

ESSO AUSTRALIA'S APPROACH TO SAFETY MANAGEMENT

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ABSTRACT

Esso Australia Ltd.'s current company-wide safety initiatives are aimed at challenging all employees and contractors to think about steps they can take to help move towards an injury-free workplace.

The development and practical application of a number of occupational safety initiatives have contributed towards Esso employees achieving a period approaching 13 million workhours (nearly five years) without a Lost Time Injury (LTI) and which also assisted Esso's contractor workforce to achieve a period of more than 3 million work hours LTI free while performing exploration, heavy construction, drilling, production and maintenance operations.

Esso produces 32 million litres of crude oil per day and up to 25 million cubic metres of gas per day from 18 Bass Strait platforms, and two onshore oil/gas facilities on behalf of the Esso/BHP Petroleum joint venture (Fig 1). More than 1200 employees and 800-1,000 contractors are involved in operations involving a high level of production drilling and construction activity.

This level of safety performance has been achieved through the unwavering commitment and dedication from all levels in the organisation to create a safety culture which is genuinely accepted by employees and contractors as one of their primary core personal values.

The framework for Esso's safety management is Esso's 'Operations Integrity Management System' (OIMS). This requires that all operations adopt a structured approach to safety management with particular emphasis on risk management including continuously looking for opportunities to improve safety management processes.

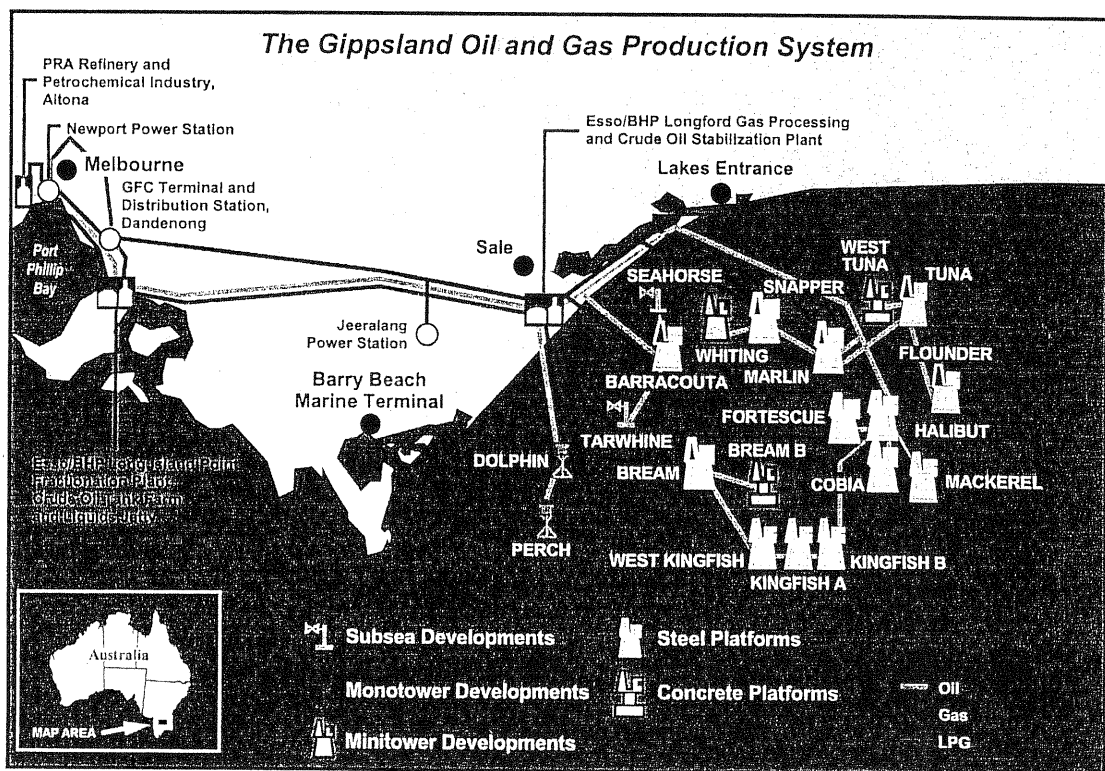


Figure 1. Bass Strait production system.

We have been active in developing and refining innovative personal and work group risk management tools (Stepback 5x5 and Task Analysis). These tools are designed to promote increased levels of shop floor involvement in identifying and addressing safety issues, improving first line supervisor involvement and safety skills, and nurturing a '24-hour' safety culture which extends beyond the workplace into the home and family environment. The combined effect of these initiatives is helping create a mindset that no level of injury (not even first aid) is acceptable regardless of the activity being undertaken. It promotes the expectation that everyone approaches their daily work with the mindset that 'all injuries are preventable!'

INTRODUCTION

Building an effective safety culture requires strong commitment from all levels of the organisation and significant effort over an extended period of time. Early progress on our safety management programs were reported by Borghesi et al (1991) and Pike et al (1994) —see later references. This paper also provides an overview of our safety management systems and processes but primarily focuses on several recent successful safety initiatives including our personal risk assessment tool, Stepback 5x5 and our shop floor employee involvement initiative, Safety Promoters.

