

## LESSONS FROM RE-LICENSING MAJOR HAZARD FACILITIES IN VICTORIA, AUSTRALIA

Geoff Cooke

Hazard Management Division, WorkSafe Victoria

The *Occupational Health and Safety (Major Hazard Facilities) Regulations* came into effect in the State of Victoria, Australia on 1st July 2000. Approximately 40 Major Hazard Facilities (MHFs) were granted a licence to operate for up to 5 years on or before 30th June 2003. The majority of the licences granted were renewed on or before 30th June 2008.

This paper provides an insight into the experience of the Hazard Management Division in the licensing renewal activities for Victorian Major Hazard Facilities. An overview of the work undertaken to develop and implement a licensing renewal process for Major Hazard Facilities is also provided, together with observed changes in safety performance at Major Hazard Facilities, lessons for Operators and Regulators and the proposed next steps in maximising the safety benefits of the Safety Case regime.

**KEYWORDS:** Safety Case, Major Hazards, Licensing, Inspection, Audits, Major Hazard Facilities, Victoria, WorkSafe, Australia

### INTRODUCTION

Major Hazard Facilities (MHFs) are industrial sites that store, handle or process large quantities of hazardous chemicals and dangerous goods, including petroleum products. Examples include: oil refineries, explosives, chemical manufacturing, gas-processing plants, LPG facilities, some warehouses and transport depots.

Victoria has approximately 40 of these sites which must comply with stringent regulatory requirements, including the preparation of a Safety Case to ensure that they are operated safely. The Safety Case and licensing requirements came into effect in the State of Victoria, Australia on 1st July 2000 and these additional requirements are included in Part 5 of the Victorian Occupational Health and Safety Regulations 2007 (the regulations) (Victorian Government, 2007).

The regulations require the Major Hazard Facility (MHF) to be licensed to operate and the licence must be renewed at least every five years. To renew the licence the Operator of a MHF must submit an application and a reviewed and revised Safety Case to the Victorian Health and Safety Regulator (WorkSafe) setting out how the facility will operate safely and demonstrate that the stringent requirements of the regulations are met. This results in a cyclic process involving regulatory driven activity transitions from licensing, inspection and Safety Case review and revision. Typically the cyclic regulatory driven activities include initial licensing, post licensing inspection, review and revision of the Safety Case and re-licensing the facility, as illustrated by Figure 1.

WorkSafe's experience and observation from licensing and inspection are discussed elsewhere (Cooke 2003 and 2004). This paper discusses the experience and observations from the re-licensing activities that took place during 2007 and 2008.

### DEVELOPMENT AND IMPLEMENTATION OF THE LICENSING RENEWAL PROCESS FOR MAJOR HAZARD FACILITIES

Approximately 40 MHFs were granted a licence to operate for up to 5 years on or before 30th June 2003. The majority of the licences granted were renewed on or before 30th June 2008. In order to manage this peak in regulatory activity, WorkSafe produced a guidance note (WorkSafe, 2006) to assist with this re-licensing process. The process was not mandatory; however, all Operators chose to follow it.

The non-mandatory MHF re-licensing process is illustrated in Figure 2 and includes the following features:

- Approximately 18 months before the licence expired, WorkSafe issued the MHF Operator with an Oversight History Report for their facility. A copy was also sent to the company's most senior person residing in Victoria. This report provided a summary of information and any perceived deficiencies based on WorkSafe's interaction with the facility over the period of the current licence. Typically, examples of the deficiencies included inconsistencies in operation of the safety management system, an unusual incident history or unexplained poor performance of risk control measures. Importantly, the report also identified whether there were any issues that WorkSafe considers may have a significant bearing on renewal of the licence if not properly addressed in the reviewed and revised Safety Case. The Oversight History Report includes a 'traffic light' table of comments or issues. That is, green indicates 'no significant issues remain from oversight'; yellow indicates 'significant issues remain from oversight requiring improvement'; and red indicates 'significant issues remain from oversight requiring resolution or significant improvement'.

