THIRD AUDIT OF THE MINE SAFETY UNIT AND OFFICE OF CHIEF INSPECTOR OF MINES, WORKSAFE TASMANIA

Professor Michael Quinlan PhD, FSIA
School of Management
University of New South Wales

April 2014

TABLE OF CONTENTS

BACKGROUND, METHODS AND BENCHMARKS

This is the third audit (previous audits were undertaken in 2010 and 2012) initiated following recommendations of Coroners investigating a number of underground fatalities in Tasmanian mines. The terms of reference for this audit are the same as those applying to the audit undertaken in 2012 namely:

1. Assess adequacy of current physical resources to administer the legislation applicable to mines, quarries and mineral processing industries throughout Tasmania by:
   Confirming the structure (Organisational Chart) for the Department
   Confirming the key responsibilities for the Department resources
   Confirming the "training needs analysis" and the identified capability gaps impacting the achievement of the Department objectives

2. Assess adequacy of financial resources to provide for an inspectorate to a standard equal to that expected at a national level.

3. Review effectiveness and capability of Inspectorate activities.
   Identify reactive and pro-active capability and effectiveness.
   Identify investigation management and effectiveness.
   Review administrative functions undertaken by the Mine Safety Unit

My background and experience for undertaking this task can be stated as follows. I have considerable knowledge of occupational health and safety (OHS), being the author of the standard OHS management text (for both tertiary students and OHS professionals and practitioners) used in Australia and New Zealand (now in its 3rd edition, 2010) and have also undertaken (either alone or with others) nine state and federal government investigations/inquiries into OHS. Since 2003 I have undertaken a number of detailed examinations of OHS and mine safety inspectorates in Australia and overseas, including Workplace Standards Tasmania (formerly WorkSafe Tasmania).

More specific to mining, in 2004-5 I was an appointed expert panel member to the New South Wales Mine Safety Review which examined an array of matters, including, the skill set, training and operations of the mines inspectorate. In 2006 I was appointed as OHS expert to the Independent (headed by Greg Melick) Investigation into the death of Larry Knight at the Beaconsfield Gold Mine, preparing a detailed report as well as giving evidence to the subsequent coronial inquest. The report I prepared included a detailed examination of the comparative resourcing (historical and inter-jurisdictional) and operations of mine inspectors in Tasmania.

Knowledge on OHS including mine safety, inspectorates and Tasmania formed a base for framing this audit and assessing some observations made to me during the audit. While the historical context is important this audit report will presume familiarity with the findings of earlier coronial inquests and investigations in Tasmania (notably those pertaining to fatalities at Beaconsfield, Cornwall Colliery and Renison). Rather, attention will focus on those aspects most salient to the current audit, building on the

findings of earlier audits in 2010 and 2012. It will also draw on recent experience in New Zealand which is of relevance.

In 2011 I was engaged by the New Zealand Department of Labour to prepare three reports on mine safety and mine safety regulation as part of its response to the Royal Commission into the Pike River Mine Disaster where 29 miners were killed by a methane explosion in November 2010. My reports informed the fourth (policy review) section of the Royal Commission's deliberations. One report sought to identify best practice in mine safety regulation by comparing regulatory regimes in six countries (including Australia). The review found that NSW and Queensland represented world's best practice in mine safety regulation – a view accepted by the Royal Commission and subsequently by the New Zealand government which used these jurisdictions as a model for its own mine safety legislation. A second report examined mine safety performance in five countries, focusing on fatal including multiple fatality incidents - including a number of fatal incidents in Tasmanian mines. The report identified 10 pattern causes of mine fatalities, namely:

- engineering (including maintenance) and design flaws
- failure to heed warning signs,
- flaws in risk assessment
- flaws in management systems,
- flaws in system auditing,
- economic/reward pressures compromising safety,
- failures in regulatory oversight,
- worker/supervisor concerns that were ignored,
- poor worker/management communication and trust
- flaws in emergency/rescue procedures.[1]

These findings, too, have implications for this audit, including how well the regulatory regime address repeat causes of serious incidents. The third and final report assessed a mine safety review undertaken by the New Zealand Department of Labour in 2008-9, that is shortly before the Pike River mine disaster in 2010. In late 2012 I was appointed as a member of the Expert Reference Group which throughout 2013 had the task of overseeing the substantial reforms to mine safety regulation in New Zealand. These laws were enacted in 2013 in conjunction with a substantial upgrading of the mines inspectorate which had commenced shortly after Pike River.

Lessons that can be drawn from the Pike River mine disaster have relevance to the current audit and New Zealand provides a useful benchmark for Tasmania. Like Tasmania it largely abolished specific mine safety laws when post-Robens OHS laws were introduced and merged the mines inspectorate within the general OHS safety inspectorate. New Zealand did retain a set of mine safety regulations which Tasmania did not. Like Tasmania New Zealand has a relative small mining industry (compared to say NSW or Queensland) consisting of both underground coal and metalliferous mines (in 2011 there were four underground mines operating in New Zealand). Indeed, if anything the mining industry in New Zealand is somewhat smaller than

[1] A more detailed examination can be found in Quinlan, M. (forthcoming), *Ten Pathways to death and Disaster: Learning from Fatal Incidents in Mines and Other High Hazard Workplaces*, Federation Press, Sydney.

Tasmania. This audit will use New Zealand as a benchmark on several critical issues like determining an adequate level of inspectorate resourcing. .

Responding to a series of critical coronial inquests, in 2011 the Tasmanian government made a number of changes to mine safety laws. Tasmania re-instituted mine specific regulation and did so in a way that now imposes more stringent requirements with regard to OHS management systems. In Tasmania in the aftermath of the Cornwall Colliery, Renison metal mine and Beaconsfield gold mine fatalities regulations were introduced that placed more stringent and detailed requirements on mine operators in terms of management systems, risk assessment, management structures, managerial responsibilities/qualifications and consultation. This was secured by introducing a *Mine Safety Act* to operate in conjunction with the *Workplace Health and Safety Act* and a single set of mine specific regulations.[2] Having a single set of regulations incorporating all mine safety related regulations makes sense as it provides a single reference point for inspectors, mine operators and managers, employee safety representatives, unions and other interested parties.

The hazard specific regulations were designed to ensure that basic standards were met and reinforce the effectiveness of systems in relation to well-known hazards (such as poor ventilation and rock falls). The key changes made included that mine operators must develop, implement, maintain and review a documented health and safety management system to protect the health and safety of mine workers and other persons who may be exposed to risks arising from mining operations. For underground mines, where 10,000 hours or more per month are worked at a mine, the site senior officer must also have risk management training, or relevant experience, meeting the requirements of the Chief Inspector of Mines and a university mining engineering degree or equivalent qualification (if there is no person appointed with mining engineering qualifications to assist the site senior officer).

The revised Tasmanian mine safety regulatory regime also requires mine operators to develop, implement, maintain and review a documented health and safety management system to protect the health and safety of mine workers and other persons who may be exposed to risks arising from mining operations. The health and safety management system must include documentation of the management structure for the mine; major hazard management plans required by the regulations; risk management processes and procedures; an emergency response plan; provision for the review and improvement of the health and safety management system; a fitness-for-work program and a health surveillance program. The legislation/regulation also includes more detailed requirements with regard to risk management and major hazard plans. With regard to risk management existing regulatory requirements (clauses 17-19 of *Workplace Health and Safety Regulations, 1998*) are supplemented by provisions explaining the concept of systematic risk management; a requirement to consider the skills mix necessary to undertake the various steps in the risk management process and to ensure the process is led by a competent person; and a requirement to keep a written record of all risk assessments required by the regulations. Similarly, the provisions pertaining to major hazard management plan indicates this is required where a non-negligible risk of multiple or repeat fatalities arising from a hazard is identified in the hazard

[2] *Workplace Health and Safety Amendment (Mine Safety) Act 2010; Workplace Health and Safety Amendment (Mine Safety) Regulations 2011*

identification/risk assessment process; if required by an inspector (subject to similar criteria); or where required by a regulation relating to a specific hazard (inrush and flooding, airborne dust, powered mobile plant, and electricity).

Finally, the requirements with regard to systems/major hazard plans are augmented by hazard specific regulations dealing with ground control and geotechnical considerations (including seismicity); Inrush and flooding; shafts and winding equipment; atmosphere, airborne dust and ventilation; vehicles and powered mobile plant; and electricity. Taken as whole, the revised regulatory regime in Tasmania clearly targeted deficiencies revealed by the Cornwall Colliery, Renison and Beaconsfield mine incidents in terms of providing more detailed requirements with regard to safety management systems/major hazard plans (including accountabilities), risk assessment (including documenting the process), and reinstituting hazard specific regulations (to address well known hazards and require the reporting/notification of incidents, events or information pertaining to these hazards).

In addressing shortcomings identified in a series of coronial inquests the revised regulatory framework also addressed a number of the pattern errors I identified above. The revised safety regulation also brought Tasmania closer to the mine safety regulatory regimes operating in other states, being broadly based on those found in NSW and Queensland. The audit undertaken in 2012 found that the mine inspectorate was generally making good use of the regulatory framework to improve compliance and safety standards more generally.

Despite these improvements, regulatory requirements in Tasmania are not as comprehensive as those found in NSW and Queensland or indeed those introduced into New Zealand following Pike River. It is beyond the province of this audit to make a detailed comparison current Tasmanian legislation with that of New Zealand, NSW and Queensland. The audit does recommend such an exercise needs to be undertaken in order to identify and address gaps in the current regulatory framework because it affects the capacity of the inspectorate to carry out its tasks effectively. At this point it is enough to identify several important areas of difference, which include:

- the degree to which the nature and content of major hazard plans are specified
- the absence of requirements with regard to certified competencies of key personnel working in mines
- gaps in prescriptive requirements relating to known hazards, including those pertaining to coal mining
- much weaker provisions relating to the role of worker representatives
- less prescription/guidance with regard to emergency/rescue procedures
- failure to require independent auditing of mine safety systems to help ensure these systems are robust and working as designed

I will return to this issue later in the audit.

For the purpose of this audit I collected information pertaining to the organisational structure and budget of the Office of Chief Mines Inspector as well as other written materials. Within WorkSafe Tasmania I interviewed the General Manager of WorkSafe Tasmania (Martin Shirley), Compliance Director (Neil Buchanan), Chief Mines Inspector (Fred Sears), and four inspectors attached to the Office of Chief

Mines Inspector namely (Trevor Marshall, Mark Smith, Paul Murphy and Andrew Tunstall. With regard to employers and industry bodies I interviewed Jeremy Kuouw, formerly with Nystar and a Director of the Minerals Council of Tasmania; Matt Daly, manager of the Henty Gold mine; Gilbert Charles, manager of Grange Resources; and Cassie Arnold, manager of the Cornwall Colliery. In terms of union representatives I interviewed the Tasmanian branch secretary of the Australian Workers' Union in Tasmania (Ian Wakefield) and Tasmanian secretary of the Construction Forestry and Mining Union (Chris Hinds). I also interviewed a mining consultant with 25 years mining experience (from mine-worker to engineer) and considerable knowledge of Tasmania (John Webber). As in 2012 I also conducted mine-site visits, though only one on this occasion, in order to gain more insights into the operations of mine inspectors and mine safety more generally. I would like to express my sincere gratitude to the cooperation afforded to me for the purposes of the audit by those just mentioned as well as other managers, supervisors, employee safety representatives and workers I spoke to in the course of a workplace visit. Every request I made for information, to accompany inspectors on workplace visits or to access to someone to interview was forthcoming.

In terms of the audit process, inspectors were asked questions (using a semi-structured questionnaire) about their background, training/qualifications, access to further training/skills enhancement, employment conditions, responsibilities and activities. They were also asked for their views on standards/guidance material and their experience in terms of hazard identification, OHS management and the like in mines and other workplaces (mineral processing and quarries) for which they were responsible. Another set of questions dealt with the current regulatory framework and its adequacy in relation to coal and metalliferous mining in particular. Their views were also sought in relation to activities with regard to eight known major hazards in mining, most of which were also relevant to mineral processing and quarrying. Inspectors were asked if there were any deficiencies and if so to identify these. Inspectors were also asked to evaluate changes in the inspectorate's activities and the response of mines and other workplaces since the previous audit (2012). Finally, inspectors were asked if they had any further comments or additional remarks to make. The General Manager of WorkSafe Tasmania and Compliance Director were asked for their views of the administration and operations of the Office of Mines Inspectorate.

The interviews with industry and union representatives and consultants also asked a series of questions (again using a semi-structured questionnaire) to gauge their perceptions of the inspectorate's resourcing, training/qualifications, structure and activities, including changes that had occurred since 2012. They were also asked their views about the regulatory framework, worker communication/involvement and the state of OHS management in Tasmanian mines, mineral processing and quarries, including any changes and the reasons for this. Their views were also sought in relation to activities with regard to eight known major hazards in mining, most of which were also relevant to mineral processing and quarrying. Industry and union representatives were also asked about their relations with the inspectorate and other parties. They were also invited to express any views or volunteer opinions they deemed relevant to audit or safety in mining, mineral processing and quarrying in Tasmania more generally.

As in 2012 the mine visit included detailed observation (according to well established protocols I have used previously in researching inspectorates) of the nature/context of the visit, what was examined, who was spoken to and the discussions between the inspectors and managers and others at the workplace prior to or after the actual physical observation phase.[3] I also had an opportunity to raise issues relevant to the audit with managers (such as the adequacy of inspectorate visits and their impressions regarding trends in OHS within their workplace and more generally). I also had a chance to examine the site visit report prepared by the inspector. Overall, the workplace visits proved an extremely valuable adjunct to interviews (for example providing clear examples of particular issues, opportunities to speak to the managers and workforce of individual workplaces, and as a means of 'testing' formal interview responses). It is my strong recommendation that workplace visits should form an essential element of any subsequent audit.

In addition to the information sources just mentioned I examined budgetary and documentary information relating to OCIM and WorkSafe Tasmania (including the organisational chart reproduced in the Appendix). Employers, Industry representatives and others also generously provided documents relevant to my considerations. A number of these documents were useful in testing or corroborating information I obtained from workplace visits and interviews.

The approach just described was similar to that used in 2010 and 2012, dictated, in part, by a belief that this was the most appropriate basis for evaluating the Office of the Chief Inspector of Mines in terms of the audit criteria. As indicated in 2010 and 2012 it would have been useful to have also undertaken a detailed examination of notices issued and other actions taken by inspectors. While unable to do this I was able to explore the use of notices with various parties during both interviews and my mine site visit.

[3] This information was recorded in a notebook. See Walters, D. Johnstone, R. Frick, K. Quinlan, M. Gringras, G. & Thebaud-Mony, A. (2011) *Regulating Work Risks: A comparative study of Inspection Regimes in Times of Change,* Edward Elgar Cheltenham, UK. Chapter 5.

INSPECTORATE RESOURCING, NUMBERS AND QUALIFICATIONS/SKILLS SETS

In order for the mines inspectorate to carry out its tasks effectively key requirements include an appropriate number of suitably trained/qualified and experienced inspectors with adequate logistical support. The latter includes administrative support (and IT systems), vehicles and other equipment, and access to conference/training opportunities to update skills and exchange knowledge with colleagues in other jurisdictions. Resourcing needs to be measured against the scope of activities that mine inspectors must undertake. In Tasmania, like some other Australian jurisdictions, mine inspectors are responsible for open cut and underground mines, mineral processing plants and quarries. From time to time they may also be called upon to inspect and provide expert advice with regard to civil construction tunnelling (and this has occurred in Tasmania).

At the time of the 2014 audit the OCIM had responsibilities covering five underground mines namely the Cornwall Colliery (in the Fingal Valley) and four metalliferous mines (Mt Lyell, Renison, Rosebery and Henty) on the West Coast. There are also several small mineral specimen mines on the West Coast. There are large surface (open cut) operations at Savage River (north-west) and Railton (located between Launceston and Burnie) Medium sized open cut mines and quarries are to be found at Mangana (underground), Tasmanian Mines, Circular Head, Sibelco, HBMI quarry, Boral quarry and Shree Minerals. A large number of small quarries are located throughout the state. Significant mineral processing facilities are to be found at Port Latta (attached to Savage River), Pacific Aluminium, Temco and ECKA granules in the Tamar Valley, and at Nyrstar located near the northern suburbs of Hobart. In sum, the OCIM has regulatory oversight of a significant number of high hazard workplaces, some large, and many located in relatively remote regions of the state. While public attention/awareness tends to be focused on underground mines, the number of workplaces the OCIM is responsible for is actually far larger. A similar situation became apparent when the New Zealand regulatory regime was revised in the aftermath of Pike River.

As noted in previous audits (2010 and 2012) the number and (though to a lesser extent) qualifications of inspectors were sources of major concern raised in several coronial inquests (notably into the 2006 Beaconsfield and 2000 Cornwall fatalities). At the time of the rockfall that killed Larry Knight at the Beaconsfield mine in 2006 there were only two operational mine inspectors in Tasmania, only one of whom had qualifications in mine engineering. The already mentioned coronial inquests found the number of inspectors was manifestly inadequate for them to carry out their legislative tasks effectively. This should not have come as a revelation. Prior to the Beaconsfield fatality on several occasions both the Minerals Council of Tasmania and unions had called on the government to appoint of additional mine inspectors. Documented concerns about the number of inspectors had also been raised within the mine inspectorate itself shortly before the Beaconsfield rockfall.