COMPANY CORE VALUES

Esso Australia's Mission Statement simply states 'Our mission is to be Australia's most successful petroleum exploration and production company and Exxon's best performing affiliate'. Underpinning this mission are six fundamental core values covering safety, ethics, care for the environment, business excellence, concern for individuals and, teamwork. The safety core value follows:

'The health and safety of every employee, and of our customers and the public, is central to the way we operate. Our goal is to work in such a way that no one is hurt. No task is so important that a way cannot be found to do it safely.'

Not long ago we conducted a survey of our employees to better understand whether these fundamental principles were integrated into the daily activities, thought processes, and decisions made by our employees. We wanted to better understand the company's real culture—the invisible 'rules' on how to behave which have a large effect on how people achieve their business and career goals. The survey showed that employees strongly accept safety as part of their core beliefs and are very proactive in thinking of ways to improve safety.

PERFORMANCE SUMMARY

Employee lost time injuries (LTIs) have fallen from four in 1990, to two in 1991, to zero for nearly five years (12 million work hours+) from 1992 through to August 1996 when an employee LTI was sustained (Fig. 2). Contractor LTI's have also fallen from 20 in 1990, to 15, 9, 2, 3, 1 and 2 in the years 1991 through 1996 (Fig. 2).

The reduction in LTI's has allowed our focus to move to Total Injury¹ performance (Fig. 3). This gives a much better measure of our safety performance than lost time injuries and also provides significantly greater challenge to reduce the level of injury. This is consistent with the expectation that all incidents are preventable and the goal of injury-free operations. We also actively encourage increased levels of near miss and hazards reporting to ensure early identification and action on undesirable trends. Our Safety Promoter initiative described later has been a key factor in helping design improved processes to encourage greater levels of near miss reporting.

Our current safety theme, 'Let's get real! ... all injuries are preventable', was designed to stimulate further discussion and actions directed at achieving a mindset of injury-free operations right throughout our employee and contractor workforce (Fig. 4). This expectation has already been achieved in some areas of our operations including recent examples of significant size turnarounds (three-month duration involving 50+ workers) completed without a single first aid treatment.

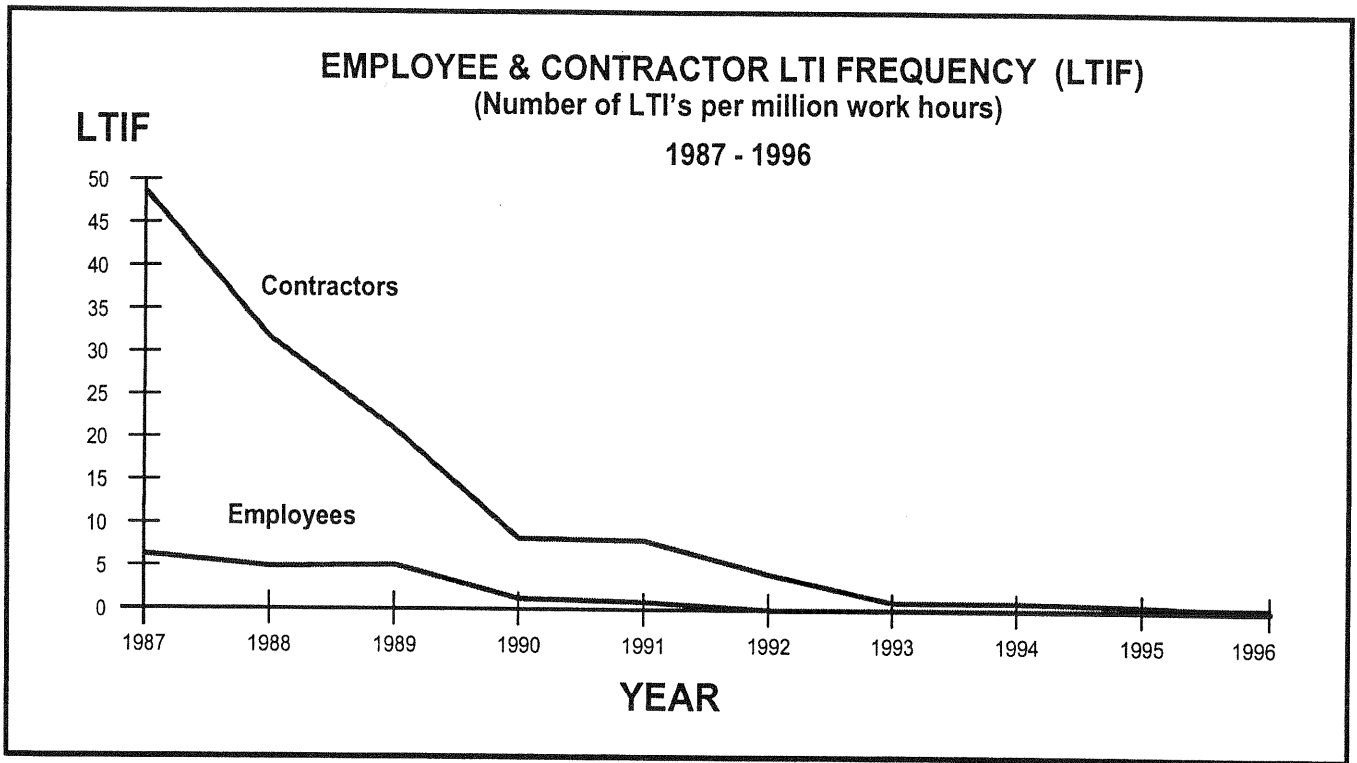


Figure 2. Employee and contractor Lost Time Injury (LTI) performance.

