

Safety first when reorganising

Mark Scanlon, *EI Technical Manager–Safety*, reviews the safety risks associated with organisational change and outlines some resources designed to help industry better manage such change.

The pace of change for most organisations seems greater than ever, with no sign of let-up. This is inevitable in a world of pressures on businesses. For those involved, organisational change can be threatening and highly stressful, but for many it can also be an exciting, even exhilarating, opportunity to shape and improve working lives.

This applies as much to safety management as to any other aspect of business. Organisational change can be a chance to make big improvements. For example, it can allow a clarification of personal responsibilities at all levels and help empower people – give them greater means to identify and tackle safety, health and environmental (SHE) issues that affect them – or just help rejuvenate the SHE programme.

But there are risks too. For example, organisational changes were among the root causes in the Longford incident,¹ which resulted in two fatalities and caused major business interruption in Australia, and the fire at Hickson and Welch in Yorkshire (see **Box 1**).

The pressure and emotion that surround organisational change inevitably influences the way that decisions are made and, as the pace of change continues, many organisations have cut staff so far that they now appear to be beyond lean.

What are the concerns?

Over the past few years, organisational change has been top of HSE inspector

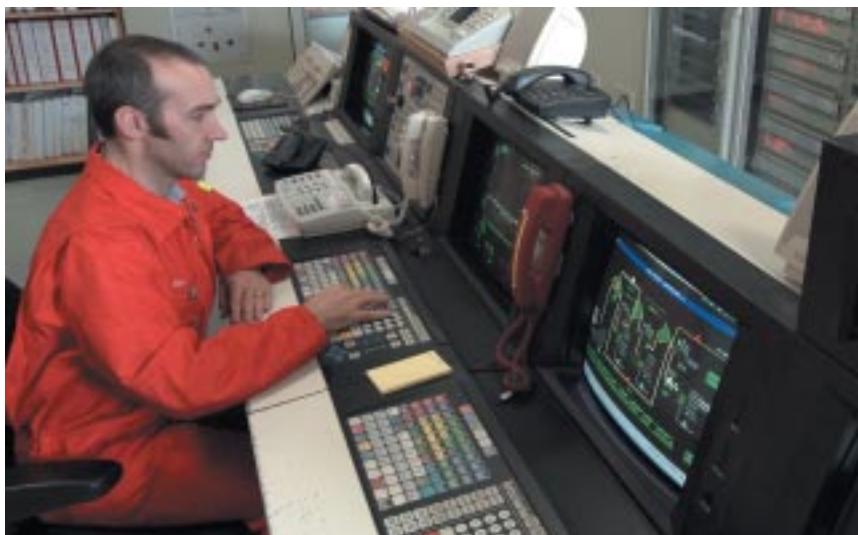


Photo: ChevronTexaco Upstream Europe

Captain control room

requests for support from the HSE Hazardous Installations Directorate Human Factors and Safety Management Team. Inspectors were picking up concerns from employees and safety representatives about changes, often involving de-manning and/or relocation of functions, and they were often uncomfortable about them. In addition, inspectors found the topic difficult to regulate positively, because they lacked benchmarks against which they could assess companies' management of change process.

The same lack of benchmarks also created difficulties for the companies themselves, as there were no tried-and-tested approaches to these risk assessments, or even clear ideas about what risks they should be looking for. While some companies made a good effort to assess the risks – for example, by using

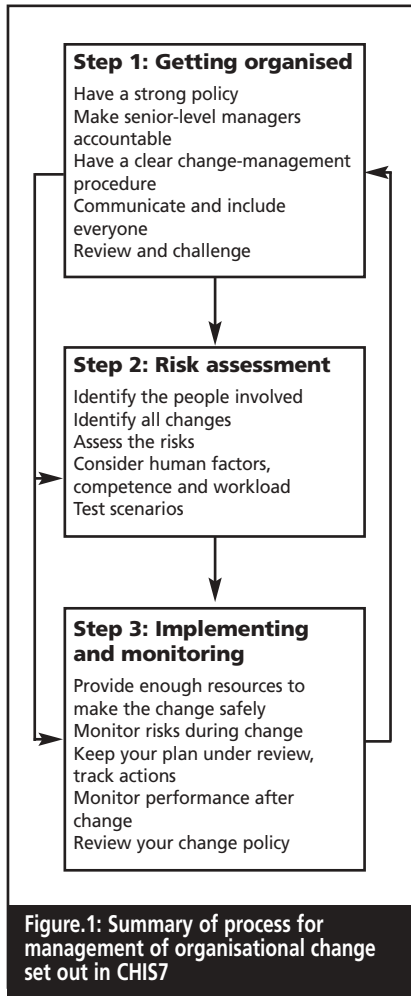
detailed procedures in which forms were completed and approved by senior managers – such risk assessments were basically *ad hoc*. Add to this the difficulty that any of us have with being objective under pressure, and you have a recipe for some unsound decisions.