In 2009 the Beaconsfield coronial inquest recommended that the mine inspectorate should consist of six inspectors. Following this efforts were made to increase the number of inspectors – a process made somewhat difficult by the mining boom and consequent efforts to expand mining inspectorates in Queensland and Western

Australia in particular. By the time the 2010 audit there were five inspectors responsible for mines, mineral processing plants and quarries in Tasmania, two based at WorkSafe Tasmania's (then Workplace Standards Tasmania) Burnie office (north-west), one at the Launceston office (north) and two at the main Rosny/Hobart office (south), including the Chief Inspector of Mines. Drawing on a range of evidence the 2010 audit recommended that mines inspectorate be increased to six inspectors (which was also consistent with the recommendations made by the coroner into the Beaconsfield mine fatality).At the time of the 2012 audit the establishment remained at five but two inspectors (one based in Hobart and one based in the Launceston office) were on secondment/leave without pay (one for a year and the other for three months who returned as I was completing this report). Two of the five inspectors on establishment (including the Chief Inspector) held mine engineering qualifications and had experience in managing metalliferous mines. The other three inspectors did not hold mine specific qualifications although they did hold qualifications and experience useful in the mining context (for example, one had particular knowledge of machinery while another was knowledgeable with regard to safety systems and emergency planning in high hazard work settings). At the time an appointment process was under way with regard to another inspector to the Burnie office and after the audit this appointment was finalised with the appointee coming from the police service where he had developed a strong skill-set relating to investigation. The 2012 audit examined the needs of the quarrying industry which represents a hazardous activity in terms of the potential for serious injuries. Drawing on this and other evidence the audit recommended that the mines inspectorate be increased to six inspectors, with one inspector to be principally responsible for quarrying.

In the period between the 2012 audit and 2014 audit the mine inspector on secondment (to a Tasmanian mine) opted to resign in order to stay with the mine. While such movements are to be expected, and indeed are not necessarily a bad thing (by helping to enhance compliance knowledge in the industry), it was symptomatic of a problem identified in both the 2010 and 2012 audits. This is that the salary scale available to both non mine-engineering and engineering-qualified inspectors has not been put at a sufficiently sustainable footing (this issue is examined in more detail later in the audit report). The logical points of comparison for benchmarking purposes are, firstly, the salary level paid for similarly qualified applicants in the mining industry in Tasmania. Too great a gap will make it both hard to attract applicants with knowledge of mining from the local industry and also risk losing anyone who has or acquires such skills (as has occurred). A second, comparison point is what is paid to inspectors with similar qualifications in other mining jurisdictions. Leaving this issue to one side the immediate effect was to reduce the mine inspectorate to five.

When I undertook the audit in February 2014 two of the five remaining inspectors were at the point of leaving, one by retiring while the other had informed the Chief Inspector he was resigning. At that point of time, although the retirement had been well-flagged the position had not been advertised. As result the position may remain vacant for several months if not longer until suitable replacement appointments are made. When I asked why this was the case, I was informed (by several parties) that it was standard policy not to fill a position until it had been vacated. While this approach may be acceptable in some circumstances it is not acceptable with regard to a small body of inspectors (with limited capacity to redeploy activities) in a high hazard industry like mining. I recommend that the process of finding a replacement

should commence as soon as a departure is known in order to minimise (ideally eliminate) the gap period between departure and a new appointment coming on board. Even some overlap in this regard is valuable because it enables a retiring/resigning inspector to familiarise their successor with operational activities. As of March 2014 there are three operational mine inspectors in Tasmania – only one more that at the time of the Beaconsfield mine fatality. Arguments that this is only a temporary situation are unlikely to carry much weight with an independent investigation/coronial inquest if Tasmania were to experience a serious mine incident during this 'interregnum'. Given its already small size the OCIM efforts must be made to ensure the establishment and operational number of inspectors is aligned.

Also relevant to the last point is the question of succession planning. The 2012 audit pointed out that a number of inspectors were approaching retirement age (one has recently retired) and that some planning was required to ensure the departures did not lead to a critical loss of knowledge and experience. This audit finds the situation continues to require consideration as one of the engineering qualified mine inspectors (the Chief Mines Inspector) is approaching an age where retirement is possible.

I now want to return to the issue as to whether the existing establishment of five inspectors is adequate for the tasks they have to fulfil. I will also deal with the question of qualifications/skill sets as part of this examination. In making this assessment I drew on the following sources.

- Interviews with a range of parties identified earlier along with my own observations during the audit.
- Comparisons with I know of mine inspectorates in other jurisdictions that represent 'best practice'. This information has implications for assessing the adequacy of resourcing but also operational effectiveness which is examined in a later section of this audit report.
- Benchmarking against the resourcing of a similar small mine inspectorate in New Zealand. I contacted the Chief Mines Inspector to obtain this information and verify current practices against what I had already learned during my involvement with the Pike River investigation and Expert Reference Group. The reasons why I believe New Zealand represents the most appropriate benchmark have already been identified.

This evidence will be dealt with in turn.

1. <u>Evidence from audit interviews and observations</u>

In February 2012 Tasmania had five underground mines (one coal mine and three metalliferous mines) as well as a number of open cut metalliferous mines, mineral processing facilities (several being large) and over 100 quarries (mostly small but with some larger operations). Shortly after the 2012 audit the Beaconsfield gold mine, north of Launceston closed though mineral processing of tailings trucked to the mine continues to occur periodically. Mining tends to be a volatile industry due to factors such as trends in ore prices and investor decisions relating to new 'start-up' operations (several projects are under consideration in Tasmania at present). As four to six underground mines have operated in Tasmania over a long period; open cut and mineral processing include a number of large and long-established operations; and

quarrying is an ongoing requirement the most viable presumption – and the one applied in this audit – is that these activities will continue roughly around the present level.

At the time of the current audit there were five inspectors but as one departed within a short time of the audit (another will leave shortly) it is appropriate to concentrate on the qualifications of those serving in the mines inspectorate. The inspector retiring had a non-mining background but expertise in machinery inspection which is relevant to mining. The inspector who indicated they would resign shortly had a background in the Police and experience in investigation (more will be said about this in a later section of the audit report). The three other inspectors were serving at the time of the 2012 audit (along with two of the three who have since departed) where their qualifications and background were provided in some detail. Thus, examination of their qualifications and experience in this audit will be abbreviated to those most salient to the current review. As already mentioned two inspectors have mine engineering qualifications (Bachelor degree) and experience in senior metalliferous mine management. These are the qualifications that would normally be expected of a mine inspector, and there are very sound reasons for this.[4]

Mining, and especially underground mining is both hazardous and requires a high degree of technical expertise to make judgements about mining methods (including extraction sequencing), ground support, understanding geology, strata and seismic activities and a range of other matters. Mine management need the training/qualifications, experience and expertise to make these judgements. Operational supervisors too require a level of knowledge and experience to make informed judgements that can have profound implications for both ore production and safety. Mining is also a dynamic activity where conditions (to do with strata/faulting and the like) can change significantly over time, as mining proceeds deeper or due to changes in the nature of the material being mined through. I directly observed evidence of all the points just made during my visits to mines with inspectors both in 2012 and 2014 as part of the audit. Indeed, I am extremely grateful for the time and effort several managers spent explaining and discussing these issues with me in the context of their own operations. The key point is that in evaluating mining operations in terms of their safety and compliance with the standards laid down in legislation mine inspectors need to understand the technical aspects of mining operations to a degree not matched by most other industries (though note even in areas like construction inspectors commonly have a both expertise and considerable background in the industry). They need to be able to explore and discuss often complex and nuanced technical points with management, to identify problems, seek clarification and on occasion make a judgement contrary to that of mine management. Without an engineering background and mining experience an inspector would not be in position to do this.

[4] It is worth noting in passing that the importance of knowledge and experience also applies to worker representatives in mining in the states of NSW and Queensland. Site safety and health representatives (SSHR) appointed to a particular mine must have considerable mining experience (typically a decade or more), often have technical competencies (operating mine machinery or electrics) and in practice must also have the confidence of the workforce in terms of their knowledge of safety. Full-time industry safety and health representatives (ISHR) who can visit a range of mines and have some powers similar to those of government inspectors and who are commonly drawn from the ranks of experienced SSHRs must also hold an underground mine supervisors certificate and have commonly acted in a managerial/supervisory capacity in mining operations.

Therefore, two of the four mine inspectors currently working at WorkSafe Tasmania have the formal qualifications and experience normally expected of mine inspectors (elsewhere in Australia and beyond), one of whom is the Chief Mines Inspector. In addition to this both have undertaken specialised training in risk assessment/management in mining – the G3 course provided by David Reece (an expert witness to the Pike River Mine Tragedy Royal Commission). Again, this knowledge is required due to the emphasis placed on management systems and risk assessment in mine safety legislation (including Tasmania and especially after the regulatory changes made in 2011).

However, neither inspector has qualifications or experience in coal mining. Coal mining and metalliferous mining normally occupy distinct streams within mine engineering training programs in recognition of a distinctive set of hazards associated with each (including the explosive/inflammable qualities of methane and other gases associated with coal mining like hydrogen as well as coal dust, the capacity of coal to spontaneously combust, and the risk of asphyxiation in coal outbursts). In NSW and Queensland, coal and metalliferous mining are regulated by separate bodies of legislation and the mine inspectorates too are subdivided into distinct groups of coal mine inspectors and metalliferous mine inspectors. In short, neither engineering trained mine inspector currently employed in Tasmania has the qualifications, knowledge and experience to undertake full and comprehensive inspections of a coal mine. While Tasmania only has one coal mine at present this is a very serious gap. Whether or not the Cornwall Colliery is judged to be a high, medium or low risk coal mine (evidence available to me suggests the latter) is irrelevant because conditions within mines can and do change and, most fundamentally, it is an underground coal mine with all the hazards and particular needs specific to such an operation.

The third inspector currently employed has background and tertiary qualifications environmental design, fire emergency/emergency response management in major hazard facilities and significant operational experience in those fields. He has gained international experience in the offshore oil and gas industry in a strict risk management and Safety Management System regime. He has also undertaken a number of short courses in OHS management systems (OHSMS), OHSMS auditing, underground mining and ground support, and like the other two inspectors the G3 risk management course referred to earlier. This is a valuable and relevant skill set given the coverage of large mineral processing operations that including a range of significant hazards including the storage and use of very toxic chemicals. He is also able to assist the other two inspectors as well as inspect quarries in the southern part of the state.

The OCIM has no inspector with specialist knowledge of electrical systems though it is able to draw on the services of an electrical inspector from another area of WorkSafe Tasmania. Electrocution is one of eight common sources of fatal injury in mining operations and faulty electrical systems can be a source of fire in mines (and mineral processing and quarries) including ignition of explosive gases in coal mines. Jurisdictions like NSW and Queensland have specialist electrical inspectors in mining for this reason. The audit did not have sufficient information to determine whether current arrangements in Tasmania are adequate in this regard although a number of interviewees raised concerns, arguing there was a need for more dedicated expertise

(though also recognizing the difficulties in this regard). The adequacy of current arrangements should be reviewed.

Whether the mines inspectorate would be best served by appointing additional non-specialist mine inspectors to replace those that have recently left or about to leave and whether there is a need for a dedicated quarry inspector are critical questions. The 2010 and 2012 audits both identified a serious deficiency in inspectoral oversight of quarrying due to resourcing constraints. These reports noted that notwithstanding this neglect, quarrying was a hazardous activity marked by serious injuries and fatalities across Australia. While some quarries (especially larger operations) had implemented OHS management systems and the industry associated was trying to improve OHS practices, this was challenging given the large number of often small and widely dispersed quarrying operations and that the overall standard of OHS management was low. The audits recommended that a dedicated inspector be appointed to address this issue. I will return to this issue and the most appropriate skill mix for the mine inspectorate later in this section of the report.

With regard to the adequacy of the current establishment interviews undertaken in the course of this (2014) audit was consistent with audits undertaken in 2010 and 2012. As in previous audits I placed overwhelming weight on the views expressed by those independent of the inspectorate, namely employer/industry representatives, union representatives and an independent expert mining consultant. The unanimous view expressed was that the present establishment of five was inadequate, with one industry/employer representative describing the current number of inspectors as 'too lean' while another interviewee believed a complement of seven inspectors was required if mines were to be adequately audited and quarries were to receive adequate oversight (see later sections of this audit). In addition to the points just made a number of other observations were made to support their views as to inadequacy of present staffing levels, including the inability of the inspectorate to carry out sufficiently regular inspections, to be able to rapidly respond to call-outs at particular work-sites, to implement more proactive monitoring and targeted campaigns or to have the resources to fully implement the new legislative requirements. Some interviewees expressed frustration that the resourcing issue was still to be adequately addressed despite repeated calls and representations made in this regard.

At the same time, respondents indicated that the inspectorate was making good use of its available resources to conduct both proactive and reactive visits and to pursue long-term improvements in both safety and regulatory compliance. In other words, the shortfall was neither uniform to all workplaces nor the result of suboptimal strategic choices. Further, while the training and approach of inspectors was generally supported (this issue is explored in more detail in the next section of the audit) a significant number of respondents, indeed an overwhelming majority, pointed to a need for more inspectors with mine engineering qualifications or coal mining expertise to deal with both current operational issues and long term succession planning. Several interviewees made point that currently no inspector has training or knowledge of the specific hazards associated with coal mining.

The absence of succession planning was raised repeatedly. This operates at two levels. First, the failure to replace inspectors in practice until their predecessor has left means there is no opportunity for the latter to mentor them. Typically one of the

induction/training practices adopted is for the new appointee to accompany a more experienced inspector in their tasks in order to get familiarity and confidence. They can be introduced to the worksites they will visit and the staff at these as well as acquiring information and experiences from the previous inspector that will give them both important contextual/historical information as well as assisting them to 'get up to speed' more quickly. The departure of two inspectors means any mentoring falls to inspectors already overloaded as a result of the departures (it also means the particular skills of those departing inspectors, for example with regard to machinery, are lost). Second, the departure of older and more experienced inspectors leads to a knowledge loss, especially with regard to senior positions like the Chief Inspector of Mines which have longer term effects than the first problem. One way of dealing with the later problem in particular is to bring the retired inspector back on short-term contract to provide advice and help steer the changeover. I am aware this has been done successfully in another area of WorkSafe Tasmania. However, this relies on the person being agreeable. So while this measure may be used it is critical that new appointment policies allow wherever possible for a change over process where mentoring can occur and also that thought is given to longer term succession planning within OCIM to avoid the dislocation of the retirement of senior staff. Discussions between the Chief Inspector of Mines and the General Manager would be valuable in this regard.

In my view, the consensus amongst a spectrum of interest groups as to the inadequacy of the current establishment should carry substantial weight. Calls to change the composition of the current inspectorate to include more mining expertise also warrants attention especially as reinforces other evidence examined below.

Their views are also consistent with my own observations. At present due to the departures already referred to there will soon be only three inspectors. Further, one of the remaining inspectors has additional responsibilities that limit their capacity to undertake inspections. The Chief Inspector of Mines, like his counterparts in other jurisdictions, has important administrative and oversight tasks. This includes being a point of review for critical decisions, providing expert advice on regulatory developments (such as the national harmonisation of mine safety legislation) and important statutory obligations. Issues arising from the national harmonisation of the mine safety regulatory framework and dealing with deficiencies in the current regulatory framework (discussed later in this audit) are of themselves likely to demand a considerable amount of the Chief Inspector's time in the next 12 months.

In combination with other factors (like annual leave or attendance at industry conferences) this means that, even ignoring the current vacancies, only one mine-engineering qualified inspector is available on a full-time basis to carry out regular inspections and those mine visits arising from incidents as well as the necessary administrative and follow-up work associated with these activities. The Chief Inspector does conduct field inspections, periodically partnering the other inspector when reviewing the highly technical issues of a mine such as ground control and seismicity. This is important and valuable.
The existing staffing situation impacts on the Chief Inspector of Mines in other ways. The Chief Inspector of Mines of the various Australian states and New Zealand meet on an annual basis. This provides an important avenue to exchange knowledge with regard to emerging trends or hazards as well as a range of other matters like new

regulatory requirements, common difficulties in inspection, investigation methods and enforcement strategies. The personal links built at these meetings also facilitate more rapid exchanges of information and advice at other times. In both the 2010 and 2012 audit the Chief Inspector of Mines indicated he felt unable to attend these meetings. In the current audit he indicated he would be attending the next meeting. In my view regular attendance at these meetings is especially vital for a small inspectorate like Tasmania because of the potential benefits to be gained from interaction with the heads of larger and better resourced inspectorates dealing with a greater number and diversity of mining operations.