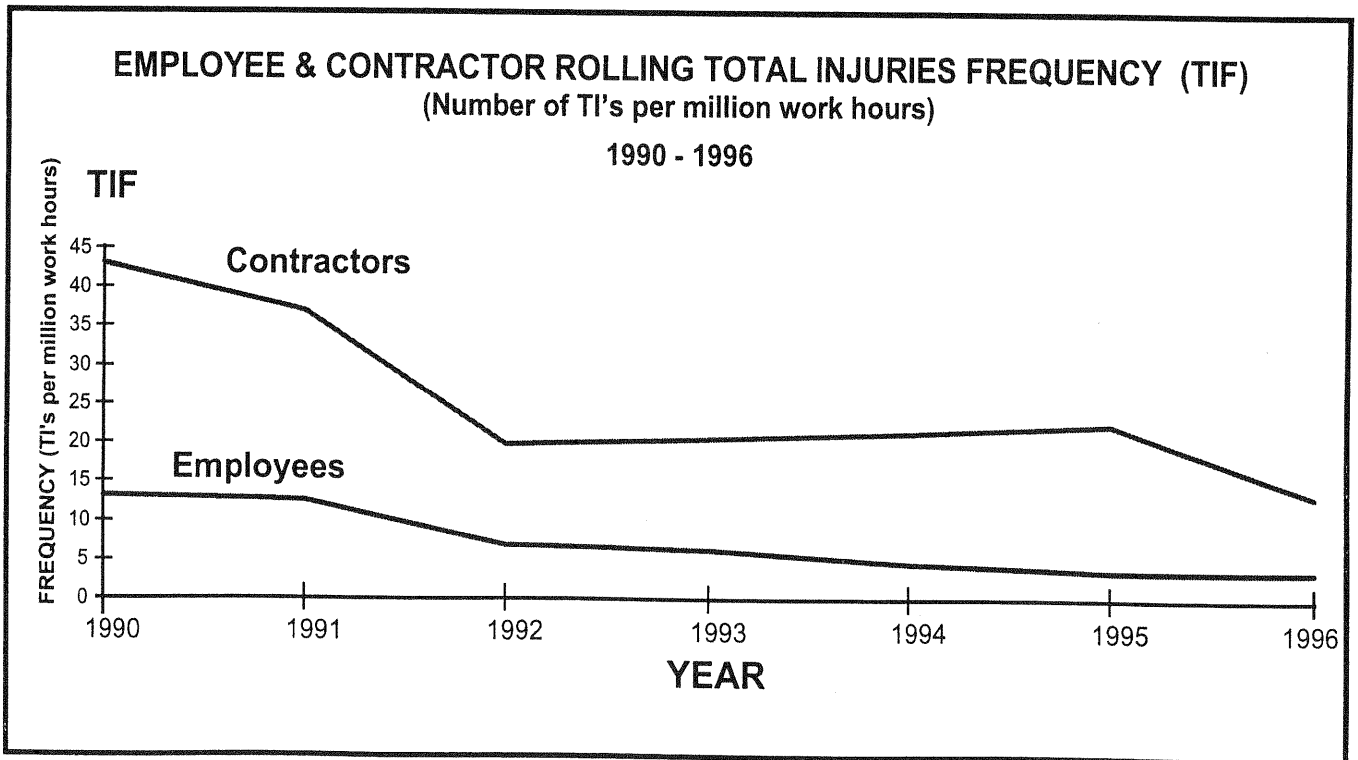


Figure 3. Employee and contractor Total Injury (TI) performance.



Figure 4. Esso's 'Let's get Real!' safety promotional logo.