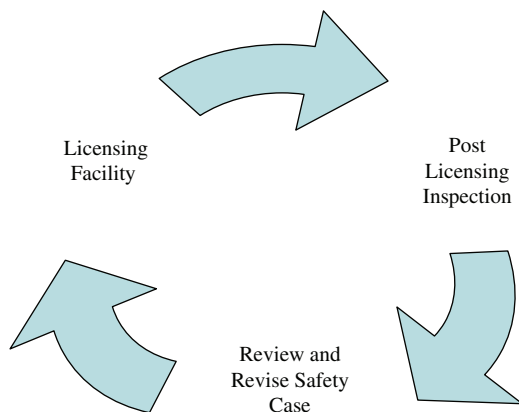


Figure 1. Cyclic regulatory driven activities

- MHF Operators were asked to develop and submit a Safety Case review plan to WorkSafe. Although not mandatory, this plan had a similar purpose to the Safety Case Outline that is mandatory for new facilities. This plan was recommended by WorkSafe because it enabled both the MHF Operators and the Regulator to focus on work necessary to be undertaken for each facility to minimise the risk of an adverse licence decision outcome.
- MHF Operators to undertake the review and revision of their Safety Case to confirm that the Safety Case is compliant in the light of new knowledge, events, changes over time and continuous improvements undertaken. During this period WorkSafe’s oversights of each MHF focused on the key activities and milestones of the Safety Case review and revise process and provided

feedback on the plan as necessary. WorkSafe also ‘pre-assessed’ some components of the revised Safety Cases and provided comments on suitability and sufficiency.

- MHF Operators must submit the revised Safety Case and licence application to WorkSafe for assessment 6 months before the existing licence expires. WorkSafe’s Lead Assessor and a team of Verifiers provided feedback during this period and provided a draft Assessment Findings Report for the MHF Operator to review and comment on prior to the Licence Advisory Panel sitting.
- WorkSafe’s Regulatory Delegate makes the licence renewal decision, supported by members of the Licence Advisory Panel. WorkSafe must determine each MHF licence renewal application within 6 months of receiving it. The Regulations do not allow an extension beyond this 6 month period.

WorkSafe’s main objective for the MHF licence renewal process was to provide feedback early so that Operators were able to take the necessary actions to submit compliant, revised Safety Cases. WorkSafe’s ability to provide such guidance and advice was clarified during a review of the Victorian Occupational Health and Safety Act (Maxwell, 2004). This review resulted in greater clarity on the Regulator’s function and powers to provide guidance and advice to persons that have a duty or obligations under the Act or Regulations (Victorian Government, 2004).

**OBSERVED CHANGES IN SAFETY PERFORMANCE AT MAJOR HAZARD FACILITIES**

Safety Case assessment plans for round 2 re-licensing of MHFs had a sharper focus on pre-submission assessment