Further, as a small unit the mine inspectorate's capacity for routine operations can be severely impacted by serious incidents. This was well evidenced by the three rockfall related fatalities at the Renison mine (in two separate incidents that occurred in 2001 and 2003) where the investigation and coronial inquest took up a considerable amount of the Chief Inspector of Mines time. This situation had recurred at the time of the current audit following three deaths in two separate recent incidents at Copper Mines of Tasmania (CMT) . In response to one of these fatalities (due to mud rush) the Chief Mines Inspector has issued a notice suspending operations until the issue can be addressed (a similar suspension was imposed on the Beaconsfield mine following the fatal rockfall in 2006). Oversight of such notices is a significant activity. Fatality investigations are also demanding and time-consuming, especially in underground mining where they can involve complex technical, engineering or design issues (as is the case with at least one of the fatalities currently under investigation at CMT). Currently, both engineers are fully occupied in the investigations surrounding the two recent fatal events, which with associated regulatory processes (including coronial inquests), will continue to make demands on their time over an extended period. This has negatively impacted on capacity to undertake proactive inspections. A later section of this audit report examines a proposal to reduce the investigative load on mine inspectors.

Leaving the last point to one side it needs to be emphasised that mining is a high hazard industry requiring a greater degree of regulatory oversight. Mining is one of four industry sectors (the others are construction, road transport, and agriculture/farming/fishing and forestry) which together account for over 70% of all work-related fatal injuries in Australia. The recent fatalities in Tasmania are a cause for concern, and indeed, they were included with five fatal incidents in other states that had occurred in the past six months in a cautionary statement by the Queensland Commissioner for Mine Safety and Health, Stewart Bell. Commissioner Bell warned this was an alarming trend for the current year (2013-14) especially as five of the seven fatal incidents (including one in Tasmania) involved contract workers (cited in *SIA Professional eNews*, Issue 209, 4 March 2014).

Finally but not least, the absence of coal mining expertise within the inspectorate is particularly disturbing. This needs to be addressed to ensure that the management and workers in coal mines get the advice, oversight and support to ensure compliance with current legislation and to minimise the risk of a serious incident. My previous involvement in fatal mine incidents indicates that should this situation not be rectified and a serious incident occur then both WorkSafe Tasmania and the government of the day are liable to come in for sharp criticism from the media, community and any independent investigation.

Apart from the question of mine specific qualifications just dealt with most interviews saw the training levels/skill-sets of existing inspectors as adequate for the task. Areas where some additional training could occur included investigation skills which I think merits serious consideration. Clearly, any new appointees to OCIM will require G3 risk assessment training if they do not already possess this (or equivalent training) and this audit also recommends that training in mine auditing (as occurs in other jurisdictions like Queensland) is also required for at least two inspectors. Periodic if not regular attendance at mine safety conferences like those run in Western Australia or NSW is also important in terms of updating knowledge. Further, as raised in earlier audits engineering qualified inspectors in a small jurisdiction like Tasmania would benefit enormously from the opportunity to visit another jurisdiction with a larger mine inspectorate in order to observe inspection practices there and discuss both challenging issues and recent initiatives in terms of mine safety. I recommend that a visit of at least one week's duration should be available on a two yearly basis for both metalliferous mine inspectors and any future appointments (including a relevance exposure to coal mining inspection practices).

2. Benchmarking against evidence of the resourcing of operational activities in other Australian jurisdictions

Second, observations about the adequacy of current resourcing were also informed by comparative observations with Queensland. In late 2013 I examined the inspection records relating six coal mines (both underground and open cut) in Queensland over a 20 year time frame (1990-2013). This amounted to over 400 reports prepared by Queensland mine inspectors. Several, points pertinent to the current audit emerged. One was that degree of regulatory oversight increased markedly in both frequency and detail following the introduction of revised coal mining legislation in 1999. As part of this audit I found that regular inspections of the Cornwall Colliery occurred on a three monthly basis with additional visits occurring in response to any significant issues or high potential incidents. While at first glance this may appear broadly comparable to what occurs in Queensland in the latter additional inspections occur on a regular basis, especially with regard to underground coal mines. These are inspections carried out by specialist machinery and electrical inspectors as well as periodic detailed audits of particular aspects of mine safety management (for example particular types of equipment, maintenance regimes or hazard management plans). This enables inspectors to flag warnings about deteriorations in systems, upgrade systems or communicate the importance of both reporting and thoroughly investigating particular incidents. On a number of occasions these interventions were, in my opinion, critical in avoiding a serious incident. Further, these activities are all carried out by inspectors with formal mining qualifications, expertise and experience, including specialist mine machinery and electrical qualifications and knowledge.

The difference is reinforced when the situation in NSW is considered. Underground coal mines are inspected four times for each shift per annum which is equivalent to one inspection per month while underground metalliferous mines are inspected two times per shift which equates to inspections every two months. Open cut coal mines are inspected on a quarterly basis. As in Queensland this activity includes a level of detailed auditing well above what currently occurs in Tasmania. Overall, despite

slight differences in approach the level of contact in Queensland and NSW and exceeds what OCIM could achieve with its current resources.

As a small inspectorate Tasmania is unable to engage specialist machinery and electrical inspectors like Queensland. It did have an inspector with considerable knowledge of machinery but they have recently retired. It has a formal call on one third of the time of an electrical inspector located in another part of WorkSafe Tasmania. As noted in previous audits Tasmania lacks specialist geotechnical expertise. In relation to this, the inspectorate has periodically drawn on specialist support from expert consultants as is currently the case with the mud-rush fatality investigation at CMT. This seems appropriate given the episodic nature of such demands.

While mine inspectors do their best to carry out both proactive and reactive tasks in the same way as their counterparts in Queensland the current level of resourcing does not in my view permit a comparable level of oversight. This point is entirely consistent with comments made by interviewees. For example, it was argued that Tasmania required seven not six inspectors with the seventh specialising in carrying out regular detailed audits of the safety management systems.

3. Benchmarking inspectorate numbers and qualifications with another small jurisdiction (New Zealand)

In order to obtain further insights into what is an appropriate level of staffing and qualifications for the Tasmanian mines inspectorate I sought and obtained information on the resourcing of the mines inspectorate in New Zealand. I already had some knowledge of this from my involvement with the Pike River Expert Reference Group but also contacted the Chief Mines Inspector in New Zealand who kindly provided additional information. Reasons why New Zealand constitutes a good comparator for benchmarking resourcing with Tasmania were identified earlier in this report. Like Tasmania (and unlike NSW, Queensland and Western Australia) it has a relatively small mining industry (though like Tasmania important to its economy) which includes both underground coal and metalliferous mining. The other two Australian states (Victoria and South Australia) are really comparable in this regard. If anything the New Zealand mining industry is somewhat smaller than Tasmania. Although it has a greater number of coal mines and resourcing has clearly been significantly influenced by the Pike River mine disaster I do not think this invalidates the comparison. Tasmania has one underground coal mine at least comparable in size to those in New Zealand and the option of establishing a second mine in the same region has been under consideration for several years. Tasmania also has two very long established metalliferous mines, both of which have experienced a number of fatalities since 2001. Further, while Tasmania has not experienced a serious multiple fatality incident (ie causing four or more deaths) for many years this doesn't mean this risk can been ignored or minimised. At least two incidents since 2006 could have involved more fatalities with a relatively small change of circumstances.

As already noted at present Tasmania has five mine inspectors on establishment, including the Chief Mines Inspector, two of whom have specialist qualifications in mine engineering. By way of comparison, New Zealand has the same number of mine inspectors (including the Chief Mines Inspector). However, unlike Tasmania all these

inspectors have engineering qualifications and/or the requisite competencies to manage a coal or metalliferous mine. Further, unlike Tasmania these mine inspectors are not required to oversee quarries. The issue of coverage of quarries was discussed extensively within the New Zealand government following Pike River. A decision was made not to follow Australian practice of including quarries in with mining (one of very few deviations from the Australian approach) but that given the hazardous nature of the activity and its neglect in the past to develop a new regulatory package (code) dealing with quarrying.[5] Further, it was decided that quarrying required dedicated inspectors. The New Zealand government is in the process of appointing three additional inspectors with the sole responsibility of enforcing health and safety legislation with regard to quarries. While this audit, unlike that undertaken in 2012, did not explore regulatory oversight of quarrying in Tasmania in depth the evidence collected indicated that the shortfall in inspection activity identified in the 2012 audit had not been addressed and, indeed, the situation may have deteriorated due to competing demands with regard to mines and mineral processing.

In sum, the resourcing of the Tasmanian mines inspectorate compares unfavourably with that found in New Zealand both in terms of the number of inspectors and the level of qualifications relevant to the inspection of mines. At the time of the Pike River mine disaster there were only two mine inspectors in New Zealand – a situation identical to the one found in Tasmania at the time of the fatal rockfall at the Beaconsfield gold mine in 2006. In both cases mine inspectorate numbers were increased following the incidents though New Zealand has acted more decisively in terms of the number of inspectors, their qualifications and the timeline for achieving this. While the scale of the Pike River disaster and the trauma it caused the New Zealand community help to explain this, the comparison still raises serious concerns about the adequacy of inspectorate resourcing in Tasmania. What is also clear from the New Zealand experience is that the government there was able to appoint suitably qualified mine inspectors within a relatively short period. This suggests that notwithstanding competition from the big mining states in Australia a small jurisdiction can still secure an adequate number of suitably qualified mine inspectors. The question why this hasn't been achieved in Tasmania and how to rectify this situation is dealt with in a later section of this audit.

Is the overall size and composition appropriate for current and foreseeable demands?

Drawing the foregoing evidence together this audit makes the following findings.

1. Notwithstanding the closure of mining operations at Beaconsfield the current establishment of five inspectors is inadequate and as recommended by previous audits an additional inspector needs to be appointed with primary responsibility for quarrying.
2. The qualifications composition of the current establishment is not adequate for the tasks it is required to undertake and not comparable to that found when benchmarked against another small mining jurisdiction namely New Zealand. To rectify this, the two posts which are vacant at the moment should be filled

[5] It is is worth noting that no support was expressed for excising quarries from coverage of OCIM. Rather the interviewees to comment on this issue, including an industry representative, pointed to synergies/advantages of the current approach.

by applicants with mine engineering qualifications, one with specialist knowledge of coal mining and one with specialist knowledge of metalliferous mining. With regard to the latter applicants who have the qualifications and experience to manage a metalliferous mine might also be considered.

3. Engineering qualified mine inspectors need an opportunity to upgrade their skill set periodically and to gain insights into practices and developments in larger jurisdictions. The Chief Inspector of Mines should attend the annual meeting of Chief Mine Inspectors of Australia and New Zealand as a matter of course for the reasons already identified in this report.
4. If the interregnum prior to the appointment of a qualified coal mine inspector is more than six months, an inspection by a qualified coal mine inspector from another jurisdiction (or a suitably qualified and experienced equivalent like David Reece) should be organised.
5. Provision should be made for specialist expertise (notably geotechnical expertise) to be brought in on a consulting basis as required.
6. The additional training needs identified in this section, including those with regard to auditing, should be addressed
7. The adequacy of current arrangements with regard to electrical inspection should be reviewed.

ORGANISATIONAL STRUCTURE, BUDGET AND OPERATIONAL ISSUES

Organisational Structure and Budget

Under the present organisational structure the Office of the Chief Inspector of Mines (OCIM) is a unit within WorkSafe Tasmania. As already indicated, mine inspectors are responsible for mining, mineral processing and quarrying – coverage similar to other mining inspectorates in Australia. The Chief Inspector of Mines also has responsibility for major hazard facilities which includes a small number of inspectors not considered in this report. While this places an additional administrative load on the Chief Inspector of Mines the arrangement makes sense on several grounds. First, a number of mines and mineral processing operations include major hazard facilities (principally in terms of the storage and use of large amounts of toxic materials). Second, this organisational arrangement has also been used by a number of other smaller inspectorates (including South Australia and New Zealand).

Mine inspectors are based in two locations. The Chief Mines Inspector and one other inspector are located in the main office of WorkSafe Tasmania in Rosny (a suburb of Hobart) while the three remaining inspectors (including the current and impending vacancies) are located at the Burnie office. While locating all inspectors within a single office might seem attractive, especially in a geographically small state like Tasmania, I think the present distribution makes sense on a number of grounds. First, there are advantages in basing the Chief Mines Inspector in the main office of WorkSafe Tasmania where he can have ready contact with the Compliance Director and General Manager, and where he is also close to the state legislative and parliamentary apparatus (to respond to queries and the like). This approach applies in at least two other jurisdictions I am familiar with for much the same reasons as the ones just outlined. Locating another inspector in the Rosny/Hobart office also seems to make sense given its close proximity to a major mineral processing plant (Nyrstar).

Locating the other mine inspectors at the Burnie office also makes sense as it gives them more ready access to the West Coast mines than would be possible from Hobart while also being able to reach the coal mine located in the Fingal Valley south east of Launceston. The closure of the Beaconsfield mine (notwithstanding some ongoing mineral processing activity there) further justifies this breakdown although Launceston would be a more proximate location for a coal mining inspector recommended by this audit as it is a lot closer to the Fingal Valley. As far as I could judge information flows between inspectors in the Burnie and Rosny office are effective. Should an additional inspector be appointed with primary responsibility for quarrying activities (as recommended elsewhere in this audit) consideration will need to be given to their location given that quarries are found throughout the state, those most within a relatively short drive of either Hobart or Launceston. The suggestion was made that an inspector based in Launceston would have ready access to the quarries and processing facilities located near there.

Clearly, budget issues can have a significant influence on available resources and operational effectiveness. Given the scope and resourcing of this audit the capacity to undertake a detailed analysis of the budget was limited. Attention therefore focused on whether a budget framework has been established to support a sustainable and effective mine safety enforcement regime and whether there were any serious

budgetary constraints on the OCIM that impinged on its base structure and operational effectiveness. Issues explored in this regard included the sustainability of the budget and coverage of key areas of activity such as staff recruitment/retention, training/skill maintenance and operational activity. Each of these aspects will be dealt with in turn.

Table 1: Office of the Chief Inspector of Mines Budget/Expenditure Information

Year	Budget	Actual Expenditure	Variation
2009-10			
Salaries	828,851	867,460	
Non-salaries	172,212	203,871	
Total	1,001,063	1,071,331	(70,268)
2010-2011			
Salaries	988,338	912,157	
Non-salaries	164,314	214,561	
Total	1,152,652	1,126,718	25,934
2011-2012			
Salaries	1,059,077	981,632	
Non-salaries	173,045	200,755	
Total	1,232,122	1,182,237	49,734
2012-13			
Salaries	1,071,381	1,153,646	
Non-salaries	80,477	82,573	
Total	1,151,858	1,236,219	(84,360)
2013-14 (to Feb)			
Salaries	979,308	893,632	
Non-salaries	47,139	26,207	
Total	1,026,447	919,839	

Table 1 provides a summary of overall budget allocations to the Office of Chief Inspector of Mines between 2009-10 and 2013-14 (to Feb 2014).Like other public sector agencies the great bulk of this expenditure is the payment of salaries to staff within the OCIM (this includes payment to two major hazard facilities inspectors). As noted in the 2010 audit the budget was increased substantially after 2006. However, as the 2012 audit noted this growth slowed after 2009-10 and actually fell after 2011-2012. Discussion with the Chief Inspector of Mines identified two factors impacting on the OCIM non-salaries budget in recent years namely the centralisation of the training and vehicle budget items and the flow on of budget constraints on WorkSafe Tasmania (although OCIM has fared better than other units within WorkSafe Tasmania). Unlike previous audits access to training and travel costs did not appear to be issues, which is positive. Recommendations relating to the Chief Inspector of Mines attendance at the annual meeting of Chief Mine Inspectors of Australia and New Zealand, conference attendance, G3 risk assessment training for newly appointed inspectors (where required), mine audit training, and the periodic visits to interstate inspectorates would need to be included in future budget calculations.

My discussions with a number of parties indicated that WorkSafe Tasmania has endeavoured to maintain a near constant level of funding, including providing salary packages at least sufficient to retain existing staff. A number of industry and other stakeholders interviewed argued the OCIM required more resourcing, such as increases in the car pool so inspectors could rapidly travel to work sites as and when required. A related issue was accessing vehicles in a locked car park after hours if there was an emergency call-out, something that could probably be easily attended to. The two engineering qualified inspectors who are most likely to be called out to a serious mine incident have access to home-garaged vehicles and this should be extended to the new qualified appointments recommended in this report. Vehicle access arrangements with regard to other inspectors could be reviewed.
In general, administrative and logistical support was not raised as an issue of serious concern. The 2012 audit devoted considerable attention to the electronic data collection and retrieval system used by WorkSafe Tasmania (TRIM). There was some criticism of the record keeping system at WorkSafe as both complicated and sometimes out of date. TRIM, however, was seen as a good system though somewhat under-utilised. A suggestion was made that online access to information in the field (especially remote locations) could be improved.

Notwithstanding these efforts, like the two previous audits this audit identified two problems that are yet to be resolved. First, in order to be operationally effective the OCIM requires a predictable and sustainable level of funding. This includes funding to cover six inspectors, four of whom should have the engineering qualifications and experience of managing a mining operation (see earlier section of this audit) along with adequate support to carry out their tasks effectively (vehicles, computers, ability to update their skills etc). The present funding level does not permit this. Second, related to the last point the current arrangements for remunerating mine inspectors are essentially ad hoc. Currently the two engineering qualified mine inspectors are paid on a 5 year contract basis according to widely different SES salary scales while the other three inspectors (one since retired and another about to leave) were paid through the State award, rates, much lower than that paid to the engineering qualified mine inspectors. Repeated attempts since 2003 to recruit inspectors with mining experience through this salary structure have been unsuccessful.

