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PUB15/13

WORK HEALTH AND SAFETY (MINES) REGULATION 2014

Ancillary Reports – In-service Failure of Explosion-protected Diesel Engine Systems

I, MARK I PATERSON, AO, Secretary of the Department of Trade and Investment, Regional Infrastructure and Services, pursuant to clause 131 of the *Work Health and Safety (Mines) Regulation 2014* specify that an ancillary report, using the form below, must be provided to the regulator in respect of any incident described in clause 128 (5) (i) of the *Work Health and Safety (Mines) Regulation 2014*, but only in respect of diesel engine systems.

Dated this day of 21 January 2015

Mark I PATERSON, AO
Secretary
Department of Trade and Investment,
Regional Infrastructure and Services

FORM | WHS (MINES) LEGISLATION

Ancillary report: in-service failure of explosion-protected diesel engine systems

This form is only required to be completed by operators of underground coal mines

About this form

Pursuant to clause 131 of the Work Health and Safety (Mines) Regulation 2014 the regulator has specified, by notice published in the Gazette, certain classes of incidents that require an ancillary report to be made to the regulator, the information that must be included in the ancillary report and the form of the report.

The mine operator of an underground coal mine must provide an ancillary report, using this form, in respect of any incident described in clause 128(4)(i) of the Regulation, but only in respect of diesel engine systems. That is;

the failure of the explosion-protection characteristics of an explosion-protected diesel engine system while that plant is in service in an underground coal mine.

This ancillary report is a separate and additional requirement to the initial notification of the incident using the *Notification of incident and injury form*. This report must be submitted to NSW Trade & Investment Mine Safety no later than 30 days after the incident was required to be notified to the regulator. See the *Notification of incident and injury guide* for more information about the initial notification of incidents.

The failure of the explosion-protection characteristics of explosion-protected plant while that plant is in service in an underground coal mine is not limited to failure while the plant is operating (ie turned on and running). It includes any explosion-protection characteristic failures identified during routine maintenance or overhaul, as well as those identified during use. Such failures indicate that an explosion-protected plant has been (or is likely to have previously been) operating in a non explosion-protected condition.

For explosion-protected diesel engine systems this means that the plant may have been operating in a condition that has potential to ignite an explosion of dust or gas, such as coal dust on the surface of the engine, or methane in the surrounding atmosphere. Examples of such failures include:

- the failure of an explosion-protected open joint that exceeds the specified dimensions for explosion protection
- the failure of a diesel engine system to shut down when required by the control sensors, eg loss of water in the scrubber, excessive system temperature (above 150° C), failure of engine cooling system, etc
- a catastrophic failure of the diesel engine system that protrudes external to the engine, such as turbochargers, superchargers, piston, valves, connecting rods, etc
- the failure to replace any explosion-protected component, such as a cap, plug, flame trap, gland or other like component, after carrying out maintenance activities
- evidence of thermal degradation of an exhaust filter
- looseness of any explosion-protected fixed joint (gasket joint).

1. About the mine where the incident occurred

Name of mine	
Date of incident	
Location of incident <i>(eg workshop, transport road)</i>	

2. Machine identification

MDR* or MDA*	MIR*
Machine Manufacturer	Machine Model
Machine Owner	

*MDR= Mine design registration number, MDA = Mine department approval number, MIR= Mine item registration number

3. Last inspection

Date of last overhaul (Code D) inspection		Date the failed component /part of system was last inspected or tested	
Name of person licenced to overhaul, repair or modify explosion-protected plant or, the Recognised Service Facility (RSF) number			

4. Type of explosion-protection failure

There was potential for, or there was evidence of (*tick only the most likely one*)

- Spark external to engine Flame external to engine Surface temperature to exceed 150 degree Celsius

5. Location of failure

Which part of the diesel engine system failed? (<i>tick one – root cause only</i>)		
<input type="checkbox"/> Exhaust flame trap (wet/dry) <input type="checkbox"/> Exhaust manifold <input type="checkbox"/> Intake flame trap and housing <input type="checkbox"/> Forced induction (turbo/supercharger)	<input type="checkbox"/> Engine block & cylinders <input type="checkbox"/> Intake manifold <input type="checkbox"/> Exhaust pipe/s <input type="checkbox"/> Engine head	If one of these components is selected, go to 6 below.
<input type="checkbox"/> Pneumatic/hydraulic control system	<input type="checkbox"/> Electrical control system	