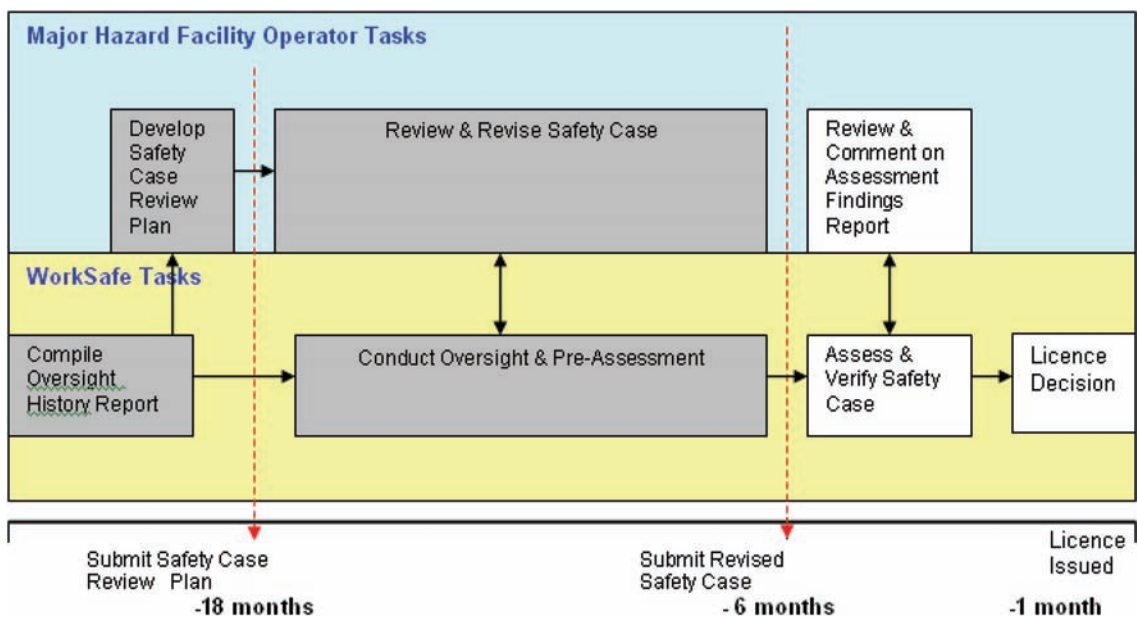


Figure 2. Process and timeline for licence renewal

and verification. There were a number of points in the process to provide early opportunities to detect and resolve issues that may result in difficulties in re-licensing. WorkSafe developed a number of key performance indicators (KPIs) designed to monitor and measure the performance of the round 2 re-licensing programme:

- Risk reduction relative to round 1
- Quality of Safety Case document relative to round 1
- Regulator resource relative to round 1
- Operator resource relative to round 1

The submission of reviewed and revised safety cases resulted in all licences being renewed on time. Observations on safety performance and effectiveness of the re-licensing process are discussed.

#### REDUCTION IN RISK

Some observations that may have contributed to a reduction in risk include;

- About 25% of facilities reduced their dangerous goods inventory that resulted in about 12% having a reduction in offsite risk.
- During round 1 licensing the safety management system (SMS) for some MHFs was new and not bedded in. Assessment of round 2 re-licensing has confirmed that most aspects of the safety management systems are now properly implemented.
- Some maturing of the SMS in areas of risk management, asset integrity inspections and systems auditing were observed.
- The majority of MHFs had identified additional risk control measures for previously identified Major Incidents and Hazards. In some cases, the additional control measures resulted in a reduction in off site-risk.
- The introduction of new technology reduced the risk, and in one instance this eliminated the need to have large quantities of dangerous goods present at the facility.
- A number of additional or proposed improvements in risk control measures during re-licensing arose from consideration of causal factors relating to significant incidents that had occurred world wide such as BP Texas City and Buncefield.

#### QUALITY OF SAFETY CASE DOCUMENT

The quality of the round 2 re-licensing safety case document relative to round 1 showed improvement. Some of the observed key features that may have contributed to this include;

- Clearer Safety Assessment information was provided. This often occurred due the application of new or improved databases for recording hazards and linking them to risk control measures and safety management system requirements. A range of sites were not satisfied with the clarity and usability of the Safety Case

documentation that was initially produced and made substantial revisions that enabled the document to be better understood by employees and senior managers.

- There were some improvements in knowledge management, for example hazard registers were simplified that allowed on-site personnel to keep them up to date.
- There was an increase in the number of facilities using diagrammatic methods via software programs that illustrated linkages between hazards, risk control measures and potential major incidents.
- A number of Operators have improved their approach to auditing risk control measures by adopting WorkSafe's inspection methodology which is based on 'points of proof' with respect to the implementation and functionality of the respective risk control measure.
- The reviews of the Safety Case provided a quality check on the original Safety Case. This resulted in corrections and a clearer description for several areas of the Safety Case. The majority of sites intentionally aimed at producing a document that was a more user friendly and 'living' document.
- The majority of facilities reported that round 2 Safety Case developments were conducted in-house, with lower reliance on consultants. This had the twin benefits of increased ownership and understanding by the Operators, and lower development costs.
- The improved clarity of the Safety Cases contributed to less time spent by the Regulator in assessing and clarifying the Safety Case which resulted in lower licence fees compared with the last licence.
- In some cases, improvements were observed in emergency plans specifically in regard to improved emergency procedures and the identification of additional resources that may be available through mutual aid agreements with other industries.

