



MEX-01

Explosive management system audit checklist

Metalliferous and extractive mines and quarries



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MEX-01 Audit checklist for explosives management systems

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More information

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This publication provides a general summary of some of the provisions under the legislation (including the *Work Health and Safety Act 2011*, the *Explosive Act 2003*, *Explosive Regulation 2013*, any other Act containing requirements relating to mine safety and any regulations and rules under those Acts) as interpreted by the Department of Trade and Investment, Regional Infrastructure and Services at the time of writing (September 2014). Compliance with the Act and its subordinate legislative instruments is a legal requirement.

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Introduction

NSW Trade & Investment Mine Safety has the responsibility of promoting high standards of safety in the NSW mining industry and ensuring compliance with legislation. This requires mines to manage activities in such a manner as to identify and assess risk to the safety and health of people at their mines and to deal with risks on a priority basis.

The use, storage, manufacture, security and transportation of explosives on mine sites are high-risk activities. NSW Mine Safety audits explosive management systems at metalliferous and extractive mining and quarrying operations that use explosives. The audits will assist mines in systematically examining blasting operations to ensure conformance with legislative requirements while meeting community expectations.

To achieve this outcome, the department has developed this *Audit checklist for explosive management systems*. NSW Mine Safety plans to use the checklist during explosive management system audits at metalliferous and extractive mining and quarrying operations. The audit checklist is available on the department's website, www.trade.nsw.gov.au/minerals/safety

It is envisaged that mines and quarries will audit their blasting operations to identify the extent and effectiveness of their explosive management systems, as well as identify and deficiencies or non-compliance. This should include developing corrective action plans to address any deficiencies or non-compliance identified during the audit process.

About the Audit checklist for explosives management systems

1. The *Audit checklist for explosive management systems* has been developed to assist people conducting audits of explosive management systems at metalliferous and extractive mining and quarrying operations in NSW.
2. The checklist can be used to identify the existing level of performance in explosive management at mines and quarries through:
 - the assessment of compliance with explosive legislative requirements including the *Explosive Act 2003* and *Explosive Regulations 2013*, *Mine Health & Safety Act 2004* and *Mine Health & Safety Regulation 2007*– including compliance with AS 2187.1 Storage, AS 2187.2 Use of Explosives, AS 4326 The storage and handling of oxidising agents and the Australian Explosive Code
 - evaluation of the effectiveness of existing explosive management system in place at mines and quarries
 - the identification of strengths and weaknesses
 - the provision of an opportunity to improve the explosive management system at mines and quarries.
3. The checklist is laid out with a number of questions that can be asked to determine the extent to which the audit criteria are fulfilled. The notes in italics below each question are areas that the auditor should review and consider to verify the audit evidence provided by the auditee.
4. The three columns headed Doc, Int and Obs refer to Documents, Interview and Observations respectively. A tick should be entered in the applicable column that supports the type of evidence supplied during the audit process, that is if the evidence is obtained during an interview then the Int column should be ticked to show that the evidence was obtained during an interview.

5. The column headed **Audit observations – comments** is to be used to record the audit results and evidence obtained during the audit process and to assist when writing up the audit report. This can include records, statements of fact or other information that is relevant to the audit criteria and is verifiable. An audit notebook can also be used to record the audit results and evidence.

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
1.	<p>What systems are in place to ensure people handling explosives, and explosive precursors, hold a security clearance that is in force? Or, in its absence, what systems are in place to ensure that such a person is under the supervision of someone with a valid security clearance?</p> <p>Consider:</p> <ul style="list-style-type: none"> • The mine security plan to record all people working at the mine who hold a security clearance, with records to include security clearance expiry date • That regular checks of the mine security plan are undertaken to ensure they are up to date • That procedures are in place to ensure people not holding security clearances are under the immediate supervision of a person holding a current security clearance. <p><i>(Handling includes the activities of conveying, manufacturing, processing, possessing, using, preparing for use, treating, dispensing, storing, packing, selling, supplying, importing into the state from another country, rendering harmless, abandoning, destroying and disposing.)</i></p> <p>Refer to Explosive Act 2003 Sections 6, 6A, Explosive Regulation 2013 Clauses 9, 10 and 71 MH&S Regulation 2007 Clause 55.</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
2.	<p>What systems are in place to ensure all security clearances and licences required under the <i>Explosive Act 2003</i> and <i>Explosive Regulation 2013</i> are in force and readily available if demanded by a police officer or an inspector?</p> <p>Examples:</p> <ul style="list-style-type: none"> • security clearance • BEULs • licence to store • licence to manufacture • licence to transport (on a public road only) • licence to use security sensitive dangerous substances (such as ammonium nitrate – AN) <p>Notes: A security clearance and/or licence must be produced if demanded by an inspector or a police officer. (If not available then the licence, security clearance, or a copy of the licence or security clearance, must be produced as soon as practicable - but not more than 48 hours after the demand).</p> <p>Refer to <i>Explosive Regulation 2013</i> Clause 109</p>				

