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Opportunities for Improvements in Safety and Health Management Systems for Coal Mines - An Auditor's Perspective

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OPPORTUNITIES FOR IMPROVEMENTS IN SAFETY AND HEALTH MANAGEMENT SYSTEMS FOR COAL MINES - *AN AUDITOR'S PERSPECTIVE*

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ABSTRACT: Auditing of Safety and Health (or Health and safety in NSW) Management Systems (SHMS) is an integral and essential process to make sure that an operation demonstrates an understanding of legislative requirements and complies with both the written law and its intent.

Auditing SHMS in both NSW and Queensland has come a long way since the implementation of updated mining safety legislation that mirrors or relies on parent Workplace Health and Safety (WHS)or Occupational and Health Safety (OHS) laws. Intrinsic in this is the application of relevant Australian Standards on SHM and Quality Management.

The audits in use may not fully address these parameters, and this paper attempts to identify some of these concerns, and hopefully suggest some areas for improvement in the systems and their auditing.

The material for this paper comes from both the author's experience, and experience of other external auditors including members of the inspectorates in both states.

INTRODUCTION

The author has been involved since 1998 in the development, implementation and auditing of Safety and Health Management Systems (SHMS) in mine and compliance management roles, and has a concern that many organisations may not fully understand the depth or intent of legislation as it applies to a site.

The material presented is the personal opinions of the author, and does not reflect the corporate views of any organisation. It is the result of a number of years of analysis of legislation, preparation of systems, training and auditing. The paper is an attempt to assist others to reach understanding of the range of options for auditing of SHMS at mines, and points out what the author believes are commonly found opportunities for improvement in this process.. These opportunities are not specific to any organisation or any mine, but a gathering of data from the author and many other auditors working in this field.

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BACKGROUND

The Operator's audit is a requirement of the Queensland Coal Mine Safety and Health Act 1999 section 41(1) (f) as part of the "Obligations of coal mine operators", in this case to "audit and review the effectiveness and implementation of the safety and health management system to ensure the risk to persons from coal mining operations are at an acceptable level".

Under the New South Wales Coal Mine Safety and Health Act 2002, the requirement is stated in section 23 "Contents of health and safety management system", specifically subsection (3) (a) "system elements which must include … system evaluation".
Neither legislation specifies the need for external auditing, nor sets periods for such audits. Auditing and review are key elements of a Safety and Health Management System under the referred Australian Standard 4801:2001.

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In 2007 in Queensland it was recognised that the operators audit had been approached in many different ways that in most cases was not in agreement with the Inspectorate view. To attempt to get some alignment, a series of meetings and communications was implemented to set some concepts and standards to this process. Along with the Inspectorate, representatives of the coal holders and operators and the external auditors being used at the time agreed on a range of auditable elements of the systems that could be used to show the effectiveness of and continuous improvements in the systems. From this was created the Queensland Guidance Note (QGN09) "Reviewing the Effectiveness of Safety and Health Management Systems". In that document key system elements are identified as:

- Change management
- Work force involvement
- System performance: lead and lag indicators
- Causal analysis: repairing defences
- Audit and inspection findings
- Contractor safety and health
- Chronic exposures causing incapacity

Note that the Guideline does not mention "compliance" or "implementation" in its title. Auditing of these elements is discussed later.

SOME EXPERIENCE TO DATE

The responsibility for operator's audits in Queensland had been left to each site until 2006, either by way of the Site Senior Executive (SSE) appointing an internal or external auditor or by the operator's SSE doing the same for contractor operated sites.

In NSW the arrangements for audits have been at the discretion of the senior site management, and have used both internal and external personnel.

The difference between "compliance", "implementation" and "effectiveness" was not well recognised, so that most audits concentrated on achieving technical legislative compliance by having SHMS documentation that addressed every item to the standards required by that legislation.

Since then, it has been recognised that "implementation" is the process of system production, training personnel and embedding procedures into the workplace to ensure that all workers comply with those requirements. Further to this, "effectiveness" is the measure of how reducing risk to acceptable levels and creating continuous improvement has been developed.

Discussions across the industry and personal experience of the author have led to the conclusion that achieving consistency in approach and results is still problematic.

DEFINITIONS FOR AUDITING CONCEPTS

The following are not in any way legal definitions, but the author's attempts to identify the difference between the terms, so that ways to measure these for auditing may be developed.

Compliance

Those things that are required to meet the detail of the legislation such as:

- The combination of documentation, equipment and procedures that address the matters described by the legislative element.
- inclusion of risk management, technical analysis, and acquisition standards.
- "If the law states that you need three of something, and they are to be painted green, then compliance is reached when you can show you have three green painted ones."

Further detail is given Table 1

Implementation

Those things that are required to put the implementation into effect such as:

- The processes to train, assess, construct, maintain and use or otherwise deal with the procedures, equipment and materials that will be needed to achieve the total workforce understanding and usage of the risk control measures required for the particular legislative requirement.