How salary packages are determined is a matter for government. This audit is only concerned with current arrangements in so far as they impact on recruitment/retention and other dimensions of operational effectiveness. In this regard the following observations can be made. The contract SES arrangement was an effort to make the salaries of engineering qualified mine inspectors more competitive (if still somewhat below) those paid in the mainland mining states. Without this recruitment would have been almost impossible given the level of demand interstate and the mining boom generally. While the level of mining activity has tapered off, making recruitment easier, Tasmania will still need to offer reasonably competitive packages. The SES contract is not the best vehicle in this regard at least with regard to non-managerial inspectors. The limited tenure may discourage the best applicants especially those with mine management experience/credentials or those that need to relocate to Tasmania. Nor is it a scheme used to engage mine inspectors in the other mining jurisdictions I am familiar with. Further, the timing of contract renewal for different appointments can lead to disparity in salary packages that do not reflect respective

workloads, experience, responsibilities etc. This can have retention effects as well as adversely impacting on morale. The uncertainty and perceived inconsistency of salary packages of non-engineering qualified mine inspectors can also impact on morale and make recruitment/retention more difficult. In a small unit morale is especially important given close working relationships. It also needs to be recognised that, unlike larger organisations, there are very limited prospects for career advancement which can also affect both morale and retention. The recommendations regarding salary are framed with all these considerations in mind, though particularly the recruitment/retention of suitably qualified and able personnel.

While I think that mine inspectors are highly motivated and committed and interpersonal working relationships are excellent the problem just identified could be fairly easily addressed, and in a way that addresses recruitment/retention issues. This would be to establish a distinct mine inspector scale within WorkSafe Tasmania with two levels, one for engineering qualified mine inspectors with experience in mine management and the other for those without these qualifications but with experience in safety management, preferably in mining. These scales should reflect a payment level significantly above the current effective pay levels for the latter group around the range $120,000 - $130,000 or somewhat higher depending on mine experience. At this level, OCIM would be able to appoint non-engineering qualified mine inspectors who nonetheless had considerable experience with regard to safety management in mining. The salary level of the second tier of engineering qualified inspectors with mine management experience would be higher, commencing around $190,000 per annum (with a range to reflect experience). In any case both these salary levels should be determined (and updated) via benchmarking with other mine inspectorates (perhaps with a small discount to reflect lifestyle advantages Tasmania offers). The salary levels won't match the private sector but would be at a level where attracting and retaining quality applicants can be realised. Only through this measure can Tasmania overcome previous problems and secure and retain an adequate complement of suitably qualified and experienced mine inspectors. This is not just my judgement. It the need to adjust salary levels to resolve recruitment/retention issues was made repeatedly to me in interviews, not least by industry representatives.

The distinctive salary scale would also more closely align the practice of other mine inspectorates I am familiar with. The engineering scale should include an additional payment for the Chief Inspector of Mines to reflect their additional responsibilities and managerial role or on an SES contract where determination was aligned to these principles. Again, benchmarking against the practice in other jurisdictions (ie those with small mine inspectorates) should be undertaken to ensure some level of comparability. This approach would provide a stable platform that would attract high quality local and overseas applicants. Further, the issue is not simply one of markets and internal consistency (and however much it may be imagined to the contrary like others inspectors obtain and assiduously compare their pay to others doing comparable work). The separate scale would also be reflective of the particular demands of inspection in a high hazard and technical challenging context which is mining.

It needs to be stressed that this is not a new issue. The need for an appropriate salary scale was identified by the independent investigation into the Beaconsfield gold mine Anzac Day fatality. I have raised the issue in my previous audits (2010 and 2012). It

should also be noted that after Beaconsfield efforts to hire new inspectors proved difficult and only one inspector with engineering qualifications and mining expertise/experience has been hired (and then only under a special salary arrangement). This situation is more than likely to continue into the future notwithstanding the recent tapering off of mining activity in Australia unless the salary scale issue is addressed. This would in turn inhibit the capacity to fulfil recommendations relating to future appointments made elsewhere in this report. On the other hand, the introduction of a salary scale with some level of comparability would enable Tasmania to exploit the current circumstances to make well-credentialed appointments from the local and overseas pool of potential applicants.

It should also be noted that concerns about salary levels and sustainable funding were common themes in interviews conducted with mine managers, industry representatives, unions and others for this audit. Interviewees referred to inequitable and non-competitive salaries as reflecting the underfunding of the mine inspectorate – a level of expenditure that made it very difficult if not impossible to attract the types of job applicants needed and also in no way matching the economic importance of the industry to Tasmania. Salary was seen as particularly important given the limited career promotion prospects for highly specialised inspectors within a small unit, especially when compared to the greater prospects for career advancement in the private sector. The point was reinforced by comparisons with the recruitment experiences of other states where salary levels had been made more attractive. Previous audits indicated that the mining industry had made its views known about the inadequate level of funding of OCIM and interviews for this audit suggested a degree of frustration the matter was yet to be resolved.

Returning to the broader issue of sustainable funding a number of observations need to be raised. The uncertainty associated with recurring budgetary pressures on government agencies, including WorkSafe Tasmania, are not conducive to a planned and strategic approach to maintaining safety standards in a high hazard industry. The last section of this report identified staffing requirements (in terms of numbers and qualifications as well as specific areas of expertise like coal mining) which of themselves require a larger and more sustainable budget. The operational requirements of an effective inspectorate in a high hazard industry like mining, mineral processing and quarries also presume a sustainable level of funding so that, in addition to regular inspections and reactive activities (for example responding to an incident or query) the inspectorate can engage in more proactive functions. The latter include detailed auditing of safety management systems (both desktop and direct inspection) and long term campaigns and targeted activities to address major hazards through research, promoting awareness and education, targeted visits and selective enforcement. It should also be noted that mining and mineral processing are commonly 24/7 operations or entail shifts that do not coincide with standard working times (this is evident in the timing of a number of fatal incidents in Tasmania). This places additional demands on a small inspectorate that must rapidly respond to incidents or issues at remote locations. As the next section will show, while OCIM has made some commendable efforts to be proactive and take a long-term and strategic approach to addressing serious hazards it lacks the resources to achieve an optimal level of activity in this regard.

WorkSafe Tasmania has made efforts to insulate OCIM as far as possible from budget shortfalls but, viewed in the context of budget/staff cuts described in the 2012 audit, it seems extremely doubtful that the agency has the resources to fund OCIM at a sustainable and appropriate level. It should be noted in passing that, in addition to mining, WorkSafe Tasmania has responsibilities for other high hazard industries including construction, fishing and forestry. Previous audits identified two options to resolve this problem. First, the imposition of a levy on the industry to fund OCIM – an approach that has been used with regard to several mine inspectorates on the mainland. While such a levy would not be universally popular both the 2010 and this audit found industry representatives want the OCIM to be adequately funded and several indicated they would accept this approach if it was the only way this outcome could be secured. Second, another option is allocating a set fraction of mining royalties to cover the costs of the OCIM. The 2012 audit showed that the amount required would only represent a small proportion of annual total royalty receipts. Needless to say this option was more popular with industry because it entailed no additional costs on them. This audit strongly recommends that the OCIM budget be placed on a more sustainable footing by adopting one of these two approaches.

Operations

In auditing the OCIM it was critical to consider operational issues in order to assess the array of tasks it had to undertake, if it was making effective use of its available resources and were there shortfalls/gaps in activity that needed to be addressed? It must, by necessity, also include some consideration of the regulatory framework introduced in 2011 in response to the Beaconsfield et al incidents and as well as changes to work health and safety laws as part of the federally-initiated harmonisation of OHS legislation. Unlike some other states (like Queensland and Western Australia) since 1995 Tasmania has regulated mines under its general OHS legislation (the Work Health and Safety Act) – the model also followed in New Zealand. Until 2011 there was, indeed, no mine specific legislation or regulation in Tasmania. The independent investigation into the 2006 Beaconsfield fatality and several coronial inquests were critical of this approach and in 2011 additional mine-specific regulatory requirements were introduced to fill several notable gaps (for example with regard to the reporting of serious incidents, requiring management systems and clarifying the role of responsible officer). However, these measures still fell short of regulatory requirements in other jurisdictions like New South Wales, Queensland and more recently New Zealand. Moreover, these requirements were affected when Tasmania adopted the federal model OHS laws, and not in an entirely positive way since the model legislation was never fully designed to regulate mining (there was a separate process to harmonise mine safety laws federally).

As in 2012, assessment of the operations of the mine inspectorate drew on interview material (both with inspectors and others like industry representatives, managers and union officials), direct observation of a mine inspector undertaking a mine inspection, and some associated documentation. The workplace visit provided significantly enhanced information on inspectorate activities and some impressions to as to their effectiveness. Worksite visits also provide an opportunity to speak to managers, supervisors and workers, to observe the worksite itself and obtain information about the state of safety and safety systems in operation. In 2012 I undertook a number of work site visits but for the purpose of the 2014 audit I was only able to undertake one.

As indicated in 2012 more detailed examination of activities (notices, notifiable incidents, correspondence and visits recorded in TRIM files would be a valuable addition to a future audit. Leaving this point to one side in the course of my visits and interviews I sought to identify changes that had occurred since the last audit (and more generally since 2006) in terms of inspectorate activity, in terms of OHS management, and in terms of the relationship between the two.

Before proceeding to discuss my findings a number of preliminary observations need to be made. As a high hazard industry mining inspectors need to devote considerable attention to those hazards that lead to death and serious injury. In mining there are eight mechanisms which have caused the death of mineworkers – most over many hundreds of years – namely:

- Fire/explosion
- Outburst/asphyxiation
- Falls from height
- Machinery (including vehicle collisions and pedestrian incidents)
- Entrapment
- Falls of ground
- Inrush/inundation by water, mud or muck (this can also include the failure of tailings dams in open cut mines)
- Electrocution

Tasmania has experienced fatal mine incidents involving most of these mechanisms at some time with more recent fatalities being due to falls of ground, falls from height and inrush/inundation. Virtually all were identified as requiring careful attention (including the need to plan for changes in operations that were likely to have implications in this regard) by industry representatives and others during interviews for this audit. Almost all these mechanisms/hazards have been the source of mass fatality incidents in mining though fire/explosion, falls of ground and inrush/inundation are the most typical cause of mine disasters. The vast majority of mass fatality incidents have occurred in underground mines (though workshop fires, catastrophic machinery failure, falls from height involving vehicles and failure of tailing dams could result in multiple fatalities in open cut mines). Fires/explosions are a major hazard in metalliferous mines but an arguably even more critical issue in coal mines because what is being mined is flammable (and made spontaneously combust), the methane gas associated with mining is explosive and coal dust is inflammable. Explosive gases like methane can collect in faults or in abandoned workings and the softer/organic nature of the material being mined also raised different challenges in terms of ground support to hard rock metalliferous mining. It is worth noting in passing that over half of the eight mechanisms/hazards also apply to mineral processing and quarries though multiple fatalities are much less common.

In addition to these hazards mine inspectors must also ensure regulatory standards are maintained with regard to an array of other hazards including long hours/fatigue, slips and trips, ergonomics/manual handling, fitness for work (including alcohol and other drug use) and psychosocial hazards. Mining, mineral processing and quarries also involved exposure to potential health damaging substances like highly toxic chemicals using mineral processing, stone dust (in the case of mining and quarrying) and coal dust (in the case of coal mining). Exposure to stone and coal dust has been responsible

for serious lung diseases (silicosis and pneumoconiosis respectively). Diesel is now classed as a carcinogen and diesel fumes are a particular problem in the confined spaces of underground mines (see Stewart et al, 2012).

In sum, as a high hazard industry which experiences a disproportionate number of fatalities the OCIM must carefully scrutinise compliance with regard to the eight well-known sources of single and multiple fatalities. They must also cover a wide array of hazards found in many other workplaces as well as some potentially significant health hazards which are either specific to mining (like coal dust) or of greater concern in the confined work environments of mining (like diesel fumes). Finally, mines like other workplaces undergo change and changes to work practices, including the use of contractors can alter the level of risk (see Blank et al, 1995; Buessing and Weil, 2013; Karra, 2005; and Muzzaffar et al, 2013). In short, it is a very demanding job.

The remainder of this section will deal with several critical aspects of operational effectiveness

Inspection processes and compliance strategies

In order to provide effective regulatory oversight an inspectorate needs to carry out detailed routine inspections, to react rapidly (and with adequate follow-up) to incidents, queries or complaints relating to particular worksites, and to undertake targeted audits/campaigns to address systemic problems and lift compliance standards over time. Integral to this are a range of other activities including

- research/keeping up to date with knowledge of hazards and their remedies as well as (occasionally) seeking information from other inspectorates;
- reviewing notifiable incidents and 'near miss' reports to identify issues or trends;
- tracking the history and compliance record of particular workplaces; communicating information on new or emerging hazards to worksites
- writing inspection reports, notices and other correspondence
- providing advice and responses to queries from worksites, the community and government
- liaising with other inspectors regarding current and future activities
- the application of remedies most likely to secure compliance at individual workplaces and more generally

The inspectorate also requires a systematic compliance strategy that is consistently applied[6] and also directed to achieving OHS improvements over time. The balancing of routine and proactive inspection activities with reactive activities is critical. Overall, many OHS regulators have sought to move towards a greater emphasis on proactive inspection activities - not just routine 'working the beat' visits but inspections targeted in terms of the workplace and issues (Walters et al, 2011). This approach is seen as a more resource-effective way of enforcing legislative standards and lifting safety standards over time. Ideally, it will also reduce requirements for

[6] In practice this doesn't mean all breaches will be detected but that there is a good prospect serious breaches will be detected and those that are detected are dealt with in a consistent fashion given the nature of the breach and the past record of the workplace in terms of compliance.

reactive visits by pre-empting problems from arising or escalating. Having said this, reactive inspections will still be required and the capacity of inspectorates to achieve a more desirable balance between proactive and reactive inspections has been constrained by resource limitations (Walters et al, 2011). Resource constraints can also affect the amount of time available for inspections and consequently the level of detail/quality of inspections and the degree of follow-up to ensure problems identified were rectified (Walter et al, 2011). In high hazard workplaces like mines and mineral processing facilities (and major hazard facilities if not quarries too) regular routine visits are essential to monitor compliance with legislative standards and evaluate safety systems. This needs to occur alongside a rapid and rigorous response to any notifiable incident or concerning trend in 'near misses' as well as more proactive inspections connected to targeted audits or campaigns. A routine inspection of a major hazard facility (like those I have accompanied inspectors on in other jurisdictions) can typically involve two days on site – one day spent checking the paperwork/documentation of safety systems (ie a desktop audit) followed by another day of physical inspection to ensure the systems are actually being implemented. Similar detailed examination of inspector records relating to six Queensland coal mines (both underground and open cut) over a 20 year period indicated that mines were subject to a succession of regular inspections by mine, electrical and machinery inspectors together with periodic detailed audits of systems (major hazard management plans, safe operating procedures or TARPs) or particular facilities (like workshops or plant) which involved both desktop and physical examination.[7] Further, the Queensland inspectorate was particularly active in responding to incidents, critically reviewing incident investigations, evaluating trends and ensuring all notifiable incidents are reported (failure to do this is treated as a very serious regulatory breach).

Typically, a routine visit will involve discussions with management/supervisors (and perhaps a worker representative) followed by a physical inspection (including discussion with supervisors and workers), review of requests for documentation, and follow-up. Given the large amount of documentation (including overarching safety systems and major hazard management plans, risk assessments undertaken, safe operating procedures, trigger action response protocols [TARPs], emergency procedures, incident investigation reports, incident/near miss records, pre-shift start notices, maintenance and hazardous substance records, safety alerts, incident reporting procedures and records relating to safety committee meetings) routine visits normally only focus on a selection. Ideally documentary review is rotated over time to ensure coverage (the audit was unable to review whether this occurs in systematic fashion but recommends this should be done) as well as responding to incidents and trends demanding priority attention.

Routine inspections should also include periodic observation of significant processes in order to better gauge the safety system, including attending pre-start or shift changeover meetings. The latter clearly entails implications in terms of the timing and length of visits as does having sufficient time to speak with workers and supervisors engaged in safety-critical tasks to gauge their knowledge, the adequacy of procedures and to identify and issues of concern. As noted in an earlier section of this report, in

[7] The absence of a qualified coal mine inspector in Tasmania for many years has been noted elsewhere in the report.

some other jurisdictions, inspections are staggered to coincide with particular shifts so that all shifts are inspected.

To this must be added travel time getting to and from the site. With regard to mines in Tasmania travel times to and from mines commonly total between three and six hours, meaning actual inspection time might be just over half a day unless overnight accommodation has been arranged. All but one of the mine and mineral processing plant inspections I undertook in 2012 and 2014 took about a day including travel time. Being part of a routine series of visits the physical inspection tended to focus on some areas or issues at the workplace, and particularly those eight hazards responsible for fatalities (like ground support, fire/explosion and inrush). Regular visits enable the inspector to concentrate on particular areas during visits, to 'drill-down' into the underlying systems and structures, form an overall opinion on how the site was being managed and identify limitations, major structural changes requiring attention or emerging issues that needed to be addressed. While interviewees believed that inspectors spent sufficient time on site several argued that inspection times were inadequate, attributing this to resource limitations. Concern about inspection time, especially due to the constraints imposed by the amount of time travelling, was also raised within the inspectorate.