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3.	<p>All licences and security clearances have general conditions attached to them. Additional conditions may also be placed on them. What systems are in place at the mine to ensure all conditions on licences and security clearances are being complied with?</p> <p>Examples:</p> <ul style="list-style-type: none"> • Licence or security clearance holder may not have notified WorkCover NSW of a change of address, employer or other details within 14 days of any change. • A BEUL licence may have a condition that relates to one site or type of blasting activity e.g. limited to underground or surface operations at a particular mine. <p>Refer to <i>Explosive Act 2003</i> Section 14</p>				
4.	<p>What system is in place to ensure a register is maintained identifying all people working at the mine who hold licences or security clearances under the Explosive Act 2003?</p> <p>Check for the following:</p> <ul style="list-style-type: none"> • Register includes full name, DOB, licence number, expiry date and any condition/s on the licence • All information in register is up-to-date and accurate. <p>Refer to <i>MH&S Regulation 2007</i> Clauses 56</p>				

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5.	<p>How does the operator of the mine ensure that, in assessing risks associated with the handling of explosives at the mine, the WHS risk assessment for the mine takes into consideration, but is not limited to, the following:</p> <ul style="list-style-type: none"> a) the loading and stemming of blast holes b) the connection of initiation systems c) exclusion zones d) dealing with misfires e) the initiation of explosives or explosive precursors by an electric charge f) the security of explosives and explosive precursors g) the storage and transport of explosives and explosive precursors h) working in and around the edge of quarry benches i) destruction of defective and/or surplus explosives – accurate records shall be kept of quantities of explosives destroyed, and the destruction methods employed <p>Refer to <i>MH&S Regulation 2007 Clause 41</i> and <i>AS 2187.2</i></p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
6.	<p>Are blast management plans prepared and authorised by competent people before blasting operations start?</p> <p>Has a risk assessment been used in the preparation of blasting plans?</p> <p>Check for the following</p> <ul style="list-style-type: none"> • competent people involved in blasting process • life cycle approach – design to initiation & review <p>Consider:</p> <ul style="list-style-type: none"> • foreseeable hazards have been identified and assessed • hazards have been eliminated or controlled • blast exclusion zone clearly defined • blasting equipment fit for purpose • no sources of ignition near explosives • sleeping shot security arrangements • security procedures for site and blast, including explosives • effective systems in place to reconcile/record all explosives used in all blasting activities-eg can accurately account for every detonator/explosive product used / stored at the mine • Production Manager to review and sign off on explosive reconciliations • blast guards, notification of others, assembly area, firing location, etc <p>Refer to AS 2187.2 - Section 2 and Appendix A</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
7.	<p>What systems are in place to ensure a risk assessment has been undertaken and safe work method statements (SWMS) have been developed by blasting contractors before contractors start blasting operations at the mine?</p> <p>Check for the following:</p> <ul style="list-style-type: none"> • SWMS describe how the blasting operations are to be carried out • SWMS identify the work activities assessed as having safety and health risks • SWMS identify those safety and health risks • describe the control measures that will be applied to the blasting operations • do contractors comply with the SWMS • SWMS for destruction of defective and/or surplus explosives – accurate records shall be kept of quantities of explosives destroyed, and the destruction methods employed. <p>Refer to <i>MH&S Act 2004</i> Sections 38 & 64 and <i>MH&S Regulation 2007</i> Clause 29</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
8.	<p>What precautions are taken and what procedures have been developed to prevent access to explosives by people not authorised or lawfully entitled to have access?</p> <p>Examples:</p> <ul style="list-style-type: none"> • people who do not hold a security clearance that is in force are not able to access explosives • explosives not left unattended or secured • people under the age of 18 years • people not listed in the mine's security plan • camera surveillance of explosive storage facilities • regular random/full mine security searches for unauthorised removal of explosives from mine • competent guards, remote surveillance equipment used to monitor sleeping shots • regularly reinforce to all mine workers the need to ensure the security of explosives <p>Refer to Explosive Act 2003 Sections 7 & 9 and Explosive Regulation 2013 Clause 71</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
9.	<p>Is there a written procedure to report a theft, attempted theft, loss or an incident involving explosives or explosive precursors to the correct authorities?</p> <ul style="list-style-type: none"> • If a loss occurred were NSW Trade & Investment, WorkCover NSW and the police notified immediately? • Is there a written procedure to report a theft, attempted theft or suspicious activity involving explosives or explosive precursors to the correct authorities e.g. NSW or Federal police, WorkCover and NSW Trade & Investment? • Are systems/procedures in place to formally investigate all discrepancies in reconciliations? • Are weekly reconciliations of explosive storage facilities conducted by independent persons – e.g. reconciliations conducted by person/s other than those that have taken/booked out explosives from the storage facilities? <p>Refer to Explosive Regulation 2013 Clause 102</p>				
10.	<p>What procedures are in place to report the following explosive incidents to NSW Mine Safety:</p> <ol style="list-style-type: none"> 1. Ejection of fly-rock so that it falls outside a blast exclusion zone? 2. E? significant misfire of explosives? 3. A problem or fault in an explosive product or accessory? 4. Any loss of explosives or explosive precursors? <p>Refer to <i>MH&S Regulation 2007 Clause 145 (l) & 146 (1)-(e) and (g)</i> and <i>Explosive Regulation 2013 Clause 103</i></p>				