"The workforce understands the need for the three green things, knows how to use them and maintain them, knows where they are to be used and when, and understands how they will reduce risk to acceptable levels.

Further detail is given in the Table 2.

Table 1 - Measures for Compliance

Indicator	Criteria
Legislation identification	• Relevant legislation identified • Legislation update process in place • Management team involvement
Legislation analysis	• Legislation analysed for compliance requirements • Management team involved • Compliance tracking tool used • Corrective action system used
Legislation included in SHMS	• SHMS addresses all legislation
SHMS compliant with legislation	• SHMS elements comply with legislative requirements
Additional referred documents identified	• Referred and referenced documents in legislation identified • Update process in place • Management team involvement
Additional referred documents analysis	• Documents analysed for compliance requirements • Management team involved • Compliance tracking toll used • Corrective action system used
Additional referred documents included in SHMS	• SHMS addresses all referred documentation
SHMS compliant to additional documentation	• SHMS elements comply with documentation requirements

Effectiveness

"The measurement of the result of compliance and implementation, which is the demonstrated lowering of risk to acceptable levels for that element of the legislation"

- Detailing the key performance indicators or other descriptors that will be used to show that the risk controls are fully implemented and are having a positive effect on the safety and health performance of the site.
- These may include reactive and proactive measurements, cultural surveys, audits, investigations, feedback or other measures determined by the mine management.
- The three green things have improved the Total Recordable Case Frequency Rate (TRCFR) by preventing incidents, the workforce has stated that they value them and audits show that they are used and maintained.

Table 2 - Measures for Implementation of the SHMS

Indicator	Criteria
Legislation	• Process to identify applicable legislation, including compliance registers and updates • Appropriate training and communication systems for all personnel
Consultation and communication process	• Formal documented system • Entire workforce coverage • Records of topics • Records of attendance • Absentee follow up • Includes process to manage concerns and objections
Risk Management System	• Complies with standards • Multi levels including broad brush, personal, team and site wide • Directs use of hierarchy of controls • Written acceptable risk limits • Training in risk management to appropriate persons and suitable skill levels
Contractor Management Plan	• Covers all contractors, consultants • Thorough pre-use review process • Induction covers all legislation
Change Management System	• Multi levels • Justification required • Formal documented system
Hazard and inspection reports	• Covers statutory and enterprise requirements, range of types • Based on situational risk • Risk based actions, both immediate and follow up • System to follow up and close out • Supervisors reviews
External Information System	• Formal documented check sheet system • Appropriate analysis system • Action planning and follow up • Dissemination system • Archive system
Action Planning and Process	• System to allocate actions, responsibility, timetable, and follow up / escalation process • System to review and close out
Incident Management System	• Formal documented system / template • Includes near miss, hazard reports and suggestions • Includes health and safety • Covers all data requirements • Detailed incident analysis leading to appropriate and accurate root causes • Action requirements / taken system based on risk • Communication strategy • Training of appropriate personnel to suitable standards
Supervision management	• Formal documented system • Based on situational risk • Appropriate documented reports include actions taken and required

Further detail of the measurement of the above concepts is presented in Table 3.

COMMON AREAS FOR IMPROVEMENT IDENTIFIED

The following items have been noted in audits as commonly being less than adequately handled in many safety and health management systems. These are listed in alphabetical order and no priority is given to any item as the author believes they have equal value to the whole SHMS.

Change management

The SHMS should include a formal documented process for management of change including;

- Risk based approach that evaluates business needs, benefits and resource requirements
- Action planning and tracking process
- Appropriate levels of management sign off
- Auditing of results for implementation and effectiveness

Acquisition, tracking and implementation of externally sourced safety and health information

The SHMS should include a formal documented process including:

- Sourcing of information – incident reports, safety alerts, notices from various authorities, inter-company and Original Equipment Manufacturer (OEM) releases, internet sites especially inspectorate
- Logging of receipt of information and use of tracking sheet
- Contents of tracking sheet including allocation of responsibilities for assessing, using and disseminating
- Determination of any actions required, implementation into action planning process, change management considerations
- Close out by senior management including filing process

Actions and controls under HSMS to match perceived or actual level of risk

This applies to any actions or controls applied from risk assessment, accident or incident action plan, and remedial action plan from inspections or external notifications so that,

- Criticality of matching level of control with level of risk
- Use of hierarchy of controls strictly in response to levels of risk
- Extreme risks require elimination or substitution controls only
- High risks require engineering solutions or higher
- Actions and controls need to be audited for completion and effectiveness

Action plan allocation and tracking to auditable close out by:

- Use of software systems that are document controlled
- Actions must be allocated to an appropriate person, not a position
- Actions must have a time frame relevant to the actual or perceived risk
- Actions must be tracked and reported on a regular (monthly?) basis
- Incomplete actions must escalate up the management tree
- There must be demonstrable and auditable close out of all action plans

Real root cause analysis of incident, accident and health reports to identify and action controls for repetitive trend events so that:

- All accidents and incidents must be investigated to a root cause or causes
- Causes must be relevant to the actual incident or accident, not generic
- Data logging into major causal types is essential to identify trends, and establish repetition of incidents for higher level analysis and action
- Health considerations are critical, including long and short term health effects of workplace and work conditions
- Actions identified to be managed by action planning process and to be relevant to risk

Table 3 - Measures for Effectiveness of the SHMS

Indicator	Criteria
Annual S and H planning and implementation process	• Formal documented system • Includes previous performance • Addresses areas for improvement • Uses consultative process to develop • SMT input and acceptance • KPIs developed to measure results of programs
Action and Control Risk Evaluation	• System includes methods to measure effectiveness of actions to address original problem and reduce risk • KPIs developed to measure results of programs
Consultation and communication process	• Communications address actual or perceived risk levels • System includes methods to measure effectiveness of actions to address original problem and reduce risk • KPIs developed to measure results of programs • Workforce concerns addressed in timely and risk based manner
KPI measurement and performance	• Range of proactive and reactive KPIs developed and used • KPIs to demonstrate continuous improvement
Health management	• Formal documented system to identify health matters • Systems to measure and monitor • Notification to affected workers • Follow up systems including medical testing
Training system	• Refresher training in statutory matters fully addressed • Records kept to demonstrate
Workforce feedback	• System to obtain, record, evaluate, action and follow up workforce feedback • System includes methods to measure effectiveness of actions to address original problem and reduce risk • KPIs to show use and results
Previous audits	• Documentation showing previous audit results have been analysed, actioned and followed up • System includes methods to measure effectiveness of actions to address original problem and reduce risk • KPIs to show use and results

Demonstration of effective communication and consultation processes including the following:

• Understanding the difference between communication and consultation and where each is to be used
• Consultation to be appropriate to the matter at hand, including use of affected workforce
• Consultation is not necessarily consensus
• Understanding the difference between communication and training and where each is used
• Types and levels of communication/training to be derived by a risk based approach
• Where risk levels are high communication should be formal training with assessments
• All communication processes that have a safety or health base should have recorded attendance

- It is essential to record absentees (including management) for follow up communication sessions
- Venues for communication must reflect ability of attendees to receive and absorb data – comfort, seating, acoustics, displays, etc
- Regular auditing of sessions is needed to make sure entire workforce receives the message
- On the job challenge tests are warranted for testing effectiveness of communication

Handling of reports on hazards, especially written reports including:

- The process must break the "tick and flick" sign off cycle that is common for inspection reports, especially where a defect or hazard is identified but no actions listed or recommended
- Deputy / Open Cut Examiner (OCE) reports frequently do not have actions for hazards identified or signed off as completed.
- Consider revision of inspection reports to include actions taken, actions required, assessment of urgency, etc, and a procedure to put uncompleted hazards into the action planning process
- All supervisory personnel should complete inspection reports, whether required by law or not, as a standard to demonstrate duty of care
- All hazards not addressed at the time of report should go onto action planner system to capture, track and close out

HSMS annual planning and implementation process so that

- A formal HSMS planning and implementation process is recommended
- The plan should include a combination of reactive and proactive measures that address the safety and health history of the workplace, not necessarily the industry as a whole.
- Each element on the plan should have a justification that can be demonstrated based on site history or workforce input
- Each element should be costed, evaluated by a management of change method and subject to a benefit analysis.
- HSMS planning and implementation is a responsibility of all management and supervision. It should have input from the whole workforce, via the Safety Committee, Site Safety Representative / Check Inspector. The role of the workers representatives in this matter cannot be overstated; it is possibly the strongest test for effectiveness of a SHMS.

Some key points that a SHMS auditor may consider

The following material details specific considerations for these audits, based on input from the Inspectorates and external auditors in both states and from personal audit experience.

- Is there a system at the mine to reduce risks to an acceptable level?
- How does the system plan and express this target?
- Does the SHMS set measurable acceptable limits (e.g. by use of a risk matrix) for managing risk or does it rely on "as low as reasonably achievable"?
- Is the system complete, controlled and accessible to all workers?
- Are all coal mine workers including contractors, consultants, visitors effectively covered by the system? How is this coverage demonstrated?
- Are concerns, objections and other matters raised by the workforce dealt with by a recorded process to investigate and action?
- Is the consultation process wide ranging, implanted, demonstrated and recorded? Are all groups of affected workers represented in the consultation process? Is a Safety Committee used? Is there consultation with site and industry safety and health representatives?
- Is the communication process in place and is it responsive to level of risk? Is the communication passive, active or a combination? Can the communication process be shown to be effective? Is the attendance of all workers and others captured by the communication system? What is the communication catch up process for absentees?
- Is there a system to capture, track, analyse and implement measures from externally sourced safety and health information such as legislative changes, incident reports, OEM releases?
- Is there an imbedded management of change process that is consistently and appropriately applied at all times by all persons? Can this be demonstrated? Is it based both on business need and risk management processes?