#### REGULATOR AND OPERATOR RESOURCE RELATIVE TO INITIAL LICENSING

The resource of the regulator is determined by the assessment and verification hours during the re-licensing period compared with the hours spent to initially licence the facility. On average the number of regulatory hours spent to re-licence was about 400 hours per facility compared with about 600 hours per facility for initial licensing (i.e. about 65%). Operator resource spent on reviewing and revising the Safety Case also reduced and was qualitatively estimated to be about 55% of that taken to initially develop the Safety Case. These reductions are believed to be attributed to a better understanding by both Operator and Regulator in identifying and resolving issues that required extensive clarification or intervention during initial licensing.

#### LESSONS FOR OPERATORS AND REGULATORS

A number of observations were made during the round 2 re-licensing programme which are discussed in this section.

### RENEWAL OF MAJOR HAZARD LICENCE

Guidance Note 29 “Renewal of Major Hazard Licence” (WorkSafe, 2006) provides information relevant to MHF operators in the two-year period before expiry of their existing MHF licence. The objectives were to assist with the review and revision of the Safety Case before submitting a licence renewal application.

- The guidance was generally well accepted by all facilities and the process of issuing an Oversight History Report, Safety Case review plan and conducting a pre-assessment module was fundamental in managing both the facilities and regulator resources effectively to maximise the improvement opportunities.
- Six seminars were conducted by WorkSafe in 2006 which also included a number of presentations from MHF Operators on examples illustrating their approach to identification, assessment, control and emergency planning in regard to major incidents. Each of the six seminars was well attended by 75 to 100 attendees. Attendees were predominantly employees of MHF Operators (about 65%) and the remainder included managers from sub-MHF dangerous goods facilities, consultants, and lecturers from tertiary education. The six seminars were positively received by industry with about 86% reporting that the knowledge gained was relevant or valuable, and 84% reporting that the overall content was good or excellent. The seminars served an important part in collaboration between the Regulator and MHF Operators in gaining a broader understanding of the expectations of what compliance looks like for a reviewed and revised Safety Case.
- Corporate memory in a cyclic Safety Case review and revise process had the potential to be problematic to both Operator and Regulator. This was particularly evident where there were changes in Safety Case Manager and/or WorkSafe’s Safety Case Officer for regulatory oversight of those processes.
- The documented methodology used for the review and revision of the Safety Case needs to be documented in sufficient details to allow such process to be consistently repeated by persons who may not necessarily have been involved in the preparation of the previous Safety Case.

### PERFORMANCE MONITORING & AUDITING

Performance Monitoring and Auditing has improved from the relatively low base as observed during initial licensing of MHFs. Some MHF Operators have developed a clear and meaningful set of performance indicators for measuring the effectiveness of risk control measures. However, other facilities continued to have less meaningful safety performance measures which were typically revealed during site verifications. These deficiencies resulted in a number of facilities receiving conditions on their licence requiring annual demonstrations that their performance monitoring

and auditing systems are detecting and correcting deficiencies with the effectiveness of risk control measures.

‘Performance monitoring and auditing’, as required in Schedule 10 of the regulations, was identified as an opportunity requiring further improvement and consistent application.

### INDEPENDENT RESEARCH INTO THE VICTORIAN SAFETY CASE REGIME

Independent research into the effectiveness of the Victorian Safety Case regime was undertaken in October 2003 (Sweeney Research, 2003) and in March 2009 (Haines, 2009). The results of this research are discussed.