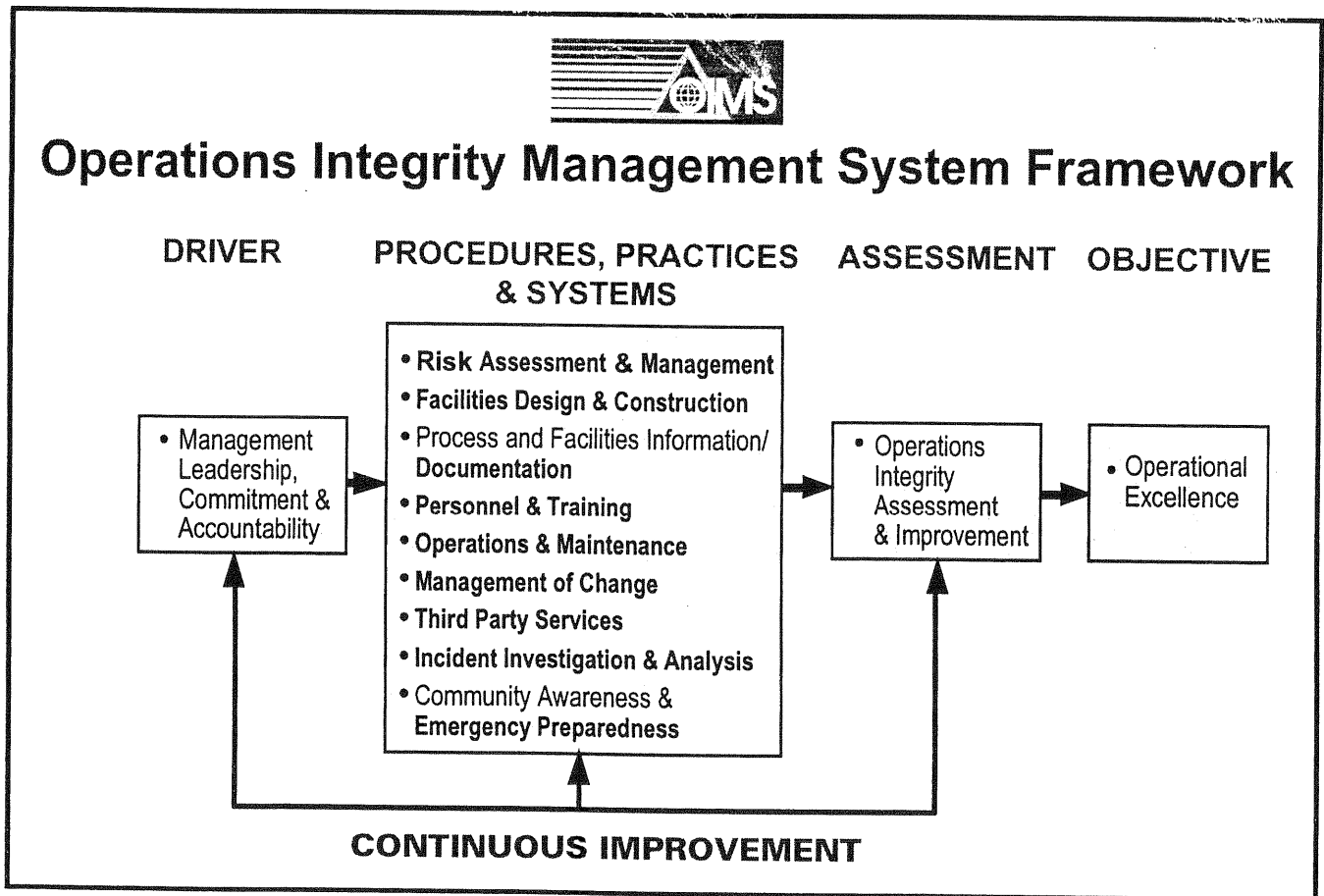


Figure 5. Operations integrity management systems framework.

SAFETY FRAMEWORK

The foundations of our safety management systems are firmly underpinned by Esso's Operations Integrity Management System (OIMS). OIMS was introduced throughout all Esso affiliates at the start of this decade and is now fundamental to effective management of health, safety and environmental issues.

OIMS is a structured framework that assists in lowering the risk of incidents. It builds on the successful health, safety and environmental programs which were already in place. The process is based on 11 elements of a safe and environmentally sound operation (Fig. 5). These are:

- management leadership, commitment, accountability;
- risk assessment and management;
- facilities design and construction;
- information/documentation;
- personnel and training;
- operations and maintenance;
- management of change;
- third party services (i.e. contractors);
- incident investigation and analysis;
- community awareness, emergency preparedness; and,
- operations integrity assessment and improvement.

More specific expectations and guidelines have been developed to enhance and guide the implementation of the 11 elements. However, a key feature of the OIMS is its requirement that systematic processes be adopted with clear scope, written procedures, documented responsibilities and an ongoing verification and measurement process to confirm feedback on performance leads to continuous improvement.

RECENT INITIATIVES

Following is a summary of some recent safety initiatives which have had a positive effect on reducing incidents/injuries.

'Stepback 5x5' and task analysis

Several years ago, despite the significant decrease in lost time injuries, the rate of reduction of minor injuries was relatively flat. To address this we conducted a thorough analysis of all injury incidents to determine root causes and trends. The study also looked at the types of tasks which were being undertaken, where the tasks were performed, which work trades performed the task, work location,

supervision, training, procedures and a number of other factors.

The results of the study assisted in developing safety tools which have been instrumental in helping move towards an injury-free workplace. The study revealed that most (more than 85 per cent) of injuries occurred during routine operations where risks had not been fully recognised or controlled or where communications could have been improved. The vast majority of these tasks did not require a procedure or formal planning. We found that higher-risk tasks were invariably completed without a single injury because of the high level of planning and safety awareness associated with the risks in completing the work. Medium-risk jobs which required a team effort did sometimes result in an injury; however, the likelihood of injuries was significantly reduced due to our requirement for a task analysis (or job safety analysis) to be performed for all medium-risk activities.

The study identified a gap in our hierarchy of risk management tools in the area of personal planning for lower risk tasks (Figs 6, 7). This was the genesis of our Stepback 5x5 tool. The term Stepback 5x5 means to step back five paces (nominally) and invest five minutes (nominally) to think about the job and to identify and control hazards (Fig. 8). It sounds simple but incorporating this philosophy into our work culture is having a very positive influence on reducing injuries.