6. Engine component failures

Which major component failed? <i>(tick one from this column)</i>	How did the component fail? <i>(tick one only, from the same row)</i>	
<input type="checkbox"/> Wet flame trap (conditioner)	<input type="checkbox"/> Exhaust carbon holding up floats <input type="checkbox"/> Float failure issues <input type="checkbox"/> Structural failures	<input type="checkbox"/> Water below Low water cut-out when engine stops <input type="checkbox"/> Blocked breather <input type="checkbox"/> Excessive backpressures <input type="checkbox"/> Other
<input type="checkbox"/> Fixed connection (issues)	<input type="checkbox"/> Bolts, nuts & studs <input type="checkbox"/> Gaskets <input type="checkbox"/> Thread issues	<input type="checkbox"/> Surface flatness <input type="checkbox"/> Damage <input type="checkbox"/> Other
<input type="checkbox"/> Open joints (issues)	<input type="checkbox"/> Surface flatness/finish <input type="checkbox"/> Excessive gap <input type="checkbox"/> Thread issues	<input type="checkbox"/> Bolts, nuts & studs <input type="checkbox"/> Damage <input type="checkbox"/> Other
<input type="checkbox"/> Positive flame trap element	<input type="checkbox"/> Damage <input type="checkbox"/> Excessive internal clearances	<input type="checkbox"/> Other
<input type="checkbox"/> Structural failures	<input type="checkbox"/> Fatigue/Cracking <input type="checkbox"/> Corrosion <input type="checkbox"/> Physical contact damage	<input type="checkbox"/> Catastrophic failure <input type="checkbox"/> Turbo seal failure <input type="checkbox"/> Other
<input type="checkbox"/> Excessive surface temperature	<input type="checkbox"/> Cooling system failure	<input type="checkbox"/> Other
<input type="checkbox"/> Other <i>(please specify the component and how it failed)</i>		

Now go to question 8.

7. Control system failures

Only answer this question if directed to do so from question 5.

Which component failed? <i>(tick one from this column)</i>	How did the control system fail? <i>(tick one from this column)</i>
<input type="checkbox"/> Water level sensors <input type="checkbox"/> Shutdown cylinders or solenoid <input type="checkbox"/> Cooling system sensors <input type="checkbox"/> Exhaust temperature sensors <input type="checkbox"/> Engine oil pressure sensors <input type="checkbox"/> Other circuit control valve failure <input type="checkbox"/> All or multiple sensor failure <input type="checkbox"/> Other (please specify)	<input type="checkbox"/> Valve/sensor faults <input type="checkbox"/> Wrong settings <input type="checkbox"/> Circuit contamination or blockage <input type="checkbox"/> Installed wrong <input type="checkbox"/> Loose valve/sensor mounting <input type="checkbox"/> Hose failure <input type="checkbox"/> Other (please specify)

8. Recommendations for prevention

<p>Comments on causal factors:</p>
<p>Would a design change prevent or minimise the risk of failure? <input type="checkbox"/> Yes (<i>describe how</i>) <input type="checkbox"/> No</p>

Would a **Code D overhaul change** prevent or minimise the failure? Yes (*describe how*) No

Would a **maintenance/testing/sign-off change** prevent or minimise the failure? Yes (*describe how*) No

Have you informed the manufacturer of this failure? Yes No

Add any other comments here (*optional*)

10. Statement by the mechanical engineering manager

This statement must be made by the person nominated to perform the statutory function of mechanical engineering manager.

I certify that I have reviewed the content of this report and that to the best of my knowledge the information supplied in this report is true and correct in every particular.

Name			
Contact telephone		Mobile	
Signature		Date	

Now go to the declaration

11. Declaration

This declaration must be completed, even if the person completing this form is also the person completing the certification under question 10 above.

I declare that:

- I have authority from the mine operator to complete and submit this form on their behalf, and
- to the best of my knowledge, the information provided in this form, and any attachment to this form, is true and correct in every detail.

Note: Giving false or misleading information is a serious offence under section 268 of the *Work Health and Safety Act 2011*, and Part 5A of the *Crimes Act 1900*.

Name of authorised person		Position	
Contact telephone		Mobile	
Signature		Date	

Submitting the form

→ Mail, fax or email this form to your local office of NSW Trade & Investment – Mine Safety from the list below.

→ Email notification is preferred

This form may not be submitted to other offices of NSW Trade & Investment

Hunter region:	Maitland	NSW Trade & Investment Mine Safety PO Box 344 Hunter Region MC, NSW 2321	Phone: (02) 4931 6666 Fax: (02) 4931 6790 maitland.notification@trade.nsw.gov.au
	Singleton	NSW Trade & Investment Mine Safety PO Box 51 Singleton NSW 2330	Phone: (02) 6571 8788 Fax: (02) 6572 1201 singleton.notification@trade.nsw.gov.au
Northern region	Armidale	No postal submission of forms. Email only	armidale.notification@trade.nsw.gov.au
Central Western region	Orange	NSW Trade & Investment Mine Safety Locked Bag 21 Orange NSW 2800 Phone: (02) 6360 5333	Fax: (02) 6360 5363 After-hours emergencies only: (02) 6360 5343 orange.notification@trade.nsw.gov.au
Western region	Broken Hill	NSW Trade & Investment Mine Safety PO Box 696 Broken Hill NSW 2880	Phone: (08) 8088 9300 Fax: (08) 8087 8005 brokenhill.notification@trade.nsw.gov.au
Cobar	Cobar	No postal submission of forms. Email only	cobar.notification@trade.nsw.gov.au
South Eastern region	Wollongong	NSW Trade & Investment Mine Safety PO Box 674 Wollongong NSW 2500	Phone: (02) 4222 8333 Fax: (02) 4226 3851 wollongong.notification@trade.nsw.gov.au
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