#### Independent Research – October 2003

A total of 156 interviews were conducted across the 36 MHF Operator organisations and the findings were generally positive and supportive of the Safety Case regime. Some difficulty was mentioned by around one-third of all respondents in obtaining an understanding of what was needed in order to prepare the Safety Case. About half of all Plant Managers and half of all Safety Case Managers provided this response. Similar findings were found from a questionnaire survey conducted by the regulator (WorkSafe, 2004).

In response to this study, the guidance material was updated and additional guidance was presented at education seminars conducted during third quarter of 2006. In addition, a more ‘hands on’ regulatory process was developed, as described in the previous section for the licence renewal process. One of WorkSafe’s objectives for this licence renewal process was to provide feedback early so that Operators were able to take the necessary actions to submit compliant, revised Safety Cases. For this reason, round 2 Safety Case assessment plans had a sharper focus on pre-submission assessment and verification with a number of points in the process providing opportunities for early detection and resolution of issues. This assisted in ensuring that any gaps or issues that may result in difficulties in licensing are identified and remedied before the licence decision is made. The measures developed to monitor the effectiveness of re-licensing Victorian MHFs are designed to monitor and measure the performance in achieving this overall objective.

#### Independent Research – March 2009

The abstract for the report (Haines, 2009) on the survey of Victorian managers of MHFs that was completed in March 2009 states:

*“This paper reports on a survey of Victorian Major Hazard Facility managers as a follow up to earlier comparative case study research of regulation encompassing MHF, counterterrorism and financial regulation. The case study research suggested that the Victorian*



*MHF safety case regime could be viewed as a 'best case scenario' amongst the three regulatory regimes studied. The results of the survey support this positive assessment of the Victorian safety case regime and the critical role played by the regulator independently from the regulations they are charged to administer. The survey also provides an important window into understanding what assists in compliance with safety case requirements and the way managers' deal with business pressures and competing regulatory demands that may threaten safety levels at their respective sites."*

The survey covered 78% of all Victorian MHFs and covered a range of industries, with 42% in the petroleum sector, 41% comprised storage facilities only, and 59% of the sites had processing components. The actual survey results are illustrated in the report by ten figures and charts. However, for the purpose of this paper some of the main results are consolidated in Figure 3 to illustrate the overall positive responses to the survey questions.

The conclusions indicate positive findings from the survey which may be attributed to a combination of the stringency of the regulations together with the collaborative, problem solving approach of the regulators that may both reduce risk and create an alertness concerning major hazard risk for both employees and senior management.

The survey report has acknowledged that the success of the Victorian Safety Case regime does not come easily. It is resource intensive (for both the Regulator and facility

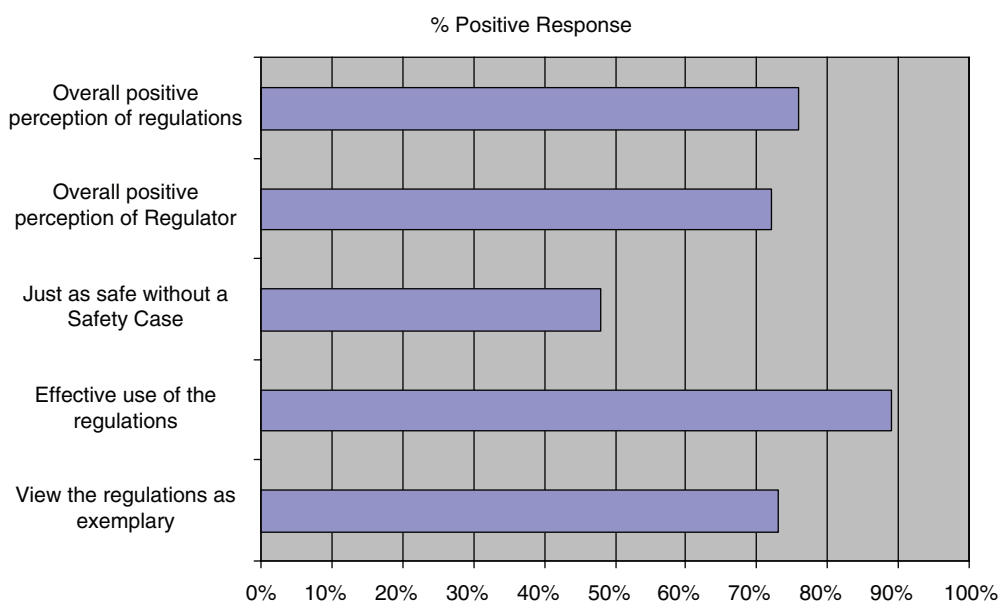
Operator) and requires managers skilled in bringing together internal procedures with regulatory requirements, resolving tensions between business pressures and compliance, and finally dealing with the occasional conflict that arises between regulatory regimes.

