

SAFETY BULLETIN

Mobile plant - safety critical systems

BACKGROUND

This Safety Bulletin is specifically targeted at the extractive industry and is provided as a reminder to all mine operators to investigate the operation and maintenance of safety critical systems on mobile plant. Safety critical systems are critical to the safe operation of mobile plant. They assist operators to safely bring mobile plant to rest.

The components commonly referred to as safety critical items include braking systems, steering systems, warning systems, operator restraints and operator protection. Previous Safety Alerts issued by Industry & Investment NSW have highlighted several incidents where the failure of safety critical systems has contributed to fatalities and serious injuries.

The investigation of a recent near miss has again highlighted the lack of understanding and testing procedures of critical safety systems by operators, managers and mine operators.



The loader location when the loss of power occurred.



The resting position of the loader approx. 8m from the tipping position.

A front end loader (FEL) was tipping sand into a raw feed bin when the engine cut out due to a fatigued wire on the stop solenoid. As a result, the loader rolled backwards eight metres before the emergency park brake brought the machine to rest with the load still suspended.

Upon investigation it was determined that the service brake and bucket circuits were not operational in a loss-of-power situation because both circuits had

failed accumulators. The operator of the machine was helpless, despite his repeated attempts to bring the machine to a stop, until the emergency park brake activated.

While the site used original equipment manufacturer (OEM) service personnel to perform major services, there was an absence of any routine testing program to ensure the proper function of critical safety systems between services. It also became clear that personnel did not understand the role of stored energy (accumulators) in providing emergency services in a loss-of-power event.

Clause 137 (1) (c) of the *Occupational Health and Safety Regulation 2001* requires all safety features and warning devices of plant to be maintained and tested.

RECOMMENDATIONS

All mine operators should review their mine safety management plan (MSMP) to ensure:

- 1) That in assessing risks associated with earthmoving machinery the OHS risk assessment takes into consideration the failure of systems that are critical to safety (*Mine Health and Safety Regulation 2007* clause 39 (b)). This should include:
 - i) The identification of all safety critical systems on mobile plant.
 - ii) A review of OEM manuals to establish how the machine is intended to operate in a loss-of-power event.
 - iii) The development of testing procedures to ensure the machine operates in its intended manner.
 - iv) A review of MSMP documentation to ensure that it accurately reflects how the testing is to be performed.
- 2) That operators, supervisors and maintenance people involved with mobile plant are familiar with all safety critical systems, trained and competent to perform their task.
- 3) That daily prestart safety checks are rigorously carried out, including determining the proper function of the safety critical systems, eg when engine power is lost, so that:
 - i) The bucket can still be lowered to the ground.
 - ii) Service brakes activate and have designed application capability.
 - iii) The emergency / park brake applies.
 - iv) Emergency steering operates according to OEM design.
4. That operators of mobile plant are familiar with warning systems that highlight the failure of safety critical systems.

Also refer to I&I NSW Safety Alert SA06-12 *Maintenance of safety critical systems - braking, steering and warning systems* for further information.

NOTE: Please ensure all relevant people in your organisation receive a copy of this Safety Bulletin, and are informed of its content and recommendations. This Safety Bulletin should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's notice board.

Signed

A handwritten signature in black ink that reads "William Barraclough". The signature is written in a cursive style with a large initial 'W' and a long, sweeping underline.

**William Barraclough
ACTING DIRECTOR
MINE SAFETY OPERATIONS BRANCH
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