Rollout of Stepback 5x5 started with clear communication of expectations from managers that using Stepback 5x5 was expected and that supervisors should reinforce this by providing positive recognition to workers practicing this principle. There was also a strong thrust from shop floor personnel to adopt the process because it suited their work patterns.

We then developed a process to verify that Stepback 5x5 was continually reinforced and integrated into work practices. The most effective way of achieving this was to confirm that all workgroup supervisors led an interactive discussion of the tasks for the day and solicited input from work team members about 'things to watch out for'. These meetings only take about 10 minutes but are very powerful in reinforcing the Stepback 5x5 principles and sharing ideas and best practice among work team members. Part of the process also encourages workgroups to meet for 10 minutes at the end of the day to discuss how things went during the day, what unexpected hazards they

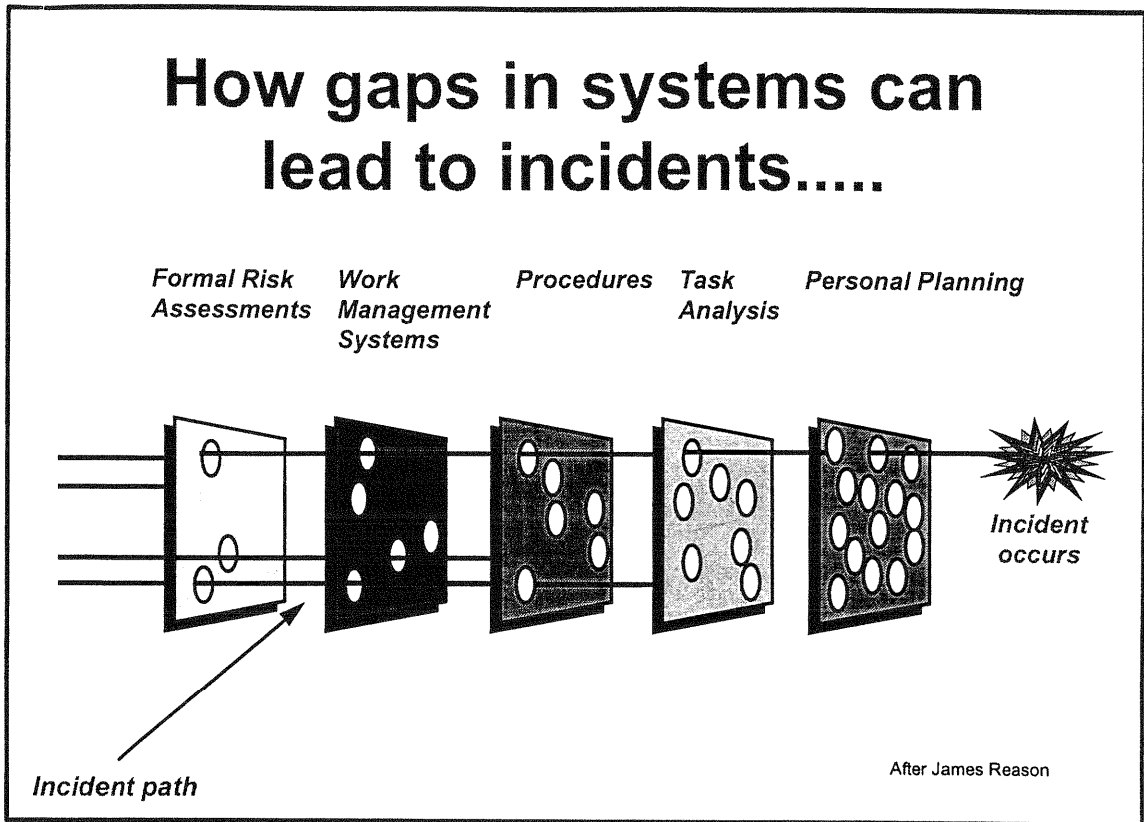


Figure 6. How gaps in risk management systems can lead to an incident.