To illustrate HSE concerns, a case study involving poor management of organisational change by a company that is generally considered to be a high performer in safety is summarised in **Box 2**. In other cases, the impact of changes was more indirect and subtle, resulting in gradual accumulations of maintenance backlogs, operators carrying out new roles but without the necessary training or with unhelpful changes in management priority. Key lessons learned from case studies are given in **Box 3**. In addition, some self-assessment questions that can help determine whether there are

Box 1: Case study – Hickson and Welch (Castleford, Yorkshire)

In 1992, fires at Hickson and Welch resulted in five fatalities 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.

The Health and Safety Executive (HSE) incident report² stated: '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.'



problems arising from organisational change are given in **Box 4**.

Coherent resources

Clearly, these issues pointed to a need to develop coherent resources for managing safety in organisational changes.

The resources are:

- CRR348/2001 methodology³
- CHIS7⁴
- Staffing arrangements user guide⁵

They were written primarily for businesses with 'major hazards', which includes many onshore and offshore petroleum installations. These have the potential for high-consequence incidents and need to make a continuing demonstration of safe operation under the Control of major accident hazards regulations (COMAH) 1999⁶ or similar regulatory frameworks.

Using the resources provides a means to consider safety implications when planning and carrying out organisational changes and to have a structured and effective process for ensuring that staffing arrangements are adequate for abnormal or emergency situations, as well as for steady state operations.

Box 2: Demanning case study

This concerned a simple demanning at a large site. Employee disquiet was loudest at one particular plant where, to enable a reduction in control room staff, a new 'crash' emergency shut-down (ESD) procedure was introduced that would bring the process to a sudden safe state. This new procedure was quite possible to do, but operators were all well aware that the cost in lost catalyst alone would be over £1.5mn on each occasion. Most were hesitant, at best, to take on that responsibility. As prompt ESD could no longer be relied upon under these circumstances, HSE prohibited demanning.

Box 3: Key lessons learned from organisational change case studies

- Human factors, particularly human reliability, need to be understood and tackled with as much rigour as engineering approaches to improving safety. For example, simply instructing people to do something does not mean that it will happen.
- In commercial enterprises, managers take calculated business risks to remain competitive. However, those managing major hazards must be particularly diligent in preventing major accidents.
- At times of change, almost no-one directly involved can truly be objective. Therefore, an independent individual should be involved in reviewing, or better still chairing, risk assessments – especially when discussing key safety-critical or safety-related functions.

Box 4: Self-assessment questions to determine whether there are problems arising from organisational change

- Are there enough people to carry out everyday work, and respond to any unusual or emergency situations?
- When employees' jobs are changed, do they get proper training in the new jobs?
- Are there enough people available to supervise all of the contractors working on site?
- Does management explain the need for change and consult or involve employees in the change process?
- Do systems that worked before the change still work as well as they did afterwards (for example, supervision or permit-to-work systems)?

These self-assessment questions are drawn from IP Human factors briefing notes resource pack, No. 3 Organisational change. See *Energy Institute website* www.energyinst.org.uk/humanfactors.bn

CRR348/2001 methodology

HSE commissioned Entec to develop a methodology for assessing staffing arrangements in process operations, in particular, control rooms. This is published as HSE *Assessing the safety of staffing arrangements for process operations in the chemical and allied industries* ('CRR348/2001 methodology'³). Industry was formally consulted during its development through a workshop.

The CRR348/2001 methodology is based on making a 'physical assessment' of performance in a range of scenarios and a 'ladder assessment' of management and cultural attributes underlying the control of operations. Using the CRR348/2001 methodology should allow companies to identify areas of unacceptable risk and the necessary improvements to reach acceptable levels with issues such as communication facilities, operator workload, management of operating procedures, etc. The improvements could include

changing staff numbers or supervisory arrangements, but could also be brought about by improving hardware or software for detection, alarm or trip systems.

The CRR348/2001 methodology has proved very successful, and its uptake spread quickly across the petroleum, petrochemical and chemical industries. However, because its scope was limited, and because it suits some circumstances more than others, it was not the answer to organisational changes – there was need for broader guidance.

