tasks, peaks and troughs. Overloading can lead to:
  - Omission or poor execution of safety-related tasks such as plant checks or shift hand-overs.
  - Fatigue from working excess hours, leading to reduced reliability, errors, or short cuts.
  - 'Bunching' of tasks preventing quick response or adequate execution.

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- **Action tracking,** all information should be collated and made available to senior management on progress with all actions identified by risk assessments and reviewed as required before the change is completed. This should ensure that all necessary arrangements for safety are in place before key changes, and that nothing is overlooked.
- **Human reliability and competence**, human factors are generally less well understood than engineering risks, the risk assessment should consider potential human failures (see *Reducing error and influencing behaviour*[4]). In high hazard environments, you need to consider or seek advice from human factors specialists.

One of the most critical tasks to face is assurance of the competence of people with changed or additional roles. Many businesses underestimate the temporarily increased workload that this can generate.

Where multi-skilling is planned, there should be careful consideration of how adequate depth of competence will be achieved and maintained where application of new skills may not be frequent, for further guidance see the publication *Multi-skilling in the petroleum industry.*[5]

One danger that is easy to overlook is the loss to the business of informal knowledge and processes. At most sites there will be important knowledge, skills, relationships and activities that are not recorded and which can be lost unless specific effort is made to capture them through discussion with the people involved, eg during their participation in the mapping process.

Remember that competence issues do not only apply to operators. The business needs to have a clear idea of the core level of technical competence it requires among engineers and scientists to ensure that it continues to be in control of its hazards and technology.

Performance indicators

The risk assessments should result in action plans, milestones and identify key performance indicators that can be used to monitor the impact of the change process on the management of major hazards. This is particularly important where consequences could be subtle or long term, such as reducing maintenance staff. The actual measures chosen should be specific to the change and the potential risks identified by the assessments, and wherever possible should be 'lead' indicators measuring the control of risks rather than 'lag' indicators of the realisation of risk. Examples include levels of overtime, maintenance backlogs, or quality of maintenance.

Measurement should begin before implementation, so that there is meaningful data comparison.

Having completed the risk assessment, you will have identified whether there will be increased risks following the planned change that require actions, eg compensatory changes to plant or processes, such as increased automation, or even reappraisal of the plan itself. It is now important to ensure that the actions identified are planned and carried out successfully during the transition and there must be a clear project plan.

STEP 3: IMPLEMENTING AND MONITORING

Safety during the transition

Step 2 was about looking ahead to the proposed change and anticipating risks arising from it. Step 3 concerns management of the transition itself. It is important that plans are carefully reviewed to ensure that exposure to risks is not significantly increased during this time. Even where a planned change involves reducing the workforce, you will usually need to plan for an increase in workload during the transition. You should:

● Phase changes wherever possible, to prevent loss of control through over-complexity and avoid peaks in workload.
● Ensure that there is adequate cover to allow necessary extra work such as training and writing new procedures.
● Arrange for ample support and/or supervision by competent people for all people with new safety-sensitive work.

You must ensure that the change is not hurried through before all necessary new measures are in place and functioning. This means setting clear criteria by which to judge that risks will be as low as is reasonably practicable to complete each change.

Transition checklist

X   Don't underestimate training burden, and required cover.

X   Don't reduce staff or reorganise before required actions are completed.

✓   Do provide experienced support /supervision for staff with new or changed roles.

You should have, at an early stage of your change process, decided on the end point of the process. This should be reviewed regularly and progress towards this aim noted. There may be some actions that remain long term, this should be clear to all involved when the new organisation exists.

There are risks during the change that uncertainty and the effect it has on individuals may affect their

performance. It is outside the scope of this guidance to discuss the management of stress, for guidance on this see *Tackling work-related stress*.[6] However, most responsible companies will seek to reduce periods of uncertainty to a minimum.

Monitoring the change

There will always be a degree of uncertainty as to the impact of organisational change. Effects can be subtle and not immediately apparent, eg degradation of activities following increased workload or span of work, or changed priorities. Unrecorded or informal activities or communications that contribute to safety performance can be overlooked and lost.

Risk assessments and plans for both the transition and progress should be regularly reviewed. You will have set objectives and devised key performance indicators. Periodic, planned reviews should assess whether these have been achieved. Be ready ultimately to change or even reverse decisions where there is evidence that there may be significant risk, however uncomfortable this might be.

It is important to plan-in reviews as the effects of change can be subtle or delayed eg six months to a year afterwards. These reviews should be led by the senior manager responsible for championing the change but may also involve independent reviewers. It is important that the lessons learnt from the change process are identified (strengths and weaknesses) and used to amend the organisation's own change procedure.