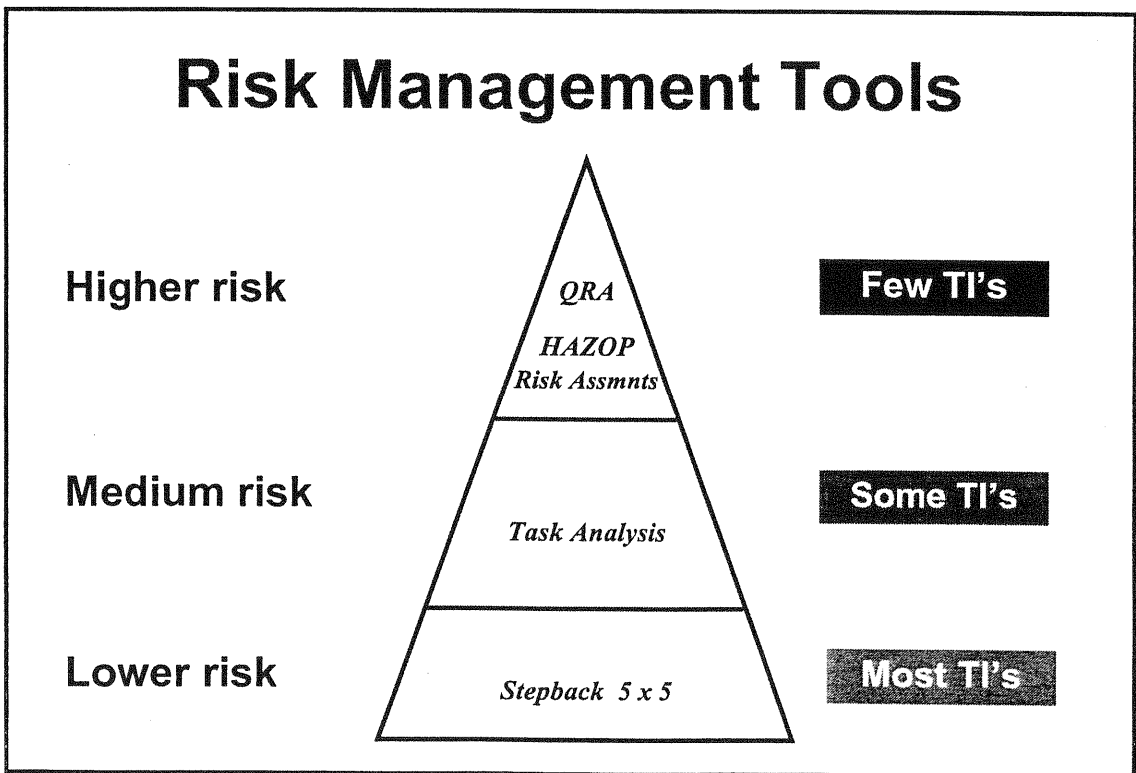


Figure 7. Esso's risk management hierarchy.

encountered and how they overcame them. Apart from focussing the workgroup on hazard identification this process is proving to be an effective tool for identifying opportunities to improve work quality, efficiency and schedule. It also creates regular opportunities for supervisors to provide positive feedback to team members for their contributions.

Since introducing Stepback 5x5 we also identified the need to introduce guidance for supervisors (in the form of a simple flow chart and checklist) to help decide which tasks can be safely performed using Stepback 5x5 and which tasks require a task analysis, a written procedure or a more comprehensive hazard analysis such as a formal risk assessment or a HAZOP².

We have also developed a simple guide phrase booklet based on HAZOP principles which will help work groups undertake higher quality and more thorough written task analysis which considers all relevant hazards. This was prepared in response to the realisation that the quality of task analysis is affected by type and breadth of experience of the team which prepares the task analysis. Our guide words booklet will help bridge this gap.

Safety Promoters

Maximising the involvement of shop floor workers in taking interest and ownership of their local safety plan is a fundamental element of a successful program. Our Safety Promoters initiative is designed to help achieve just that.

Safety Promoters were selected by line supervisors for their interest and enthusiasm regarding safety. They complement the role of the elected Health and Safety Representatives (HSRs) by spending most of their efforts on 'front-end' safety initiatives rather than the 'back end' part of safety management such as incident investigations which the HSRs focus more of their time on. Both roles are important.

Last year about 50 employee and contractor safety promoters were selected. They attended a kickoff workshop which was designed to improve their communications skills, knowledge of safety resources available to them and to help them work through a process to identify which areas of safety they wished to focus on. The promoters developed their own role statement: 'The role of Safety Promoters is to communicate safety information and support supervisors and workgroups to improve safety'.

For 1997 the Safety Promoters determined that their primary objective was to help promote increased levels of near miss incident and hazard reporting. The

Promoters developed a simple report form and a process which will make reporting easier. Esso management have already implemented this process and the use of their form.

Safety Promoters are also proving to be effective in communicating new safety initiatives at a peer-to-peer level and getting buy-in. This complements the communications from manager to supervisor then supervisor to shop floor workers. We are finding that initiatives like increasing the level of near miss reporting, improving hazard identification skills and awareness and sharing lessons learned through off-the-job experience are rapidly gathering momentum. The Safety Promoters initiative is all about trusting and empowering employees to take responsibility for managing the safety issues that effect them. It is rapidly becoming an important element of our safety program, and we plan to continue to nurture and build on this approach in the future.

Safety leaders training

We believe that all individuals in our organisation from executives to workers on the shop floor should be given the opportunity to become 'safety leaders'. With this in mind we developed a 'Safety Leaders' training course. The course is open to all levels of our employee and contractor workforce. We aim to have a mix of Esso and contractor participants from senior management down through first line supervision levels to shop floor workers. The three-day residential course focuses on traditional safety skills such as risk identification, incident investigation techniques including root cause analysis and development of site-specific safety programs. A key feature of the course is the focus on development of interpersonal skills, understanding human behaviour, communication and negotiation skills, and how to set, monitor and achieve realistic and challenging objectives which participants commit to at the completion of the course.

In addition to participants leaving with improved safety leadership skills, a significant side benefit is improved teamwork and communications at all levels of the organisation due to the mix of people attending the course. For example senior managers have the opportunity to discuss safety issues with shop floor workers, our employees get to understand contractor issues, and workers from different sites share best practices, make friends and network to share information and initiatives long after the course is complete.