- Is there a documented corrective action process that is fully utilised, followed up, closed out, and reviewed for effectiveness of actions?
- Is there an effective accident, incident, near miss and hazard reporting system (including safety suggestions) that can be shown to have investigation and reporting relevant to risk, root cause analysis, trend analysis, action planning and prioritisation related to risk, close out and reporting processes and internal and external dissemination processes relevant to risk?
- Does this system look at other health matters such as occupational diseases, overuse syndrome, health issues such as stress related illness, etc?
- Is there a documented management system for potentially chronic exposures that may lead to disability / incapacitation? How were the exposures determined? What risk management is used? What monitoring is used?
- Is there a hazard identification system in place that covers the range from broad brush to task detail by multi level tools such as Stop, Look, Assess (SLA) and Manage, Job Safety and Environment Analysis (MJSEA), Workplace Risk Assessment and Control (WRAC), etc, and are these used in the right contexts?
- Is the formal hazard identification, risk analysis and control implementation process to an acceptable standard, are procedures written from and related directly to risk management processes, can it be shown to be fully implemented across the entire workforce, are controls related to the hierarchy of controls, are the controls fully implemented by way of action planning process and measured for effectiveness and sustainability, is the documentation fully completed and accessible?
- Are there risk based triggered action response plans in place for a wide range of events based on site wide risk assessments? Are all personnel fully trained in crisis and emergency response and are there exercises conducted to a plan to demonstrate effectiveness?
- Is the Training Management Plan in place and fully implemented? Does it have a needs analysis that includes hazard identification, risk management and related topics to a suitable standard? Are all legislative matters captured in the plan? Is the refresher training covered adequately? Is the record system up to date?
- Is there an inspection and supervision management system in place that is based on legislation and risks identified for example from a broad brush risk assessment? Is the supervision trained and competent to identify and manage risk to an acceptable level? Can the effectiveness of supervision be demonstrated?
- Is there a system of leading and lagging indicators that can show continuous improvement related to the implementation and effectiveness of the SHMS? How were the indicators developed and justified?
- Is there a formal annual planning process that includes the results of mine Safety and Health performance, audits and reviews of the SHMS and sets targets for the mine planning/budgeting process, including resources? Are these targets shown to have justification e.g. based on risk? Can workforce involvement in the plan be shown?
- Have previous audit results been demonstrably used as triggers for reviews, and have the audit results been assessed for use in the improvement process?
- How is the management responsibility for audit and review of the SHMS handled? What are the triggers for management audit / review? How are the outcomes recorded, handled and communicated?
- Are the system and its implementation driving a culture that looks to proactively reduce risk to acceptable levels and in particular prevent recurrence of incidents?

FUTURE DIRECTIONS

The following strategy is appropriate for the future audit needs:

1. All compliance, implementation and effectiveness audits should be combined and handled internally by personnel who are selected and trained for these roles, and have suitable time allocation to prepare, conduct and report these matters. These audits can be broad brush, in that they address the entire legislative area for the site, or selective to drill down into individual elements that may be of concern for the site or industry as a whole.
2. External auditing can be done to verify the process, but should be limited in scope for each audit and not necessarily involve all sites and all system elements.
3. The audits should use prepared worksheets detailing audit requirements for each element, which are technical compliance, implementation and effectiveness. These would be produced by

consultative process using suitable external and internal legal, safety and health and compliance personnel, and reviewed by senior management before use.
4. It is essential that sites are given audit templates and guidance instruction well in advance of the actual audit, so that they can apply appropriate resources to preparing the material required.
5. The same standard of audits should be applied at all sites, whether operated by owners or contractors, and to include related off-lease sites where applicable, such as external train load outs, waste dumps, etc.
6. Given that the range of material to be audited in too large to handle annually, and that there is no legal reason to do so, it would be sensible to target areas of the systems each year on a risk based approach and on actual site incident histories if applicable. Reviewing results of previous audits is also warranted.
7. It is important for the auditors to provide guidance and assistance where practical in the implementation of suggested improvements. This provides some consistency in approaches taken but is obviously restricted by available time.

CONCLUSIONS

Industry examples have shown the high cost to the business of not having an effective safety and health management system in place. There is a significant opportunity for organisations to mitigate this risk by careful application of the legislated requirements for review and auditing.

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The views expressed in this paper are those of the author, and do not purport to have any relationship to any coal mining operation, operator or mining company.

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