CHIS7

HSE therefore developed the concise, Internet-only publication *Organisational change and major accident hazards* ('CHIS7')⁴. This captures ideas from the CRR348/2001 methodology and lessons from pitfalls observed in inspections, such as lack of understanding of human factors, bias, marginalisation of safety in change management etc. This resulted in a three-

Box 5: Staffing arrangements toolbox

□ The staffing arrangements toolbox provides those in the petroleum and allied major hazard industries with the resources necessary to better determine staffing arrangements in control rooms and similar locations. The toolbox brings together guidance, research, case studies and useful links. It comprises:

- The Staffing arrangements user guide
- The blank staffing assessment forms and checklist (as downloadable Word documents) that form Annexes D and F of the Staffing arrangements user guide
- A web link to the CRR348/2001 methodology report
- Courtesy of HSE, the blank physical assessment decision trees and ladders (as downloadable Word documents) from the CRR348/2001 methodology report
- Two case studies from the series of *IP Human factors safety information bulletins* that concern reviews of staffing arrangements in the context of broader organisational changes
- The IP Human factors briefing note on *Organisational change*
- A web link to further references on organisational change and staffing arrangements
- A web link to CHIS7
- A web link to HSE Research Report (RR292) *Different types of supervision and the impact on safety in the chemical and allied industries*

See Energy Institute website www.energyinst.org.uk/humanfactors/staffing

Box 6: Case study – Associated Ocel (Ellesmere Port, Cheshire)

Associated Ocel recognised that proposed major organisational changes to the staffing of its chlorine plant could jeopardise safety if not adequately assessed. The company applied the CRR348/2001 methodology to flush out areas of concern and develop pragmatic solutions. The approach enhanced a team culture and allowed operators to contribute to the development of their working environment. It also allowed management to determine what could be managed by changes to operational practices, or improved process control systems, and also to identify what changes were 'a change too far'.

For further information, see IP Human factors safety information bulletins, No. 3 Assessing staffing requirements for hazardous situations. See Energy Institute website www.energyinst.org.uk/humanfactors/sib

step safety management process that forms the core of CHIS7 (see **Figure 1**).

The guidance focuses on organisational change at operational and site level, but is also relevant to changes at corporate level, which, in turn, can have a significant impact on safety at operational level.

HSE trialled and refined CHIS7 by using it as *de facto* guidance in inspections for almost two years, and the processes described there were put into practice by many petroleum, petrochemical and chemical businesses. The guidance was also modified such that it placed less emphasis on one-off big changes, but more on permanent arrangements for management of continuous change. Industry was formally consulted on it through the Chemical and Downstream Oil Industries Forum and the Oil Industry Advisory Committee.

Staffing arrangements user guide

In response to feedback solicited by the Energy Institute requesting clearer guidance on using the CRR348/2001 methodology, the Energy Institute Human

Factors Working Group, using Technical Partner funding and HSE co-funding, commissioned Entec to develop the Staffing arrangements user guide. This does not duplicate the CRR348/2001 methodology report but sets out a best practice approach to it. As a result, the two documents should be read alongside each other. In addition, the Staffing arrangements user guide includes supplementary guidance on how best to apply the CRR348/2001 methodology to automated plant and/or equipment.

Following consultation with the petroleum and allied major hazard industries, the Staffing arrangements user guide was published by the Energy Institute as *IP Safe staffing arrangements – user guide for CRR348/2001 methodology: Practical application of Entec/HSE process operations staffing assessment methodology and its extension to automated plant and/or equipment*.⁵ Single users can download it from the Staffing arrangements toolbox (see **Box 5**).

What next?

Companies that have used the resources in their organisational changes are not

leading to the kinds of unsafe conditions described earlier in this article. Some have been particularly successful (see **Box 6**).

Even if your organisation is not currently undergoing change, it soon could be! So it is not too early to have a look at CHIS7 in the first instance and start to design your own process. Those considering organisational changes should talk them through with their usual HSE contact. ●

References

- 1 Hopkins, A, *Lessons from Longford: The Esso gas plant explosion*, CCH Australia Ltd, Sydney, 2000, ISBN 1 86468 422 4.
- 2 *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*, HSE Books, 1994, ISBN 0 7176 0702 X.
- 3 *Assessing the safety of staffing arrangements for process operations in the chemical and allied industries*, HSE Books, CRR 348/2001, 2001, ISBN 0 7176 2044 1. See HSE website www.hse.gov.uk/research/crr_pdf/2001/crr01348.pdf
- 4 *Organisational change and major accident hazards*, HSE, CHIS 7, 2003. See HSE website www.hse.gov.uk/pubns/chis7.pdf
- 5 *Safe staffing arrangements – user guide for CRR348/2001 methodology: Practical application of Entec/HSE process operations staffing assessment methodology and its extension to automated plant and/or equipment*, Energy Institute, 2004, ISBN 0 85293 411 4. See EI website www.energyinst.org.uk/humanfactors/staffing
- 6 *Control of major accident hazards regulations 1999*, HMSO, SI1999/743.

Find out more

To assist the industry in better understanding the safety implications of organisational change and staffing arrangements, the Energy Institute Human Factors Working Group is convening a seminar entitled 'Workload, organisational change and stress – practical application of human factors tools to major hazard operations' on Tuesday 26 April (in London). This will feature presenters from industry, HSE and consultancies, and will be used to launch the Staffing arrangements user guide.

For further information, contact Arabella Dick, t: +44 (0)20 7467 7106, e: arabella@energyinst.org.uk or see the Events calendar on the EI website at www.energyinst.org.uk