## CONCLUSIONS

An application for renewal of a licence to operate a MHF, and the accompanying revised Safety Case, must be assessed and a licence decision made within six months of its submission. This rigid regulated timeline has strongly influenced the collaborative and transparent interaction between Operators of Victorian MHFs and the Victorian Regulator. A 'hands-off' regulatory approach to licensing Victorian MHFs is believed to increase the likelihood of licence conflicts and the possibility that Operators and Regulators may fail to recognise opportunities to further reduce or control risks from major incidents.

The Safety Case regime in Victoria was implemented relatively quickly and existing facilities were licensed within 3 years after the regulation came into effect on 1st July 2000. Since initial licensing, observations indicate that the Safety Case regime has influenced a reduction in risk from major incidents. Although still resource intensive, the second round of licensing of MHFs has required less resource than round 1 for both the Operator and Regulator. This is believed to be attributed to improvements in systems and their implementation at the facility, and the ability of Operators to demonstrate their effectiveness at managing risks.

Guidance material and education seminars have proved to be very useful in assisting Operators and Regula-



**Figure 3.** Extract summary from survey of Victorian managers of major hazard facilities

tors to gain a common understanding of what is involved in reviewing and revising a Safety Case, and the importance of demonstrating the effectiveness of risk control measures through good performance monitoring and auditing systems.

Independent surveys of the Victorian Safety Case regime have been positive and tend to support the anecdotal views of those Inspectors and other safety professionals that administer the regulations.

#### NEXT STEPS

WorkSafe will continue to adopt a collaborative or 'hands on' approach to regulating MHFs, but knowledge gained from past interaction with Operators of MHFs will allow regulatory inspection to target areas that may greatly influence a reduction in risk.

Guidance and education material will continue to be improved, in particular in the area of practical guidance on performance monitoring, auditing systems and risk control measures linked to potential major incidents.

The 'hands on' regulatory approach is also being implemented for the administration of the regulation of mines which WorkSafe became the regulating authority for on 1st January 2008.

#### REFERENCES

- Cooke, G. and Sheers, R. 2003, Safety Case Implementation – An Australian Regulator's Experience, Hazards XVII, Symposium Series page: 605.
- Cooke, G. Sinclair, S. and Sheers, R. 2004, Post Licensing Oversight and Inspection of Major Hazard Facilities – An Australian Regulator's Experience, Hazards XVIII, Symposium Series, page: 952.
- Haines, F. and Phung, P. T. 2009, "Thoughts, feelings, action": survey of Victorian managers of major hazard facilities, National Research Centre for OHS Regulations, Working Paper 65 (March 2009).
- Maxwell, C. 2004, Occupational Health and Safety Review, State of Victoria, March 2004, ISBN 1920921044.
- Sweeney Research Pty Ltd 2003, Victorian WorkCover Authority Evaluation of Major Hazards Implementation Study No. 13256, October 2003.
- Victorian Government 2007, Occupational Health and Safety Regulations 2007, Statutory Rule No. 54/2007.
- Victorian Government 2004, Occupational Health and Safety Act 2004, Act No. 107/2004.
- WorkSafe Victoria 2004, Oversight and Safety Case Feedback Survey Report, January 2004.
- WorkSafe Victoria 2006, Major Hazard Facilities Regulations Guidance Note 29 – Renewal of Major Hazards Licence (Major Hazard Facilities) Regulations.