Travel time is also an issue with regard to quarries. While many quarries are located relatively close to Hobart and Launceston the dispersed population of Tasmania means others would require time to reach by inspectors located in any of the three existing WorkSafe Tasmania offices. As many quarries are relatively small the issue is less about having adequate time to inspect the quarry but the time spent getting to and from remotely located quarries, even if efforts are made to inspect several quarries during one trip.

As in 2012 I found the routine inspection I observed was professionally conducted in what I would expect of an experienced and effective inspection (and I have directly observed more than 100 inspections covering a range of industries across Australia). This included detailed discussion with management about systems in place and a recent incident, discussion with supervisors, worker representatives and workers on-site, inspection of the mine to review safety conditions (ground support, fire suppression and lifelines) as well as the site of the incident, and follow up activities including requests for further information. Further, as in previous visits this positive impression was reinforced by private discussions with management when the inspector was not present.

In high hazard workplaces carefully monitoring both notifiable incidents and near misses/near hits (the two categories overlap) is a critical element in preventing serious events. While notifiable incidents clearly warrant careful attention records of near misses/near hits or other events that may not be notifiable can also prove important in preventing serious incidents (for example unplanned falls of ground in areas of the mine where workers are not liable to be present). Other measures of safety performance such injury frequency rates tend to pick up common or routine hazards but are far less useful when it comes to infrequent but more serious incidents. The 2012 audit emphasised this point in relation to the effective use and selection of key performance indicators by organisations. These observations are still relevant and will not be repeated here, other than to make an additional point that was raised in the

course of the 2014. This is that, like notifiable incidents, under-reporting can be a problem with regard to injuries. The audit was given information that some employees experiencing an injury had been advised to take leave rather than lodging a workers' compensation claim. Such practices, which I have encountered before, are designed to minimise workers' compensation premiums or the injury incident rate at a workplace. In either case the inspectorate needs to remain alert to such problems as appears to be case.

As in 2012 the evidence obtained in my observation of an inspection, visit records and interviews with inspectors indicated that they were both monitoring and making good use of this information (which was readily provided by a number of worksites – another pleasing sign). Reviewing this information not only helps prevent serious incidents it can also provide valuable insights into the state of safety and health management at a worksite in addition to those identified through observation and general discussion. They also provide cues for areas or issues that require attention/inspection during worksite visits. As well as providing an additional and independent 'set of eyes' for reviewing incidents and remedial steps taken with regard to them, inspectors' experience of other workplaces enables them to alert management to important issues that may not be so apparent otherwise. In the course of the audit a serious problem was identified with regard to incident reporting. As the origins of this problem relate to the regulatory framework it will be addressed below in a broader discussion of the regulatory framework.

Interviews, materials and the workplace visit undertaken indicate that, as in the 2012 audit, notwithstanding the dispersed and remote location of many worksites inspectors visit mines and mineral processing facilities on a regular basis. Mining and mineral processing industry representatives were generally happy with the level of contact with the inspectorate including routine visits, responses to queries and reactive visits following an incident. Several interviewees indicated they found some inspectors 'more helpful' than others who they believed tended to be too officious or focus too much on enforcement. It was also suggested more interpersonal skills training could assist in this regard. On the one hand, these comments can be seen as not uncommon when it comes to any enforcement agency and that a diversity of approaches is not necessarily a bad thing (ie good cop/bad cop). In years of observing inspectors in a range of industries and jurisdictions (including Tasmania) I have witnessed this approach used to good effect. Without observing all inspectors in the field it would be impossible to make a judgement as to whether interpersonal skills are an issues requiring attention. It was not, in my view, an issue in either the 2012 or 2014 worksite visits I undertook.

On the other hand, it needs to be recognised that of the worksites visited by OCIM inspectors, mines entail a unique set of complex technical issues. At present only two inspectors have the requisite expertise and mining experience to make judgements and provide advice where compliance issues involve technical aspects of mining. The importance of this is evident to anyone with knowledge of mine disasters or who has accompanied inspectors on mine visits (as was done for this and the 2012 audit). For example, during the visit undertaken in February there was a lengthy discussion of technical issues related to a recent incident as well as a change in mining extraction plans due to changing ground conditions. These points are not made as a criticism of current mine inspectors without a mine engineering background or to suggest that

decisions on aspects safety and regulatory compliance all require technical expertise. Indeed, as was pointed out in previous audits these inspectors have valuable skill-sets relevant to high hazard work places like mines and mineral processing operations. For example, the remaining non-mining inspector has particular expertise and extensive experience in emergency procedures, safety systems and other high hazard work environments. He has been active in monitoring and improving safety at the worksites for which he is responsible, including a large mineral processing operation and is highly regard by the interviewees I spoke to.

The point being made is that the present composition of the OCIM doesn't include sufficient inspectors with mining expertise and experience to provide an optimal or effective level of regulatory oversight. As such, this reinforces findings and recommendations made earlier in this audit. One industry respondent was also critical of the capacity of the inspectorate to respond to all reactive issues like incidents in sufficient depth or at least to provide equal attention to all worksites in this regard. These criticisms require further investigation than is possible in this audit but tend to confirm concerns about resourcing already expressed.

As noted in earlier audits, the OCIM has continued to build bridges with both industry and unions, facilitating more effective communication. An experienced mine inspector no longer regularly attends meetings of the OHS committee of the Minerals Council because they wanted the opportunity to discuss OHS in private. However, the mine inspector presents an update of trends in notifiable incidents every six months (see below). The inspector with particular expertise in emergency procedures participates in the Tasmanian Minerals Council Emergency Response Committee and regularly attends their meetings.

Representatives of the two major unions covering the mining industry were also generally positive about relations with the OCIM and supportive of its activities. In general the OCIM has responded well to any critical comments emanating from either industry or unions. The findings of this audit are that the improvements since Beaconsfield identified in earlier audits have continued. In sum, OCIM has a good working relationship with both industry and unions, who respect and value its activities. Several interviewees suggested there were opportunities to enhance the level of tripartite collaboration to build a long term and more proactive approach to improving safety and health standards over time. A tripartite steering or advisory committee (as is found in some other states) could be one vehicle to achieve this, especially if it pursued particular activities rather than being a 'talkfest'. An activity that could form the initial focus of such as body is identified below.

The latter would also require active engagement and 'visioning' from industry (and representative bodies, notably the Minerals Council) and unions. I think the foundations for this are there. Notwithstanding some critical comments (on both sides) there is a generally mature and constructive relationship between industry and unions when it comes to safety in the Tasmanian mining industry. Occasional points of disagreement are to be expected. As incidents like Beaconsfield and Pike River amply demonstrate, it is absolutely essential that mineworkers, safety-representatives and unions have both access to information and the capacity to raise safety concerns with mine management or the inspectorate. Reviewing a large number of fatal incidents in five countries (including Australia and within that the state of Tasmania)

it has been a recurring point of concern that safety concerns were raised but ignored prior to many if not most of these events (Quinlan, forthcoming). High hazard workplaces like mines require a number of mechanisms where safety concerns can be raised because in practice some mechanisms will fail and it is essential to maximise the chances concerns will be identified and considered. On occasion concerns may be determined to be unfounded but in my experience such instances are rare and it is far more common for such concerns to be confirmed at least in part. Further, the process of considering issues is a critical part of a robust safety system and immeasurably preferable to the alternative of ignoring or dismissing concerns out of hand.

Interviews with industry representatives and union representatives indicate both take safety seriously and unions use their influence responsibly in this regard (their input was also seen in a positive vein in interviews with inspectors). There were significant areas of agreement between industry and union representatives (for example with regard to role and resourcing of the OCIM). The points of difference identified in the audit were of the type to be expected (and which I have encountered numerous times in the past) and certainly within the realms of a robust and constructive relationship that ultimately better safeguards those working in the mining and mineral processing industry. An exemplary instance of this is Cornwall Colliery's ready cooperation with a periodic inspection by a duly qualified CFMEU industry safety and health representative from NSW. Activities like this should continue. At a more general level it is important to recognise that, as occurs elsewhere, union/management relations vary between different worksites and can change over time (for better or worse).

There are preconditions for effective interaction between worker representatives including unions and management. First, ensure all health and safety representatives are duly appointed and properly trained. Trained representatives, with a good knowledge of the legislation and their responsibilities will be more effective in their tasks and follow protocols of trying to resolve issues with management prior to referring them to the inspectorate. There will be exceptions to this but these should be rare especially if management treats their concerns seriously, as it should. Second, wherever possible health and safety representatives should be available to talk to inspectors and accompany them on inspections. This helps build a healthy relationship and helps to ensure matters can be raised and resolved at an early stage. Interviews with inspectors indicated that they sometimes found it difficult to contact health and safety representatives when they came on site due to a mismatch with shift rosters. This problem has been experienced in other jurisdictions (Walters et al, 2014) but efforts need to be made to make such problems exceptional. Third and finally, union representatives/officials need the training and knowledge of legislation to carry out their tasks effectively as well as ready access to the workplace when pursuing legitimate safety concerns. It was pleasing to note that with one exception right of entry was not seen as a major issue. As indicated in the 2012 report right of entry provisions are an essential element in a robust mine safety regulatory regime and the vast majority of mine operators were viewed as very cooperative in this regard. .

A number of interviews indicated that, in general, relations between the mining industry and unions in Tasmania (when it comes to safety if not more generally) are more mature and cooperative than is the case in a number of mainland states. This is a judgement with which I would concur and continues on positive judgements made in previous audits. At the same time, regulatory provisions in Tasmania relating to

worker representation and requirements relating to the communicating information on inspections and incidents to worker representatives are deficient compared to best practices jurisdictions like NSW and Queensland that have recently been used as models for regulatory reforms in New Zealand. As with incident reporting this issue is dealt with in a later subsection of this audit report.

In addition to routine inspections OCIM has undertaken strategic activities designed to improve compliance and safety more generally in Tasmanian mines. A good example of this was in relation to ground support regimes. Reviewing evidence in relation to falls of ground at Tasmanian mines the inspectorate identified a deficiency with regard to a particular type of bolt commonly used in mines determining it was not appropriate to high stress situations. A detailed report was prepared and sent to the management of various mines and presented at a meeting of the OHS committee of the Minerals Council. This was followed with inspections where areas requiring risk assessment in terms of ground support were identified and mines were encouraged to undertake a review of their ground support regimes. In several instances where action was not forthcoming a suspension of operations was imposed in high risk areas. The overall effect of these activities, which occurred over a number of years, was to improve standards of ground support and a reduction in unplanned falls of ground. This provides an excellent example of a targeted and graduated campaign of the type that is used by other proactive mine inspectorates. As can be seen such activity takes a period of time to implement.

More recently OCIM has also undertaken initiatives with regard to other serious hazards including machinery fires and diesel particulates. The initiative on machinery fires included running a forum for operators so information on the wider issues (ie not just those relating to a particular site) could be presented and operators had a chance to exchange ideas and experience. Around September 2013 a forum on machinery fire safety was also run with machinery manufacturers, which looked at amongst things how ceramic coatings on machinery to could be used to suppress the risk of fires. Involving both operators and manufacturers in consideration of the fire safety issue is a proactive step that mirrors both a growing trend and best practice in other jurisdictions. It facilitated both parties seeing their responsibilities in this regard as well as some constructive engagement as to the underlying causes of machinery fires. An important finding to emerge in this regard was the critical role of maintenance, with poor maintenance being identified as a root cause of many machinery fires. This finding, which is entirely consistent with the pattern causes of mine fatalities identified earlier in this audit, will enable more targeted and effective measures to address the hazard. Similarly, two forums on managing diesel particulates – a known carcinogen – were well-received by the industry in helping them to address a challenging issue.

Another example of proactive measures by OCIM, referred to in 2012 audit, was organising G3 course in risk assessment for managers and others in September 2011. This activity assisted in the transition to a new legislative regime that placed increased emphasis on safety systems and risk management and indeed is a mandatory requirement in other jurisdictions like Queensland. It was also a positive step in terms of improving OHS management more generally. As with the ground support initiative it was an action directed at improving compliance with legislative requirements over time, not simply responding to an immediate problem. Given the turnover mine

management this activity will need to be repeated in the near future unless it is made a mandatory requirement for mine management by regulation (see discussion elsewhere regarding competency certification). Understanding risk assessment is essential for the development of principal hazard management plans and other activities central to mine safety. The need to maintain an emphasis on G3 or equivalent training was raised by a number of interviewees, confirming my own assessment.

OCIM inspectors have been active in promoting awareness of and use of risk assessment in mines, mineral processing and those quarries they visit. There has been a strong emphasis on management systems and in monitoring incident/near misses in order to track developments and also pass useful information back to management (such as similar incidents at other worksites). At a broader level, the engineering qualified mine inspector collects data on notifiable incidents at all mines. This information is collated and organised (for example by type of incident) and the results used to identify any trends or issues of concern. The information is also provided to the Minerals Council on a six monthly basis which helps them identify industry wide issues that are not apparent at the site of each representative. It is also useful in identifying and prioritising targeted campaigns and other compliance activity. I have reviewed a number of examples of this information and can confirm its value in terms of proactive enforcement. I would recommend this information also be forwarded to unions (suitably anonymised) if this is not already the case.

Interviews with inspectors also indicated that they were vigilant with regard to problems of 'paper compliance' and that systems can easily corrode over time unless measures are taken to arrest this. The mine visit I undertook confirmed these practices occurred as did interviews with industry representatives and others. The OCIM has conducted a number of worksite audits that have included both review of documentation (desktop) and physical inspection to ensure documented systems actually reflect what is happening in practice. The increase in this activity is welcome though I believe this area warrants more attention (see below).

In my view OCIM has also made selective and judicious use of its powers to suspend operations and to issue notices that require mines to demonstrate they can safely mine in potentially hazardous situations (including those evidenced by serious incidents like the recent mud-rush fatality). Such interventions, while rare, can prevent a fatality or, where a fatality has occurred (as was the case with Beaconsfield) ensure that mining in this area doesn't expose other mineworkers to the same risk. It is a more proactive and timely intervention that initiating a prosecution (although the action doesn't preclude prosecution where the circumstances warrant this). Similar measures have been necessary in jurisdictions usually seen as best practice like Queensland because even robust safety systems can corrode over time.

Interviews with those outside OCIM conducted as part of the audit confirmed that the OCIM was proactive in its approach though it was also indicated that current resourcing placed a limit on this. While acknowledging progress with regard to some major mining hazards (falls of ground and fire/explosion) interviewees identified others requiring more attention including falls from height, ventilation systems and inrush/inundation. Another area of concern raised, identified in previous audits, was the privatisation of registered plant inspection. Some interviewees expressed concern that the trajectory of improvement in both mine safety and the inspectors role in this

had stalled since 2012 while others believed the pattern of progress was continuing. It was possible to reconcile these apparently divergent responses when looking at their comments in more detail. This suggested that progress had not stalled in all areas but rather that progress in some areas was not being matched by what was occurring in relation to other hazards or issues. Even those expressing optimism, pointed to the constraints imposed by limited resourcing and activities they would have liked OCIM to undertake or assist in the preparation of short summary materials (relating to pre-start information or principal hazard management plans) that could be more readily referred to by mineworkers and supervisors than more extensive documentation. I believe this represents an accurate summary of the current situation.

Consistent with what has already been argued, the resolution was seen by interviewees to lie in both increasing the number of inspectors and in also taking advantage of current vacancies (and the more subdued mining environment) to appoint new inspectors with higher/more directly relevant qualifications/skill sets and mining experience.

Having said this several criticisms emerged in the course of the audit. One was related to the failure to implement an investigation protocol developed by an inspector within OCIM. Such protocols can be useful if appropriately applied. I was not in position to fully assess the protocol but believe its applicability and value warranted consideration. At the time of the audit, two major investigations were underway with regard to fatalities at Mt Lyell. This was demanding a considerable amount of the resources of both engineering qualified inspectors, especially the Chief Inspector of Mines.

One proposal raised in the course of the audit to relieve this burden was to allocate a specialist investigator (suitably located and available in and as required) to OCIM from WorkSafe Tasmania.[8] This proposal could have some benefits. Specialist investigators have knowledge and skills that can make the process both more efficient, timely and consistent. Specialist investigation/prosecution units are to be found in other mine inspectorates (such as NSW) although these units have technical expertise and knowledge of mining, something that wouldn't be the case with an investigator provided from within WorkSafe Tasmania. Certainly, if the allocation was made on an ongoing basis the investigator would develop knowledge about mining over time. On the other hand, at least one of the current investigations involve significant technical issues so even with a specialist investigator the burden on existing expert mine inspectors would only be partial. Further, part of this burden has been met by the engagement of an expert consultant and as a small inspectorate this option is probably always going to be the case with OCIM (for example a geotechnical expert was engaged by the independent investigation into the Beaconsfield goal mine fatality). Finally, as indicated earlier this issue also has its origins in the size and composition of the existing mine inspectorate. In sum, means for improving the efficiency of investigations needs to be considered but this is not an alternative to recommendations about the composition of the inspectorate made earlier.

[8] This proposal appeared to be part of establishing a more specialised serious incident investigation activity/unit within WorkSafe Tasmania. This approach has been used in other jurisdictions like Victoria with some success.