As part of the follow-up process, the personal objectives set by participants are reviewed several months after the course. Certificates and a memento

are issued following the successful completion of the objectives.

'24 hour' safety

Real commitment to safety can't be 'turned on' at the entrance gate at the start of the day and be left behind at the gate on the way home.

Safety and well-being of fellow employees is extended beyond the workplace at Esso. A true commitment to safe behaviour is developed by promoting safety as a full time (i.e. '24 hour') effort both on and off-the-job (Fig. 9).

We encourage employees to report non-work-related incidents and share lessons learned from off the job incidents and near-misses. We communicate learnings through articles in newsletters or through publication of special '24-hour' alerts. From this information we hold safety meetings and develop flyers aimed at sharing lessons learned and preventing off-the-job incidents.

One of our most successful 24 hour initiatives has been to develop our annual company calendar using sketches with a health, safety or environmental theme drawn by the children of our employees. The number of entries for the annual calendar competition continues to grow along with the standard of entries. The calendar speaks volumes about the high awareness and commitment of the families of our employees regarding health, safety and environmental issues.

Other 24-hour safety initiatives include 'Family Health and Safety Days', home-related safety awards, driver training for spouse and family members and integrating safety considerations into planning of external company functions such as family Christmas parties, etc.

Contractor safety

We require our contractors to develop and implement their own systems, standards and procedures based on the same set of safety expectations which we apply to our employees. Recognising that many of our contractors have safety management systems and processes which are different to Esso's, we communicate safety requirements in the form of expectations written in plain language which cover our OIMS requirements. This allows contractors to satisfy our requirements but within the framework of their own company culture and systems. These expectations cover Management visibility and safety commitment; Involvement of Workers; Safety Management Systems; Standards and Procedures; Self Assessment; Induction and Training; Risk Identification and Control; Incident Management;

Injury Management and Patient After Care; and Continuous Improvement. We also include provisions covering these areas in contracts.

Part of this process is to verify that expectations and feedback of results are discussed at all levels of the Contractor's organisation. This takes the form of one-on-one meetings with Esso and contractor executives all the way down to working level contacts on a daily basis, seminars with our contractors to review safety issues, performance and share best practices. All contractors are also required to commit to an action-oriented safety management plan which is reviewed on a regular basis with Esso management.

Another key feature of our interaction with contractors is to involve them (where appropriate) in working with us to identify ideas for improving our combined safety performance. Our contractors are 'part of the team' and are an important element of our internal processes for sharing best practices between different sites and workgroups. For example, we recently held a series of workshops for all Esso and contractor first line supervisors to clarify management safety expectations; share best practices with regard to workgroup safety initiatives and processes; develop personal safety objectives, and to identify opportunities to improve safety systems and performance. Other examples include contractor participation in site safety committees and attendance at safety training with our employees.

THE FUTURE

Human factors

The concept of 'Human Factors' is generally well understood throughout most of the aviation and nuclear industries. However, there is significant scope for a wider range of industries to improve their safety performance by capturing the benefits of integrating Human Factors into base business.

Esso's definition of Human Factors is 'the integration and application of scientific knowledge about people, facilities and management systems to improve their interactions in the workplace'. Simply put, human factors is the systematic application of our knowledge about how humans interact with the equipment and systems that they use and the environment in which they operate (Fig. 10). Most incidents usually have a significant human factor element associated with the cause which is often expressed as 'human error'. Depending on the industry, and the quality and maturity of safety management systems, human error can account for

What is Stepback 5 x 5?

- A process that identifies hazards before a task is started
- Based on “engaging the mind before the hands”
 - Step back 5 paces from the job
 - Invest 5 minutes to step through the work in your mind
- Group meetings before the commencement of work
 - Share information to determine conflicting work
 - Identify hazards that may be encountered during the work
 - Discuss previous experiences with doing the same work
- Individuals “Stepback 5x5” throughout day’s activities
- Supervisors provide positive reinforcement for Stepback 5x5
- Group meetings at the completion of the day’s work
 - Share learnings from the days events with the workgroup and others where appropriate
- Expectation by management that it be done for ALL tasks!

Figure 8. Summary of Esso’s Stepback 5x5 personal risk management process.



Figure 9. Promoting a ‘full time’ (i.e. 24 hours a day) commitment to health and safety as essential.