Organisations that maintain a register of people involved in managing the major hazard will need to review this periodically to ensure that it is up to date and complete.

LEGAL REQUIREMENTS

All UK businesses have general legal duties for the protection of employees and others. These include requirements under the Health and Safety at Work etc Act 1974 for employers to ensure, so far as is reasonably practicable, the health and safety of employees and others, and the Management of Health and Safety at Work Regulations 1999 which require employers to assess risks concerned.

For major hazards, there are also important sector-specific requirements, as follows.

Offshore installations

For organisations operating offshore installations, relevant regulations include:

- Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995;
- Offshore Installations (Safety Case) Regulations 1992 (SCR);
- Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995 (PFEER);
- Offshore Installations and Wells (Design and Construction etc) Regulations 1996 (DCR).

Duty holders must particularly consider whether, and how, organisational changes may impact on their safety management systems set out in their SCR safety case. Examples of more specific considerations include: arrangements for ensuring safe plant design under SCR and DCR; and effective emergency response under PFEER.

Nuclear licensees

Nuclear licensees may be required to go through a process that is more rigorous than described here, further information on this should be sought from HSE's Nuclear Installations Directorate.

Operators of nuclear installations must hold a licence granted by HSE under the Nuclear Installations Act, 1965. Licences have safety conditions attached, and breach of a licence condition (LC) is an offence.

Of particular relevance to this guidance is LC 36. This requires licensees to "... make and implement adequate arrangements to control any change to its organisational structure or resources which may affect safety." It also requires that, before implementation, the most significant changes must be submitted to HSE for agreement, with an adequately documented demonstration that risks will continue to be properly controlled, both during and after the proposed change.

COMAH sites

Onshore major hazard sites in the UK (not including nuclear and rail) come within the scope of the Control of Major Accident Hazards (COMAH) Regulations 1999, enforced by a joint Competent Authority (CA) comprising HSE and the Environment Agency (EA) and the Scottish Environmental Protection Agency (SEPA). These Regulations require the operators to: take 'all measures necessary' to prevent and mitigate effects of major accidents to people and the environment; and to implement a major accident prevention policy including appropriate procedures and management systems. The CA can prohibit major hazard activities where they have concluded that there are serious deficiencies in these measures.

'Top tier' COMAH establishments also have to submit a safety report to the CA for assessment which must be reviewed and if necessary revised whenever changes are made to the organisation that could significantly impact on the control of major accidents. Safety reports are assessed against criteria set out in the *Safety report assessment manual* (SRAM).[7]

Railways

Railway infrastructure controllers, station and train operators are subject to the requirements of the Railways (Safety Case) Regulations 2000. The safety case must demonstrate that the management system of the duty holder is adequate, and shall be revised "whenever it is appropriate" and "whenever required to do so by the Executive". HSE offers guidance[8] that the safety case should be revised whenever "new activities or equipment or organisational changes are to be introduced". The changes must be accepted by the HSE. Therefore duty holders must have a sound process for the management of organisational change.

Further advice

For site-specific advice on particular changes, or concerning legal compliance, advice should be sought, as stated above, from the HSE, EA or SEPA inspector for your site.

For general advice on the matters set out in this guidance, contact Peter Mullins in HSE's HID Human Factors Team, Tel: 0151 951 3955 e-mail: peter.mullins@hse.gsi.gov.uk

References

1   *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, Castleford on 21 September 1992* Report HSE Books 1994 ISBN 0 7176 0702 X

2   *Involving employees in health and safety: Forming partnerships in the chemical industry* HSG217 HSE Books 2001 ISBN 0 7176 2053 0

3   *Assessing the safety of staffing arrangements for process operations in the chemical and allied industries* CRR348 HSE Books 2001 ISBN 0 7176 2044 1 available online at www.hse.gov.uk/research/crr_htm/325-349.htm

4   *Reducing error and influencing behaviour* HSG48 (Second edition) HSE Books 1999 ISBN 0 7176 2452 8

5   *Multi-skilling in the petroleum industry* (Second edition) Guidance HSE Books 1998 ISBN 0 7176 1582 0

6   *Tackling work-related stress: A managers' guide to improving and maintaining employee health and well-being* HSG218 HSE Books 2001 ISBN 0 7176 2050 6

7   *Safety report assessment manual* available on HSE's website at www.hse.gov.uk

8   *Railways (Safety Case) Regulations 2000 including 2001 and 2003 amendments* L52 HSE Books 2003 ISBN 0 7176 2186 3

Further information

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.