Another issue that was raised during interviews and is also consistent with my own observations is that while OCIM is trying to be proactive it needs to do more in this regard. In my view it needs to do so in two principal ways.

First, OCIM should conduct more targeted campaigns of the type that was undertaken with regard to ground support. Review of notifiable incidents to identify disturbing patterns and consideration of the eight major hazards leading to fatalities (especially in the light of recent fatal incidents) as well as emerging evidence on serious health issues (like diesel fumes) could be used to select the subject of series of targeted campaigns to be executed over time. Another area which should be prioritised in terms of targeted campaigns relates to the increased use of contractors in mining and other areas covered by OCIM. Both the 2010 and 2012 audits identified serious safety problems associated with the use of contractors – a point reinforced by recent fatalities in Australia, including Tasmania (see Commissioner Bell's comment earlier in this report). The issue was also raised repeatedly in interviews (with all stakeholder groups) carried out for this audit both in relation to mining and mineral processing. Some mines make limited use of contractors (for some maintenance etc) while in others substantial operational activities are undertaken by contractors. While some mining contractors were seen to have excellent safety systems and to implement them effectively this was not always the case and interviewees also referred to a 'disconnect' between contractor policies and practices and those of the mine operator. One industry interview indicated that the incidence of contractors in incidents was twice as high as other workers and that there were also problems with contractors reporting incidents – problems which took some time to rectify. Other concerns raised in connection with the use of contractors were that it weakened safety representative presence and activities, and that it also increased difficulties ensuring workers took proper meal breaks (and in appropriate locations) and in monitoring hours of work/fatigue amongst contract workers. These responses are entirely consistent with my experience of other jurisdictions and other industries as well as international research on OHS and contract labour (see Blank et al, 1995; Buessing and Weil, 2013; Karra, 2005; and Muzzaffar et al, 2013).

Second, as far as I can judge the OCIM doesn't undertake the level of regular detailed auditing of worksites I have seen in other jurisdictions involving both a careful review of documented systems/procedures followed by comprehensive physical inspection to ensure these systems/procedures are being implemented. The point that the current level of auditing activity was inadequate was made a number of times during interviews conducted for this audit. Targeted campaigns and compliance auditing are both overlapping and complementary processes (for example, targeted campaigns can be based on or entail worksite auditing). Auditing in other jurisdictions I am familiar with has played a critical role in identifying and rectifying gaps or inadequacies in safety systems, maintenance regimes and the like. It is, for example, standard practice in Queensland to audit principal hazard management plans and other key systems (like risk assessment procedures, investigation protocols and TARPs) when these are first developed and at periodic times thereafter (to ensure they remain up to date or accommodate to significant changes in the operation or hazards). Amongst other things, this auditing has identified instances where the principal hazard management plan (or other documents) is a 'cut and paste' job taken from documents pertaining to other sites without sufficient attention to their relevance (for example I have seen cases where the document may refer to positions with key accountabilities that don't

actually exist on the site in question). The same point applies when the nature of hazards vary somewhat between sites as is not uncommon. Borrowing from other documents may be appropriate but it needs to be done in a careful manner to ensure it is relevant to the particular site. During this audit I was informed of at least one instance of limitations arising from 'cut and pasting' a document had occurred in Tasmania.

Auditing has also been used to arrest the corrosion of systems over time – a not uncommon phenomenon. Placing the last point in the Tasmanian context, both the recent mud rush and fall fatalities could raise questions about the implementation of safe operating procedures and TARPs that might need to be audited at a range of sites to ensure there are not systemic problems. Similarly, the fatal mud rush was not the first serious mud rush to be experienced at the mine and this may raise wider questions about this hazard both at the mine and others. In short, investigations of a particular incident may have wider implications in terms of the need to audit other mines (and this occurs in other jurisdictions like Queensland).

Again, I believe the reasons for this deficiency in OCIM activity lie primarily in the realms of resourcing because OCIM simply lacks the number of duly qualified inspectors to undertake such tasks so there would be little point in developing a program in this regard (itself a resource intensive task). Consistent with this point, a number of planned activities were identified (including regular audits of mines) in the course of the audit where resourcing constraints prevented them being undertaken. Further, inspectors acknowledged that they were unable to delve into systems as part of regular inspections and that when audits had been undertaken they identified failures in systems that were not being picked up by routine activities, including inspections and discussions with both management and workers. The capacity to follow up on incidents, investigations and the remedies implement was also identified as a problem, especially in ensuring that root causes had been addressed (see for example the 10 pattern failure points identified in this report). Additionally, there is a need to be especially vigilant when the mining industry is experiencing challenging times because this can lead to changes in staffing, non-reporting and corner-cutting practices affecting safety. Awareness of these problems is precisely why so much emphasis is placed on auditing in jurisdictions like Queensland.

Detailed documentary review of even a single worksite takes time even if some of it can be done offsite. Similarly, physical inspection/verification in other mine jurisdictions typically involves teams of several inspectors and takes a day or more even when it doesn't include consideration of all significant hazards. In a coal mine this would include all the eight fatality mechanisms described earlier while seven would apply to metalliferous mining. This in turn, requires not just examining equipment as diverse as vehicles and ore crushing machinery, but road conditions, emergency and rescue procedures (including refuge chambers, emergency egress, lifelines and self-rescuer training) and a host of other matters. Auditing also requires specialised training and is often undertaken by specialist inspectors in other jurisdictions I am familiar with. Therefore there would be a need for several OCIM inspectors to be trained in this role (something that could also be enhanced by the capacity to observe these activities in another jurisdiction). At present, OCIM simply lacks the resources do this or to ensure inspectors are conversant with the practices being used in other jurisdictions. As this matter is urgent use could be made of an

expert consultant to assist in auditing while more permanent remedies are being implemented.

The point also needs to be made that the additional activities described and recommended cannot be implemented in Tasmania because it is a small jurisdiction is not sustainable on several grounds. First, irrespective of whether they are found in a large or small jurisdiction mines, or whether they are small or large, and mineral processing operations are high hazard work settings with precisely the same array of hazards to be managed. They therefore require the same degree of regulation and oversight. This point was explicitly acknowledged in the mine safety review undertaken in New Zealand in 2008-9 and it informed the changes to the regulatory regime made after Pike River. Second, the inspectorate in small jurisdictions can implement such a level of oversight and my contact with the Chief Mine Inspector in New Zealand indicates that the array of activities recommended are of the type currently being implemented in that country. It is also worth noting in passing that the new regulatory regime in New Zealand requires mines to undertake an audit (ie external and independent review) of their safety systems at regular intervals (my recollection is every two or three years). The results of this audit must be made available to the inspectorate. Such a requirement in Tasmania would not only aid the OCIM carry out its own activities but also assist mines in independently reviewing their safety systems to identify and address any deficiencies.

.

Given the limited number of workplace visits undertaken with inspectors this audit was less able to make some judgements about the overall level of safety management in mines and mineral processing that the 2012 audit. In the 2012 audit my impression was of an overall improvement in OHS practices and compliance but that activity continued to be focused on basic hazards, reflecting both the low base from which progress had been initiated and resource constraints on OCIM. Based on interviews, the one visit undertaken and other information my impression is that overall there has been a slowing of the improvement trend observed in previous audits. The recent fatalities are also a source of serious concern. While these incidents are still under investigation the mechanisms alone (falls down a shaft and a mud-rush) – both well known sources of fatal injury in underground mining – indicate serious hazards require a combination of close ongoing scrutiny from both management and OCIM as well as strategic campaigns by OCIM. Serious health hazards like diesel fumes also require a similar approach (I am aware some efforts have been made in this area). Notwithstanding the efforts of the some management at some worksites the OCIM needs to be able to take a more proactive role in securing a safe and productive mining and mineral processing sector in Tasmania. There is no room for complacency. As noted in earlier audits, initiatives to improve mine safety in Tasmania after Beaconsfield involved moving from a relatively low base compared to standards in leading mainland jurisdiction. There is considerable scope for further improvement as well as a danger that if momentum wanes some of the gains could be lost.

Finally but not least, the situation with regard to quarries remains unsatisfactory. While some quarries are inspected, as was the case in 2010 and 2012, the OCIM simply lacks the resources to provide adequate oversight of this sector, especially smaller quarries which are less likely to have OHS systems in place or to be aware of their legislative obligations. Quarries are potentially dangerous work environments

with a number of the hazards found in mining and where fatalities and very serious injuries have occurred in the past. The interviews I conducted for this audit which referred to quarries raised serious concerns about both the inadequate level of regulatory oversight (including the number of quarries inspected) and poor OHS practices. An industry representative stated he believed quarries were more prone to push the boundaries with machine guarding than mines and required careful oversight in this regard. The disparities in of oversight of quarries and mines/mineral processing materials also came in for criticism.

Several interviews indicated that small quarries in particular were rarely inspected. This is a particular concern because while this is understandable given the limited resources of OCIM, just as small mines have precisely the same array of hazards as large mines so small quarries have the same array of hazards as large quarries. Further, small quarries are less likely to have developed OHS management systems or to have worker representation (via a safety representative or union presence) that could inform the inspectorate of problems. Quarries, including smaller operations, also make use of contractors so are not immune to the problems mining and mineral processing have experienced in this regard. The clear impression was that any progress identified in the 2012 audit had slowed if not stalled. This deficiency needs to be addressed as a matter of urgency (as is now occurring in New Zealand) by appointing an additional inspector with primary responsibility for this sector. I also recommend that a future OCIM audit should include additional attention to quarrying, including several visits to quarries, at least one of which should be a small operation that has not been previously inspected.

Regulatory framework issues

The capacity of OCIM to effectively carry out its functions is also influenced by the regulatory framework that it operates under. This emerged as an important issue in this audit, particularly with regard to several problems identified below (relating to notifiable incidents, the certification of competencies, coverage of coal mining hazards), but also more generally. As noted earlier, after abolishing all mine specific legislation/regulation in 1995 a number of new regulatory requirements specific to mining were introduced in Tasmania in 2011 to address problems identified in several coronial inquests and associated investigations. These changes included strengthened requirements for notification of incidents and to implement systems and risk assessment in ways broadly similar to legislation in mainland jurisdictions like Queensland.

Unlike NSW, Queensland and Western Australia there has been no systematic and comprehensive review of mine safety legislation in Tasmania for well over 20 years. In Queensland and NSW the Moura No.2 and Gretley mine disasters led to a ‘root and branch’ overhaul of mine safety regulation and the inspectorate that were generally similar in character. Although NSW retained more licensing requirements, the new regime both mandated systems and risk assessment while also retaining extensive prescriptive regulation in relation to well known hazards including requirements with regard to explosive gases like methane, equipment to be used underground, ground support, sources of ignition suppression and certified competencies for safety critical activities. Western Australia also revised its legislation in a broadly similar but more distinctive fashion following several reviews of mine safety legislation after 2000.

After Pike River (2010) New Zealand also significantly overhauled its mine safety regulatory regime (again including the inspectorate) modelling it on the laws applying in NSW and Queensland.

Since the time of the last audit another complicating issue has arisen. Unlike states with stand-alone mine safety legislation like Queensland, Tasmania's involvement in the federal harmonisation of work health and safety legislation means that it has 'inherited' the mine safety regulations developed under this package. In my view, this package is inferior to that found in the legislation of jurisdictions like Queensland. It has also created a number of significant problems with regard to mine safety regulation in Tasmania. This point was made forcefully in a number of interviews conducted for this audit, covering a range of stakeholders and including parties very conversant with the current regulatory framework and the effect of changes in this. The point was also made that the changes had added to the workload of the inspectorate. This is inevitable with any regulatory change and might have been acceptable had this entailed a long term improvement in regulatory standards. However, this does not appear to be the case so far as mine safety (see below).

It is beyond the scope of this audit to undertake a detailed comparison of current Tasmanian regulation with that found in other jurisdictions in order to identify areas requiring attention or confirm there are issues. Rather, the audit identifies a number of issues below which warrant attention and also illustrate the need for a broader reconsideration of the regulatory framework.

Notifiable Incidents and Investigation

The introduction of the new *Work Health and Safety Act* and associated Regulations has created a problem with regard to notifiable incidents. The previously applying Workplace Health and Safety Regulation 1998 (clause 63) required that following an accident or incident that causes, or has the potential to cause, serious injury or damage at a workplace, an accountable person must investigate the accident or incident to attempt to discover its cause; and identify and implement measures to prevent a recurrence. Incident notification to the regulator is still required under the new *Work Health and Safety Act* (s38). However, once this has been done by the fastest possible means, including phone there are no further obligations to fulfil. The organisation doesn't need to submit a written report or for the site to conduct an investigation into the incident.

If an inspector is unable to attend the site following the notification (difficult if not entirely impractical given the current level of resourcing) there is a risk the incident will not be investigated or that the investigation will be cursory and not give sufficient attention to identifying effective remedies to prevent a recurrence. Gaps or deficiencies in investigation will also affect the capacity of the mine and the inspectorate to analyse trends in near misses/high potential incidents which in turn will weaken their capacity to prevent serious incidents. As noted in previous audits, incident notification and investigation reports are a critical tool for OCIM inspectors to monitor safety and prevent serious/fatal incidents. While some inspectors indicated that mines appear to be abiding with the old requirements this is still an unsatisfactory and potentially dangerous situation.

Two other but related issues were raised with regard current notification requirements. First, the definition of a notifiable incident requires that there is immediate or imminent danger to a worker. The view was expressed to me that this is too narrow because it excludes incidents like unplanned falls of ground, , seismic events and mud-rushes which occur where nobody is present. It was suggested that presons conducting a business or operation (PCBUs) should have to report all incidents where a person could have been seriously injured if they had been in the area at the time and the area was a worker access area. I am in strong agreement with this point, having made an essentially similar point in my report on the death of Larry Knight at the Beaconsfield mine and in previous audits. It is my understanding that in Queensland the requirement to report High Potential Incidents (HPI) is wide in its interpretation of what constitutes a HPI. Even apparently minor incidents, including small falls of ground or seismic events, can provide information on changes to ground conditions or mining methods that when combined with other information can aid the inspectorate as when an intervention or just request for further information is appropriate.

Second, concerns were also expressed that incidents that should have been notified (even under existing definitions) were not being reported and examples of a very serious nature were cited by reliable sources.[9] The critical nature of incident reporting in high hazard reporting was emphasised in both previous audits (not to mention fatal incident investigations including Beaconsfield and Pike River). It was noted that OCIM had made significant efforts to improve reporting, something aided by regulatory changes made in the aftermath of Beaconsfield fatality. However, more remains to be done and it appears that new regulatory requirements are not facilitating this. In Queensland, failure to report high potential incidents are treated as a serious breach of the legislation which can lead to a 'show-cause' conference with the Chief Mines Inspector (where a warning is issued that the next step will be prosecution) or even suspension of the mining operation.

There is ample evidence as to why this is deeply concerning. Deficiencies in incident notification and incident investigation played a part in the Beaconsfield mine fatality (and Pike River too for that matter). In other jurisdictions which I am familiar the inspectorate takes a close interest in investigation processes following high potential incidents as a primary means of ensuring hazards with the capacity to seriously injury or kill are addressed, and that mine safety systems include robust investigation and rectification processes. Further, the 2012 audit identified a number of serious deficiencies in investigation practices at one mine visited. The current regulatory requirement is only likely to exacerbate such problems.

One means of addressing the investigation problem (and presumably the notification issue too), which has already been suggested, is for the Chief Inspector to issue a direction to mine operators and senior officers to require such investigations to occur and be reported, relying on their powers under s9(1) of *Mines Work Health and Safety (Supplementary Requirements) Act 2012.* The Chief Inspector indicated he intends to do this. While this is entirely appropriate , and indeed, it should be done as an interim measure, I believe such a requirement should be mandated under legislation/regulation as is the case in other jurisdictions I am familiar with. The

[9] For a number of reasons including confidentiality I have withheld details of these incidents.

issuing of directives should, in my view, be normally reserved for abnormal issues, contingencies or to supplement mandatory requirements in particular circumstances. Directives should not be needed to fill very basic gaps in regulation.

Coal Mining and other mine specific regulations/codes

While legislative changes made in 2011 addressed a number of the gaps created when mine specific regulation were abolished in 1995 and brought the broad thrust of Tasmanian legislation (with regard to mandating management systems) the changes did not create a comprehensive regulatory regime dealing with hazards specific to the mining industry. This issue was raised in at least one of the coronial inquests referred to in this report and it was also raised by my report prepared for the coroner as part of the independent investigation into the death of Larry Knight at the Beaconsfield mine. While endorsing the changes made in 2011, my concerns that this was only a first step and more needed to be done increased substantially as a result of my involvement with the Pike River mine disaster and regulatory responses in New Zealand. Preparing reports on mine safety regulation and serious mine incidents in five countries for the then New Zealand Department of Labour in 2011, reviewing the Royal Commission findings handed down in 2012, and my involvement in the Expert Reference Group that oversaw the development of a new regulatory package in 2013 confirmed two things. First, that effective mine safety regulation requires a combination of clearly mandated requirements related to systems and risk assessment (including principal hazard management plans and TARPs) as well as detailed regulations/codes relating to the monitoring and control of well-known hazards (like falls of ground, inrush and fire/explosion). Such regimes exist in NSW and Queensland and have been more recently implemented in New Zealand. Second, although Tasmania has some of the requirements just mentioned it still lacks a comprehensive regulatory regime with regard to mine safety, and with regard to detailed regulation falls behind most other jurisdictions I reviewed.