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11.	<p>If a security plan is required, does it contain the following minimal requirements:</p> <ul style="list-style-type: none"> • Sketch/plan of site • Has a person been nominated to be responsible for managing the implementation of the security plan? This person must hold a security clearance. • Schedule to review the security plan every 12 months • Systems in place for security of magazine/s, explosive vehicle/s and magazine keys, including maintaining a key register • Details of people supplying/receiving explosives • Up-to-date list of people with unsupervised access to explosives list of vehicles that may carry explosives • Procedures for the weekly reconciliation of explosive consumption - records maintained for five years • Records of explosives security plan training and any instructions given to employees on safe and secure handling of explosives • Procedures on who may access explosives • Other security information required by the department. <p>Refer to Workcover NSW security plan guide – security risk assessment</p>				

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12.	<p>Are the requirements, activities and procedures specified in the security plan being audited to ensure compliance?</p> <p>Examples:</p> <ul style="list-style-type: none"> • Magazine records are kept in bound books with numbered pages and duplicate copies maintained • Audits conducted of magazine records on a weekly basis by impartial persons - systems should include reconciliation of actual used versus planned use • Only person listed in the security plan to have access to magazine keys and explosives • Security arrangements are regularly reviewed when conditions/activities change e.g. need to sleep blasts • Only authorised people stated within the security plan are handling explosives • Regular searches of persons leaving mine for explosives products • Is only one electric detonator used to initiate blasts? If two are to be used is there a system in place to ensure both are always used • Are unused explosives from blasting activities returned and booked back into the magazines on the same day/shift that they are removed - with reconciliations conducted to ensure that this always occurs? • Procedures in place for destruction of defective/surplus explosives • Procedures in place for management of misfired explosives. <p>Refer to <i>Explosive Regulation 2013 Clause 70</i></p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
13.	<p>What system/procedures are in place to ensure explosive precursors and stored in a safe and secure manner?</p> <p>If explosive precursors are stored, then their storage must comply with AS 4326 and the AEISG Code of Practice for Ammonium nitrate emulsions, suspensions or gels – ANEs (UN3375).</p> <p>This may include, but is not limited to:</p> <ul style="list-style-type: none"> • separation distances to workplaces • security arrangements • spillage containment • fire protection • signs <p>Refer to <i>Explosive Regulation 2013</i> Clause 65 & 84 and General Licencing Condition 85</p>				
14.	<p>Is more than</p> <ol style="list-style-type: none"> a) 5 kg NEQ of detonating cord (500 metres of 10g/m cord) b) 2.5 kg of blasting explosives, including boosters c) 125 detonators, and d) 50 kg of security sensitive ammonium nitrate stored and kept overnight at the mine? <p>If so:</p> <ul style="list-style-type: none"> • is a licence to store held? • are the explosive magazines to AS 2187 requirements? • is an up-to-date site security plan in place? <p>Refer to <i>Workcover NSW General licensing conditions number 87</i> and <i>Explosive Regulation 2013</i> Clauses 84</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
15.	<p>Is more than 50 kg NEQ of explosives or 50 tonne of security sensitive dangerous substances, or both, being stored at the mine?</p> <p>If so, has a written plan dealing with any emergency been:</p> <ul style="list-style-type: none"> • developed and maintained • communicated to people at the site and adjacent to the site • provided to the fire brigade or the Rural Fire Service • reviewed if circumstances have changed or within five years of previously being submitted. <p>Refer to <i>Explosive Regulation 2013</i> Clause 90</p>				