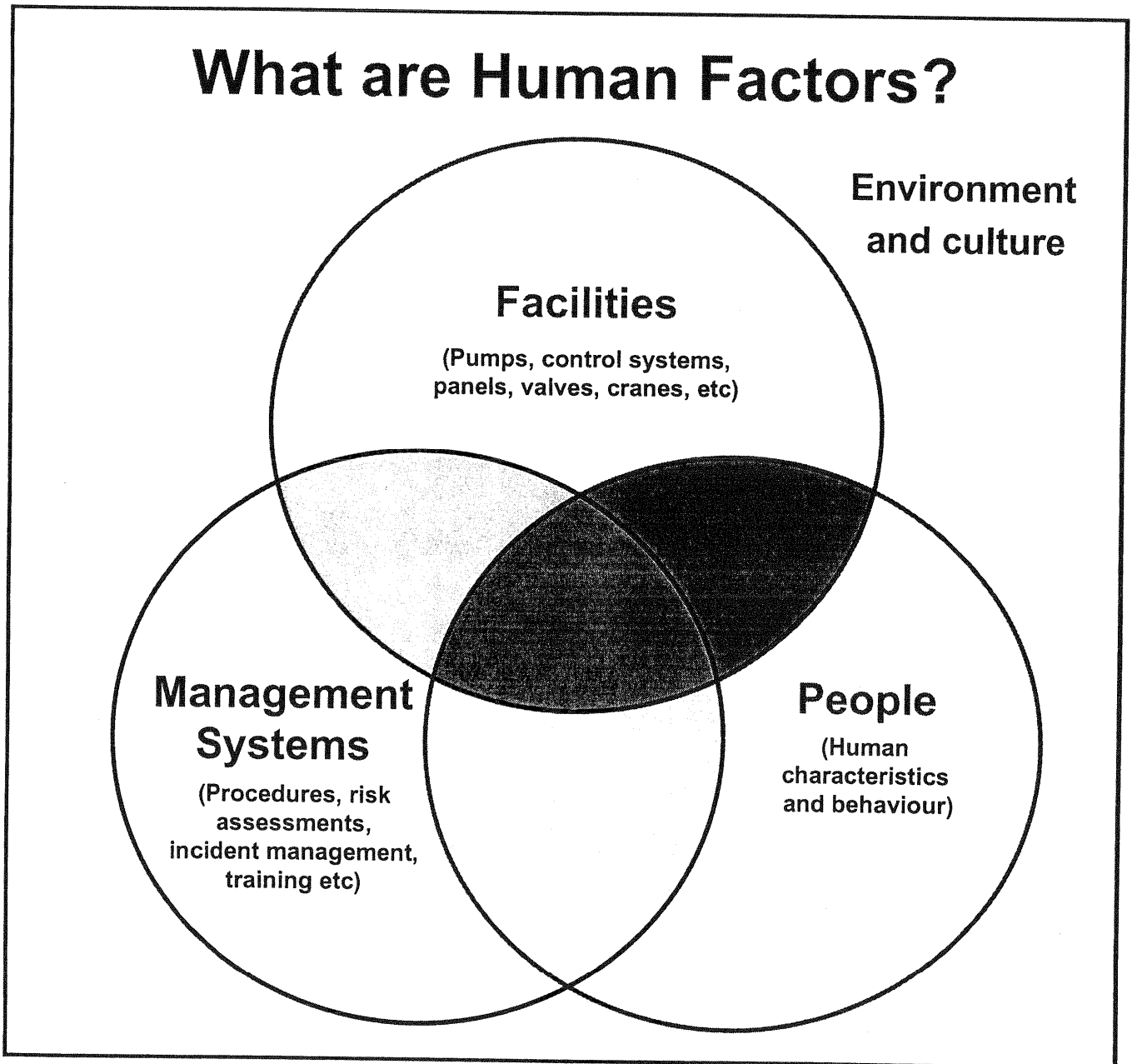


Figure 10. Elements which make up the Human Factors research.

70 per cent to more than 80 per cent+ of incidents. It is not surprising that most companies are interested in studying ways of understanding what causes human errors and developing ways to reduce them.

Esso has been working closely with two of Exxon's key company research organisations, Exxon Production Research Company (EPRCo) and Exxon Biomedical Sciences, to better understand the scientific research in this area and develop practical tools to incorporate Human Factors considerations into existing systems.

Examples of this are the development of a series of Human Factors Guidelines which will help to expand the awareness. These cover the application of human factors considerations in areas such as risk assessment; project scoping; control room design; process control systems; operability and maintainability; plant and pipe labelling; isolation and emergency shutdown; and offshore operations.

We are also participating in a field trial of EPRCo's Human Factors Analysis Software Tool (HFAST) which is designed to be a self-help tool to assist operating sites in identifying and reducing human error potential. This Windows™ based software guides users through a series of questions in 14 key areas of human factors to help identify potential issues where integration of human factors principles would be beneficial. The software also has provision to provide expert self-help information on how to go about addressing issues identified.

Rollout of the guidelines mentioned above has commenced. We also expect to be utilising HFAST in the second half of 1997 to help identify and address human factors issues which have the potential to cause human error.

SUMMARY

Esso's safety performance is built on a firm foundation and systematic approach to all aspects of safety management which are integrated with the base business. Continuously improving safety performance by improving our systems, implementing innovative safety initiatives, and maximising the level of involvement in safety at all levels throughout the organisation is at the core of our approach to safety. Despite our relatively good safety performance, significant efforts are still being directed towards our goal of eliminating all injuries from our workplace.

ACKNOWLEDGEMENTS

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NOTES

Total Injuries include all lost time injuries, medical treatments and restricted work cases.

HAZOP study is a technique developed by ICI in the late 1960's/early 1970's to help identify hazards and operations issues associated with plants. It is based on a multidisciplinary study of the steps in a process using deviations from normal situations utilising a series of guide words.

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