These concerns were confirmed, if not reinforced, by observations and discussions undertaken in the course of this audit. For example, a significant number of interviewees (from all stakeholder groups) called for the introduction of additional legislation, regulations and codes as a matter of urgency, complaining at the prolonged time this was taking. This included Chapter 10 of the federal model Work Health and Safety Regulation which deals with mines or alternatively mining legislation more closely modelled on NSW or Queensland. Other areas of need identified with regard to Tasmania included specific codes establishing procedures relating to high hazard activities like pillar extraction/ground support and the like. Codes and regulations are valuable because they assist mine operators by providing more information or guidance on how they can meet their general duties, when to undertake risk assessment and what controls or remedies to well-known hazards need to be implemented.

The uncertainty of the current situation in the context of the implications of the harmonisation of OHS legislation also came in for criticism. For example, industry representatives made the point that if Tasmania adopted chapter 10 from the national model regulations this was a lengthy document which required time and resources to understand and accommodate to its requirements. Mines were already working towards implementing aspects of this (the parts mentioned, such as principal hazard

management plans, are also found within NSW and Queensland legislation[10]), on the expectation they would be introduced. Industry representatives complained that the delay (one stated it was two years in his view) in implementing the new mine safety regulatory regime was not conducive to a structured and planned revision of safety systems and the like, especially given the necessary expenses associated with the transition and the time needed to fully acquaint all operational personnel with the new regime and their responsibilities under it. The point was also made that OCIM simply lacked the resources to assist in this process by providing some guidance to mines and mineral process operations. In Queensland, by way of contrast, inspectors spent some time visiting work sites and explaining the key changes involved in the new regulatory regime introduced in the late 1990s and the mine inspectorate also prepared advisory material to assist management and others understand and comply with the regulatory framework. An industry representative indicated he had concerns that unless the resourcing of OCIM was improved it would lack the capacity to implement the new regulatory framework and thereby secure the benefits associated with this.

At present Tasmania lacks a comprehensive set of codes/regulations for coal and metalliferous mining. New Zealand has addressed this issue, using NSW and Queensland regulation/codes as models - a more consistent and cost effective process than developing new codes from scratch. These jurisdictions were chose because they represented world's best practice in mining regulation and New Zealand was also keen to align its regulatory regime with Australia where possible as part of Closer Economic Relations (a similar process has been followed with OHS legislation more generally).

As already noted, coal mining entails a number of particular hazards (including inflammable gases and dust) that require particular attention but as far as I aware not the subject of any specific regulation or codes in Tasmania. The absence of adequate regulation specific to coal mines was identified as a significant problem by a range of parties interviewed and it was indicated that a systematic review is required to address this. I am in agreement on both points. The problem has not gone unnoticed by the current coal mine operator which in a commendable action (and sound risk management based decision) has voluntarily adopted measures modelled on those that would be mandated in one of the two 'best practice' mine regulation states already referred to. The mine was also supportive of periodic visits by duly qualified coal mine inspectors and industry safety and health representatives from NSW to assess its practices, provide advice and help ensure the safety of its mineworkers (as noted elsewhere this audit believes access to a local inspector with expertise in coal mining is required as was the case prior to 2000). While praising these efforts they are not a substitute for establishing a more comprehensive regulatory framework with regard to coal mining for a number of reasons. First, this approach may not be adopted by a new coal mine operator or it may change at the existing operator should the management team or owner change in the future. Second, the mine inspector will be in stronger and clearer position to provide advice or take other actions if an instance of non-compliance is detected where these requirements are spelled out in a regulation or code.

[10] Not surprising because these requirements originated in the mine safety legislation of these jurisdictions.

The reference point for addressing this problem should be the 'best practice' regulatory frameworks operating in Australia's two major coal mining jurisdictions, namely NSW and Queensland. These are relatively similar (although the NSW regime is more prescriptive with regard to electrical hazards) and New Zealand experienced no significant difficulty in using both as a model for its substantial revision of mine safety regulation in 2013. The key issue is that one (if not both) should serve as a model for Tasmanian regulation.

The points raised with regard to regulatory shortfalls are not only applicable to coal mining but also metalliferous mining. One example that applies to both coal and metalliferous mining is with regard to certification of competency for key roles in mining including mine-manager, underground supervisor, shot-firer and the like. Historically, these requirements were introduced as a response to disasters in an effort to ensure those making safety critical decisions or undertaking safety-critical tasks had the knowledge and experience to make sound judgements in this regard. They have been retained - though periodically upgraded in the light of changes to knowledge, education modes and regulation[11] – in the mine safety legislation of almost all mining jurisdictions in the countries I reviewed for the New Zealand Department of Labour, namely Australia, New Zealand, Canada, the UK and the USA. They have been retained because having people with the specific technical expertise and knowledge of mining to make sound decisions remains an essential element of mine safety (indeed New Zealand significantly upgraded its requirements in this regard following both the mine safety review undertaken in 2008-2009 and more especially after Pike River). Tasmania is a conspicuous exception in this regard.

As in several other areas, my initial concerns in this regard were confirmed and reinforced by a number of interviews undertaken in the course of the audit. I was informed that some mines had sent their underground supervisors (also referred to as deputies in coal mining) interstate to be certified but that this practice was neither universal nor always retained over time. Reference was also made to supervisors with inadequate qualifications and background experience in mining. The scope of this audit did not enable me to verify specific criticisms and the supervisors in the mine I visited seemed to be suitably qualified and experienced. Nonetheless, even if the practice of sending supervisors interstate to ensure they are qualified was universal across all mines (and I suspect it isn't) the failure to mandate supervisor qualifications is a serious issue. Underground supervisors make safety critical decisions on a daily basis and the situation now in Tasmania would not be accepted in NSW or Queensland (or indeed in New Zealand). Further, the point doesn't simply apply to underground supervisors but a number of positions deemed to be safety critical, including mine managers. Decision-making structures need to reflect this logic so that safety critical decisions are made by those best qualified to make them.[12] This can be aligned with the responsibilities of the Senior Site Officer (SSO) as has been done in other jurisdictions (and to also ensure it is the SSO who is responsible for making decisions affecting safety on site not those remote from the site such as a Board of Directors).

[11] For example, risk assessment is now included in the mandatory training requirements for mine managers in jurisdictions like Queensland.

[12] It should be recalled that in fatal mine incidents at two Tasmanian mines a decade or so ago, essentially subordinate managers had been designated as responsible officers.

This situation should be addressed as a matter of urgency. As already indicated the regulatory frameworks applying in NSW and Queensland represent the best basis for evaluating and remedying current gaps. These regimes are similar in most critical respects. One interviewee raised concerns about stringent licensing/regulatory requirements in NSW with regard to electrical issues. To my knowledge the more prescriptive approach to regulation in NSW is largely confined to electrical issues and my recollection is that some licensing requirements are being phased out there. Even if the latter was not the case the obvious solution would be to follow the Queensland approach. The multi-representative Expert Reference Group approach used in New Zealand (see below) was able to work through issues like this and provide advice on a regulatory framework that was both effective and practical.

There are other gaps in regulation which may have dire consequences. Regulations have been built up over many years, often in the wake of disaster and deaths, to provide practical solutions to well-known hazards and ensure tragedies don't recur. One such regulatory requirement is the necessity of maintaining a second means of egress to any underground mine. This rule was introduced in response to mine disasters in the UK (especially one in the 1860s) where hundreds of entrapped mineworkers died after mine shafts became blocked. Entrapment was also responsible for the worst mine disaster in Tasmanian history when 58 trapped mineworkers died at the Mount Lyell mine in 1912. More recently, the issue received particular attention following the Pike River mine disaster. Revised regulation in New Zealand requires a second and effective egress for all underground workings and similar requirements are standard in other mining jurisdiction. Regulations like this are required in Tasmania so there can be no debate/doubt as to this requirement. It is worth noting that amongst those raising concerns about regulatory gaps like the second egress issue were industry representatives.

Another area where Tasmania compares unfavourably to 'best practice' jurisdictions is with regard to worker involvement mechanisms. In NSW and Queensland mine safety legislation (especially that relating to coal mining) establishes both industry and site safety representatives with powers of inspection, rights to information and to take action in situations of immediate danger that are beyond those found in the *Work Health and Safety Act*. For example, these representatives (who are experienced miners and receive both training and annual updates) undertake regular inspections, file reports that become part of the mine record book, and have access to the inspection reports of government inspectors (indeed reports are exchanged between both parties by email). These arrangements are longstanding and were introduced in recognition that given the serious hazards mineworkers encountered they required meaningful mechanisms to protect their safety.[13] The principle that workers in high hazard industries deserve greater participatory and rights to safeguard themselves has been extended to other high hazard industries like offshore oil production (Quinlan, forthcoming). Following Pike River the New Zealand government introduced industry and site safety and health representatives into mining that were modelled on NSW and Queensland (and went beyond the participatory mechanisms found under general OHS legislation). Further, recent research in Queensland indicates that both industry and site representatives use their rights and powers both responsibly and judiciously,

[13] Indeed the arrangements have existed at one time in almost all states, including Tasmania, where legislation was proposed in the aftermath of the Mount Lyell mine disaster in 1912.

and their contribution to safety is both respected and valued by senior mine inspectors (Walters et al, 2014).

During the course of the audit a number of concerns were raised with regard to current site safety representatives in mines, including an inability to access training at some mines because the representatives were not duly appointed under the legislation. Duly appointed, trained and empowered safety representatives are more likely to have the confidence of mineworkers, including allaying their concerns on occasion (as has occurred in Queensland, see Walters et al, 2014). The increasing use of contract mining operations also raised concerns in this regard. Another issue was the absence of shared access of representatives (including unions) to electronic copies of incident and inspection reports. The latter issue was raised in the 2012 audit and given that this already occurs in Queensland indicates the practice is entirely workable and beneficial to all concerned (and the model for a regulatory infrastructure to secure this already exists). Previous audits noted that the situation with regard to worker involvement in safety and health had improved since 2006 but the situation still seems far from optimal. The audit recommends that serious consideration be given to following the New Zealand approach of introducing industry and site safety and health representatives in the mining industry, modelled on those currently operating in NSW and Queensland.

Conclusion

Overall, the issues identified in this section of the audit indicate that a process of reviewing existing regulation and rectifying any gaps or deficiencies needs to occur as a matter of some urgency. While changes to mine safety regulation will not be popular in some quarters it is imperative critical gaps in or problems with existing regulations be addressed because most if not all (like incident notification) are pivotal to preventing fatal incidents. Unlike New Zealand, Tasmania has the opportunity to rectify this problem without having to experience a tragic and large multiple fatality incident. Re-instituting certification requirements may entail some transitioning arrangements, administrative issues as well as (comparatively small in my view) additional costs but if a small mining jurisdiction like New Zealand can deal with these (and would probably share its experience in this regard) there is no reason why Tasmania could not do the same.

There are models to draw from and there are also ways to ensure that the measures are both practical and effective in the Tasmanian context. In New Zealand the process safeguarded the interests of various stakeholders and ensured recommendations would be practical because the Expert Reference Group included representatives from industry (including quarries), unions, an former chief mine inspector from Queensland, the Chief Mine Inspector of New Zealand and several safety experts (including myself). At the same time, the Royal Commission gave clear direction as to the general thrust of reform measures and where the model for regulatory provisions should be drawn from. A tripartite steering committee composed of representatives of various industries (mining, mineral processing and quarrying), the two mining unions and OCIM/WorkSafe Tasmania was suggested to review and make recommendations on the regulatory framework. Together with the inclusion of several experts this was the approach adopted in New Zealand and I recommend it as the most appropriate way of dealing with the issues just raised.

Findings: Organisation structure, budget and operational effectiveness

1. The current organisational structure of the OCIM and location of inspectors is broadly appropriate and fit for purpose. The Chief Inspector is able to maintain close links with other senior managers within WorkSafe Tasmania (most notably the Compliance Director and General Manager) and there seems to be a good working relationship between inspectors based at the Rosny and Burnie offices. Locating an inspector in Hobart (Rosny) makes sense of its proximity to a major metal processing facility and quarries in the south of the state. The Burnie office is best-located in terms of servicing the West Coast mines. While Launceston is closer to the Cornwall Colliery than Burnie this doesn't seem to be a issue in terms of maintaining contact and spreading the small mine inspectorate across three different offices would not be beneficial.
2. With regard to the budget salary and salary-related costs are the overwhelming component of the OCIM budget. A number of non-salary budget issues raised in earlier audits appear to have been addressed though the importance of maintaining adequate access to vehicles and training/knowledge updating activities needs to be emphasised. For reasons explained in the report it is critical that the Chief Inspector should regularly attend the annual meeting of chief mine inspectors of Australia and New Zealand.
3. While efforts have been made to address some deficiencies identified in earlier audits the overall budget is not adequate and nor has it been placed on a sustainable footing – a significant recommendation of the 2010 and 2012 audits. The budget is not adequate to meet the costs of staffing needs identified in this report both in terms of numbers and the qualifications of appointments identified as essential in this report.
4. The OCIM budget needs to be placed on a more sustainable and predictable footing. The uncertainty associated with recurring budgetary pressures on government agencies, including WorkSafe Tasmania, are not conducive to a planned and strategic approach to maintaining safety standards in a high hazard industry. WorkSafe Tasmania has made efforts to insulate OCIM as far as possible from budget shortfalls but, viewed in the context of budget/staff cuts described in the 2012 audit, it seems extremely doubtful that the agency has the resources to fund OCIM at a sustainable and appropriate level. Previous audits identified two options to resolve this problem. First, the imposition of a levy on the industry to fund OCIM – an approach that has been used with regard to several mine inspectorates on the mainland. While such a levy would not be universally popular both the 2010 and this audit found industry representatives want the OCIM to be adequately funded and several indicated they would accept this approach if it was the only way this outcome could be secured. Second, allocating a set fraction of mining royalties to cover the costs of the OCIM. The 2012 audit showed that the amount required would only represent a small proportion of annual total royalty receipts. Needless to say this option was more popular with industry because it entailed no additional costs on them. Both these options offer the advantage of being able to tie funding from the industry to OCIM and so avoid the risk of cross-subsidisation of other activities (this point was made but one industry representative). This audit strongly recommends that the OCIM budget be placed on a more sustainable footing by adopting one of these two approaches.

5. Salary levels continue to be a source of uncertainty and concern within the inspectorate. Further, the arrangement doesn't accord with the salary setting practices of mine inspectorates in other states I am familiar with, which represent a better approach of having a distinct salary scale for mine inspectors. This places Tasmania at a disadvantage in terms of recruiting and retaining well qualified mine inspectors. This audit recommends that a separate salary structure be established for mine inspectors that better reflects the task requirements/expertise and market demand for these skills. The salary structure should include two broad classifications, one for mine inspectors without mine engineering qualification and another (higher scale) for those with engineering qualification. The salary of the Chief Inspector of Mines should be based on a loading/payment additional to the higher classification to reflect their administrative/managerial tasks and greater responsibilities.
6. Salary levels within this scale should be determined by periodic benchmarking against salary levels paid in other Australian mining jurisdictions. While Tasmania may not be able to precisely match the salaries paid to mine inspectors in the better paying jurisdictions (like WA, Queensland and NSW) the salaries should be sufficiently comparable to them and salaries in the private sector to ensure that quality staff can be recruited and retained. Tasmania offers lifestyle advantages and the role of mine inspector is also attractive to some mine managers or other suitably qualified applicants. The mining industry is also not experiencing the boom conditions of several years ago. While these factors enable some 'salary discounting' mining is a high paying industry and failure to pay broadly comparable salaries is liable to adversely affect/recruitment retention and staff qualifications/expertise.
7. While the OCIM has maintained a proactive approach to securing compliance its capacity to do this needs to be strengthened through changes to the size and qualifications, skills and experience of the inspectorate. In particular, OCIM needs the resources to conduct both targeted campaigns and systematic auditing - the types of activities that central to success of 'best practice' inspection regimes found in NSW and Queensland. In addition to new appointments the skill set of existing inspectors needs to be upgraded (in the area auditing in particular). As an interim measure some use could be made of an expert consultant to assist with auditing.
8. OCIM has a constructive relationship with both industry and unions and overall the relationship between industry and unions is also mature and constructive in terms of safety. There are opportunities to build collaboration with regard to a more proactive long term improvement in safety and health standards in Tasmania. These should be encouraged.
9. The current regulatory framework in Tasmania is deficient in a number of regards, both due to a failure to conduct a full assessment of the regulatory framework following Beaconsfield as has occurred in other jurisdictions, and due to some implications of the harmonisation of OHS legislation. The deficiencies identified in this audit are significant, including adversely affecting the capacity of the OCIM to carry out its tasks effectively. They require urgent attention. A review of mine safety regulation in Tasmania should be undertaken as soon as possible to ensure the regulatory framework accords the best practice regimes found in Queensland, NSW and now New Zealand. Borrowing from these models will be more efficient (in terms of time and cost) and will more closely align Tasmania with other parts of Australia

(which itself has advantages in terms of developing systems, moving people and the like) The process could and should be facilitated (to ensure fit with local circumstances) by a tripartite steering committee.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

An adequately resourced inspectorate using a strategic and proactive approach to implementing compliance with a well-structured regulatory framework is essential to meet community expectations relating to mine safety. The OCIM has endeavoured to fulfil its responsibilities in this regard, with a number of notable improvements since 2006. Nonetheless, the OCIM is hampered by inadequate resources and an inadequate regulatory framework. Recommendations to address this are made below. Before doing this it should be noted that the value of effective regulatory oversight, including an adequate number of suitably qualified inspectors and a sustainably funded mine inspectorate, is something that is supported across the industry.