16.	<p>What systems/procedures are in place to ensure that unauthorised people do not have access to explosives or explosive precursors?:</p> <ul style="list-style-type: none"> • Explosives and/or explosive precursors are not left unattended A person must not allow another person to have unsupervised access to an explosive or explosive precursor unless that other person holds a security clearance that is in force or is under the immediate supervision (line of sight) of a person holding a security clearance that is in force • Sleeping shots are secured to prevent unauthorised access • People observing any suspicious activities/behaviour around explosives report their suspicions to the appropriate authorities. <p>Refer to <i>Explosive Regulation 2013</i> Clause 101</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
17.	<p>What systems/procedures are in place to ensure that anything that may generate a fire, (including smoking) is not carried out within 10 metres of a place where explosives are being used or within 6 metres of a vehicle in or on which explosives are being carried?</p> <p>Such as:</p> <ul style="list-style-type: none"> • magazine rules • safe work procedures for explosives • site employee, contractor and visitor inductions, explosive awareness training, national competencies for explosive • non-smoking site <p>Refer to <i>Explosive Regulation 2013</i> Clauses 93 and 105</p>				
18.	<p>What systems/procedures are in place to ensure the disposal of explosives is carried out safely and by authorised licensed people and in accordance with AS 2187.2?</p> <ul style="list-style-type: none"> • Only authorised, experienced and competent people engaged in disposal of explosives • The disposal of the explosives or explosive precursors is undertaken in accordance with AS 2187.2 • SWMS for destruction of defective and/or surplus explosives – accurate records shall be kept of quantities of explosives destroyed, and the destruction methods employed. <p>Refer to <i>Explosive Regulation 2013</i> Clauses 97 and 98 and AS 2187.2 - Section 11</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
19.	<p>When transporting explosives are procedures in place to ensure:</p> <ul style="list-style-type: none"> • they are transported in accordance with the requirements of the Australian Explosive Code (AEC) • they are not liable to ignite or explode • people are not smoking within 6 metres of a vehicle transporting explosives • that when detonators and explosives are being transported on the same vehicle are they segregated as required by the AEC • unauthorised people do not have access to explosives being transported • the keys to the vehicle/carry boxes are not left unattended • carry boxes on vehicles are locked at all time when not being accessed by authorised persons • explosives and detonators are separated. <p>Refer to <i>Explosive Regulation 2013</i> Clauses 87, 92, 93 and 94, Australian Explosive Code Sections 6 & 7</p>				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
20.	<p>Are there copies of explosive legislation, standards and codes available for people to access?</p> <p>These may include:</p> <ul style="list-style-type: none"> • <i>Explosive Act 2003</i> • <i>Explosive Regulation 2013</i> • <i>Mine Health & Safety Act 2004</i> • <i>Mine Health & Safety Regulation 2007</i> • <i>Work Health & Safety Act 2011</i> • <i>Work Health & Safety Regulation 2013</i> • AS 2187 (store, transport and use of explosives) • AS 4326 (storage of AN) • Australian Explosives Code (transporting explosives) • Australian Dangerous Goods Code (transporting explosive precursors) • Blast Management Plan • Site security plan • Explosive emergency plan • Explosive procedures/ SWMS 				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
21.	<p>What systems/procedures are in place to ensure all relevant legislation, standards and codes are being complied with in regard to explosive safety management at the mine?</p> <p>Consideration of but not limited to:</p> <ul style="list-style-type: none"> • Mine Safety Management Plan • Contractor Management Plans • Explosive risk assessments and JSAs • Explosive SWMS • Explosive security plan • Blast management plans • Hazard identification systems/records • Induction contents and records • Training documentation and competency records • Inspection records • Magazine reconciliation records • Management structures • Responsibilities & accountabilities • Equipment fit for purpose • Maintenance standards and records • Explosive emergency procedures • Explosive safety rules 				

No.	Evidence to be obtained to validate the implementation of an explosive management system	Doc	Int	Obs	Audit observations - comments
22.	Other comments/issues				