While regulation can sometimes be seen as burden on business, mine safety regulation is a critical element of an efficient and sustainable mining industry. The New Zealand government significantly strengthened its mine safety regulation following Pike River not only because the community demanded such a response but also because unless it could provide some assurances relating to safety its small mining industry (like Tasmania's) might be imperilled by a further serious event. Safety failures can also be extraordinarily damaging for individual firms and those who rely on them for employment. Pike River is by no means the only time a mine has been closed by disaster and Tasmanian experience over the past decade demonstrates how a serious incident can lead to a lengthy and very costly suspension of mining operations. This has cascading effects on the community via the loss of work and income. Further, as noted in the 2012 audit each work-related fatality involves at least several million dollars in economic costs plus an incalculable level of suffering to families and friends (see also Risbey et al, 2007; and Matthews et al, 2012). As the experience of NSW and Queensland highlight a robust regulatory regime can play a significant role in minimising the prospects of such occurrences.

Findings

Inspectorate Resourcing, Numbers and Qualifications/Skill Sets

An adequately resourced inspectorate is essential to providing effective regulatory oversight of mine safety. Inadequate resourcing has been a contributory factor in a number of fatal incidents, including the Pike River mine disaster and a number of mine fatalities in Tasmania. Indeed, it is 'pattern' flaw that has been found repeatedly by investigations into serious mine incidents.[14] It is also notable that the three major mining states in Australia (NSW, Queensland and Western Australia) all upgraded their mine inspectorates in the past decade as part of measures to improve mine safety. The New Zealand government did this too in the wake of the Pike River mine disaster.

This audit makes the following specific findings.

1. Notwithstanding the closure of mining operations at Beaconsfield the current establishment of five inspectors is inadequate and as recommended by

[14] This issue is examined in a detailed review of fatal mine incidents in five countries (including Australia) since 1992. Quinlan, M.(forthcoming), *Ten Pathways to Death and Disaster: Learning from Fatal Incidents in Mines and Other High Hazard Workplaces*, Federation Press, Sydney.

previous audits an additional inspector needs to be appointed with primary responsibility for quarrying.

2. The qualifications composition of the current establishment is not adequate for the tasks it is required to undertake and not comparable to that found when benchmarked against another small mining jurisdiction namely New Zealand. To rectify this, the two posts which are vacant at the moment should be filled by applicants with mine engineering qualifications, one with specialist knowledge of coal mining and one with specialist knowledge of metalliferous mining. With regard to the latter applicants who have the qualifications and experience to manage a metalliferous mine might also be considered.
3. Engineering qualified mine inspectors need an opportunity to upgrade their skill set periodically and to gain insights into practices and developments in larger jurisdictions. The Chief Inspector of Mines should attend the annual meeting of Chief Mine Inspectors of Australia and New Zealand as a matter of course for the reasons already identified in this report.
4. If the interregnum prior to the appointment of a qualified coal mine inspector is more than six months, an inspection by a qualified coal mine inspector from another jurisdiction (or a suitably qualified and experienced equivalent like David Reece) should be organised.
5. Provision should be made for specialist expertise (notably geotechnical expertise) to be brought in on a consulting basis as required.
6. The additional training needs identified in this section, including those with regard to auditing, should be addressed
7. The adequacy of current arrangements with regard to electrical inspection should be reviewed.

Organisational Structure, Budget and Operational Issues

1. The current organisational structure of the OCIM and location of inspectors is broadly appropriate and fit for purpose. The Chief Inspector is able to maintain close links with other senior managers within WorkSafe Tasmania (most notably the Compliance Director and General Manager) and there seems to be a good working relationship between inspectors based at the Rosny and Burnie offices. Locating an inspector in Hobart (Rosny) makes sense of its proximity to a major metal processing facility and quarries in the south of the state. The Burnie office is best-located in terms of servicing the West Coast mines. While Launceston is closer to the Cornwall Colliery than Burnie this doesn't seem to be a issue in terms of maintaining contact and spreading the small mine inspectorate across three different offices would not be beneficial.
2. With regard to the budget salary and salary-related costs are the overwhelming component of the OCIM budget. A number of non-salary budget issues raised in earlier audits appear to have been addressed though the importance of maintaining adequate access to vehicles and training/knowledge updating activities needs to be emphasised. For reasons explained in the report itt is critical that the Chief Inspector should regularly attend the annual meeting of chief mine inspectors of Australia and New Zealand.
3. While efforts have been made to address some deficiencies identified in earlier audits the overall budget is not adequate and nor has it been placed on a sustainable footing – a significant recommendation of the 2010 and 2012 audits and the Beaconsfield Coronial Inquest Findings. The budget is not

adequate to meet the costs of staffing needs identified in this report both in terms of numbers and the qualifications of appointments identified as essential in this report.

4. The OCIM budget needs to be placed on a more sustainable and predictable footing. The uncertainty associated with recurring budgetary pressures on government agencies, including WorkSafe Tasmania, are not conducive to a planned and strategic approach to maintaining safety standards in a high hazard industry. WorkSafe Tasmania has made efforts to insulate OCIM as far as possible from budget shortfalls but, viewed in the context of budget/staff cuts described in the 2012 audit, it seems extremely doubtful that the agency has the resources to fund OCIM at a sustainable and appropriate level. Previous audits identified two options to resolve this problem. First, the imposition of a levy on the industry to fund OCIM – an approach that has been used with regard to several mine inspectorates on the mainland. While such a levy would not be universally popular both the 2010 and this audit found industry representatives want the OCIM to be adequately funded and several indicated they would accept this approach if it was the only way this outcome could be secured. Second, allocating a set fraction of mining royalties to cover the costs of the OCIM. The 2012 audit showed that the amount required would only represent a small proportion of annual total royalty receipts. Needless to say this option was more popular with industry because it entailed no additional costs on them. Both these options offer the advantage of being able to tie funding from the industry to OCIM and so avoid the risk of cross-subsidisation of other activities (this very point was made byt one industry representative). This audit strongly recommends that the OCIM budget be placed on a more sustainable footing by adopting one of these two approaches.
5. Salary levels and determination continue to be a source of uncertainty and concern within the inspectorate. Further, the arrangement doesn't accord with the salary setting practices of mine inspectorates in other states I am familiar with, which represent a better approach of having a distinct salary scale for mine inspectors. This places Tasmania at a disadvantage in terms of recruiting and retaining well qualified mine inspectors. This audit recommends that a separate salary structure be established for mine inspectors that better reflects the task requirements/expertise and market demand for these skills (as is the case in jurisdictions like NSW). The salary structure should include two broad classifications, one for mine inspectors without mine engineering qualification and another (higher scale) for those with engineering qualification. The salary of the Chief Inspector of Mines should be based on a loading/payment additional to the higher classification to reflect their administrative/managerial tasks and greater responsibilities.
6. Salary levels within this scale should be determined by periodic benchmarking against salary levels paid in other Australian mining jurisdictions. While Tasmania may not be able to precisely match the salaries paid to mine inspectors in the better paying jurisdictions (like WA, Queensland and NSW) the salaries should be sufficiently comparable to them and salaries in the private sector to ensure that quality staff can be recruited and retained. Tasmania offers lifestyle advantages and the role of mine inspector is also attractive to some mine managers or other suitably qualified applicants. The mining industry is also not experiencing the boom conditions of several years ago. While these factors enable some 'salary discounting' mining is a high

paying industry and failure to pay broadly comparable salaries is liable to adversely affect/recruitment retention and staff qualifications/expertise.

7. While the OCIM has maintained a proactive approach to securing compliance its capacity to do this needs to be strengthened through changes to the size and qualifications, skills and experience of the inspectorate. In particular, OCIM needs the resources to conduct both targeted campaigns and systematic auditing - the types of activities that are central to the success of 'best practice' inspection regimes found in NSW and Queensland. In addition to new appointments the skill set of existing inspectors needs to be upgraded (in the area auditing in particular). As an interim measure some use could be made of an expert consultant to assist with auditing.

8. OCIM has a constructive relationship with both industry and unions and overall the relationship between industry and unions is also mature and constructive in terms of safety. There are opportunities to build collaboration with regard to a more proactive long term improvement in safety and health standards in Tasmania. These should be encouraged. The establishment of a tripartite advisory body on mine safety would be a step in this direction. The audit stresses the importance of both employers and unions devoting resources and attention to safety and remaining alert to the lessons of history in mining – namely that all information, input and concerns relating to safety warrant serious consideration.

9. The current regulatory framework in Tasmania is deficient in a number of regards, both due to a failure to conduct a full assessment of the regulatory framework following Beaconsfield as has occurred in other jurisdictions, and due to some implications of the harmonisation of OHS legislation. The deficiencies identified in this audit are significant, including adversely affecting the capacity of the OCIM to carry out its tasks effectively. They require urgent attention. A review of mine safety regulation in Tasmania should be undertaken as soon as possible to ensure the regulatory framework accords the best practice regimes found in Queensland, NSW and now New Zealand. Borrowing from these models will be more efficient (in terms of time and cost) and will more closely align Tasmania with other parts of Australia (which itself has advantages in terms of developing systems, moving people and the like) The process could and should be facilitated (to ensure fit with local circumstances) by a tripartite steering committee.

Specific Recommendations

1. An additional inspector needs to be appointed with primary responsibility for quarrying.
2. The two posts which are vacant at the moment should be filled by applicants with mine engineering qualifications, one with specialist knowledge of coal mining and one with specialist knowledge of metalliferous mining.
3. I recommend that the process of finding replacement staff should commence as soon as a departure is known in order to minimise (ideally eliminate) the gap period between departure and a new appointment.

4. The Chief Inspector of Mines should attend the annual meeting of Chief Mine Inspectors of Australia and New Zealand.
5. I recommend that a visit of at least one week's duration to another jurisdiction with a larger mine inspectorate should be available on a two yearly basis for both metalliferous mine inspectors and any future appointments.
6. If the interregnum prior to the appointment of a qualified coal mine inspector is more than six months, an inspection by a qualified coal mine inspector from another jurisdiction, or equivalent.
7. Provision should be made for specialist expertise (notably geotechnical expertise) to be brought in on a consulting basis as required.
8. The additional training needs identified in this section, including those with regard to auditing, should be addressed
9. The adequacy of current arrangements with regard to electrical inspection should be reviewed.
10. The current organisational structure of the OCIM and location of inspectors is broadly appropriate and fit for purpose.
11. Either;
    a. Introduce a levy on the industry to fund OCIM, or
    b. allocate a set fraction of mining royalties to cover the costs of the OCIM
12. a separate salary structure be established that;
    a. for mine inspectors that better reflects the task requirements/expertise and market demand for these skills.
    b. includes two broad classifications, one for mine inspectors without mine engineering qualification and another (higher scale) for those with engineering qualification.
    c. Bases the salary of the Chief Inspector of Mines on a loading/payment additional to the higher classification to reflect their administrative/managerial tasks and greater responsibilities.
    d. is periodic benchmarked against salary levels paid in other Australian mining jurisdictions.
13. The skill set of existing inspectors needs to be upgraded (in the area auditing in particular).
14. The two engineering qualified inspectors who are most likely to be called out to a serious mine incident have access to home-garaged vehicles and this should be extended to the new qualified appointments recommended in this report.
15. Worksafe Tasmania collects data on notifiable incidents at all mines. I would recommend this information (suitably anonymised) be forwarded to unions and the Minerals Council on a six monthly basis.
16. A review of mine safety regulation in Tasmania should be undertaken as soon as possible to ensure the regulatory framework accords with the best practice

regimes found in Queensland, NSW and now New Zealand. The process should be facilitated by a tripartite steering committee.

17. It is my strong recommendation that workplace visits should form an essential element of any subsequent audit of the Mine Safety Unit and Office of Chief Inspector of Mines, Worksafe Tasmania. I also recommend that a future audit should include additional attention to quarrying, including several visits to quarries, at least one of which should be a small operation that has not been previously inspected.

REFERENCES

Bahn, S. (2013) Moving from contractor to owner operator: impact on safety culture – a case study, *Employee Relations*, 35(2):157-172.

Blank, V. Andersson, R. Linden, A. & Nilsson, B. (1995) Hidden accident rates and patterns in the Swedish mining industry due to the involvement of contractor workers, *Safety Science*, 21:23-35.

Buessing, M. & Weil, D. (2013) *Impact of Contracting on Occupational Injuries and Fatalities in Underground Coal Mining*, Unpublished paper Harvard University.

Chandler, R. (2009) *In the Matter of the Coroners Act 1995 and in the matter of an Inquest touching the Death of Larry Paul Knight: Findings Recommendations and Comments*, Magistrates Court of Tasmania Coronial Division, Launceston, 26 February 2009.

Chandler, R. (2010) *Findings, Recommendations and Comments following an coronial inquest into the Death of Adrian Bryan Hayes*, Magistrates Court of Tasmania Coronial Division, Launceston, 25 August 2010.

Department of Mines and Petroleum (2014), *Safety Performance in the Western Australian Mineral Industry: Accident and Injury Statistics 2012-2013*, Government of Western Australia, Perth.

Jones, D. (2008) *In the Matter of the Coroners Act 1995-and- in the Matter of Inquests Touching the Deaths of Jarrod Keith Jones, Mathew David Lister and Sidney Thomas Pearce*, Coroners Court of Tasmania, Burnie.

Karra, V. (2005) Analysis of non-fatal and fatal injury rates for mine operator and contractor employees and the influence of work location, *Journal of Safety Research*, 36:413-421.

Matthews, L. Bohle, P. Quinlan, M. & Rawlings Way O. (2012) Traumatic death at work – consequences for surviving families, *International Journal of Health Services* 42(4):647-666.

Melick, A.G AM, RFD, S.C. Beaconsfield Investigation Report prepared for the Coroner at the Request of the Tasmanian Government Concerning the Incident Resulting in The Death of Larry Knight and The entrapment of Todd Russell and Brant Webb Which occurred at the Beaconsfield Mine On 25th April 2006Special Investigator Derwent & Tamar Chambers 128 Macquarie Street Hobart 7000 Tasmania 28TH August 2007 http://www.magistratescourt.tas.gov.au/__data/assets/pdf_file/0013/120604/Beaconsfield_Investigation_Report.pdf

Mine Safety Operations Branch, (2010), *Coal Mine Safety Audit Report*, Industry and Development NSW, Sydney.

Muzaffar, S. Cummings, K. Hobbs, G. Allison, P. & Kreiss, K. (2013) Factors Associated With Fatal Mining Injuries Among Contractors and Operators, *Journal of Occupational and Environmental Medicine,* 55(11): 1337-1344.

Parker, T. & Cliff, D. (2007), *A review of the Queensland Mines and Quarries Annual Safety Performance and Health Report*, MISHC & IHBI, Brisbane.

Quinlan, M. (2009), *Report on OHS management at the Beaconsfield Joint Venture Gold Mine, Tasmania up to and including the time of the rock fall incident at the 925 level of the mine that occurred at around 9.23pm, resulting in the death of Larry Paul Knight and the entrapment of Todd Andrew Russell and Brant George Webb* (expert report prepared for Greg Melick SC, Independent Investigator appointed by the Tasmanian Government), 30 August 2007.

Quinlan, M. (forthcoming), *Ten Pathways to Death and Disaster: Learning from Fatal Incidents in Mines and Other High Hazard Workplaces,* Federation Press, Sydney.

Risbey, T., de Silva, H., & Tong, A. (2007). *Road crash cost estimation: A proposal incorporating a decade of conceptual and empirical developments*. Canberra: Bureau of Transport and Regional Economics, Australian Government.

SIA Professional eNews, Issue 209, 4 March 2014

Stewart, P., Vermeulen, R., Coble, J., Blair, A., Schleiff, P., Lubin, J., Attfield, M. and Silverman, D. (2012) 'The Diesel Exhaust in Miners Study: V. Evaluation of the Exposure Assessment Methods', *Annals of Occupational Hygiene*, 56 (4):389–400.

Walters, D. Johnstone, R. Frick, K. Quinlan, M. Gringras, G. & Thebaud-Mony, A. (2011) *Regulating Work Risks: A comparative study of Inspection Regimes in Times of Change,* Edward Elgar Cheltenham, UK.

Walters, D. Wadsworth, E. Johnstone, R. & Quinlan, M. (2014) *A study of the role of workers' representatives in health and safety arrangements in coal mines in Queensland*, Report prepared with support of the CFMEU, Brisbane.

Workplace Health and Safety Amendment (Mine Safety) Act 2010;

Workplace Health and Safety Amendment (Mine Safety) Regulations 2011

Wran, N. chair (2005) *NSW Mine Safety Review*, Department of Primary Industry, Sydney.