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Welding-related electric shock incidents increase

This safety bulletin provides safety advice for the NSW mining industry.

Issue

There was a substantial increase in the number of welding electric shock incidents recently reported, with five occurring in the first two months of 2019. In comparison, there were five similar incidents throughout 2018.

These recent incidents all occurred during welding activities, across all sectors of mining in NSW. A range of causes and contributing factors have been identified.

Incident 1:

A worker was using a MIG welder in a surface workshop of an underground coal mine. The worker rested the handpiece tip on his gloved hand to steady the handpiece. The worker then felt a shock in his left hand.

Figure 1: Shock while welding pipe. (IncNot0033939). Photo by NSW Resources Regulator.



Incident 2:

A fitter had washed down a dozer in a sand mine and was preparing to weld. Another worker saw the fitter positioned awkwardly so went to assist. After getting a welding glove, he held a pipe in place. The worker felt a tingle up his arm when the fitter struck the arc.

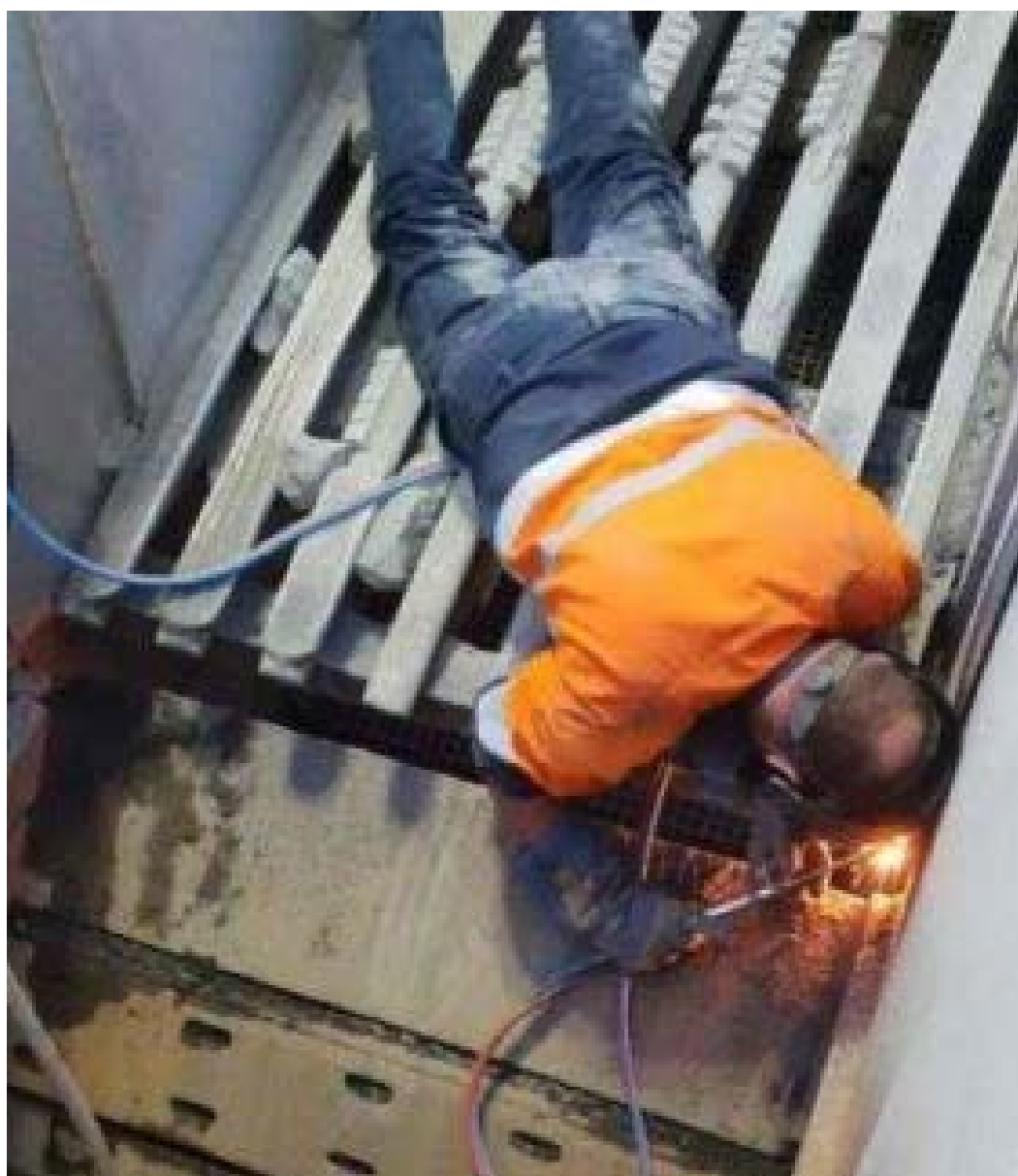
Figure 2: Re-enactment of assistant suffering an electric shock. (IncNot0033402). Photo by NSW Resources Regulator



Incident 3:

A contractor boilermaker was welding on grizzly panel in a quarry. The earth had been positioned on the opposite side of the grizzly to the area being worked on. The boilermaker was lying on the grizzly. When a programmable logic controller (PLC) code was loaded, a spray bar over the grizzly activated. The arc had already been struck, and welding was underway when the boilermaker suffered the shock.

Figure 3: The photograph was taken earlier in the day of the incident when the worker was in the same position at the time of the incident. (SInNot-2018/01982). Photo by NSW Resources Regulator



Incident 4:

A trades assistant and boilermaker were repairing a walkway. The trades assistant was holding a kick board in position to be welded. As the boilermaker struck the arc, the trades assistant felt an electric shock through the right-hand glove. The trades assistant had his shoulder against a steel column. The boilermaker had the earth return on the opposite side to the trades assistant holding the work piece.

Figure 4: Haul truck hits light vehicle (SlnNot-2018/01932). Photo by NSW Resources Regulator



Investigation

Contributing factors identified across the numerous incidents include:

- Poor PPE management:
 - holes in gloves
 - wet gloves
 - wet boots
 - damp shirt
 - sleeves rolled up.
- Welding equipment in poor condition:
 - handpiece cracked and taped up
 - poor connection between the earth and earth clamp/lead
 - leads damaged
 - inspections not current.
- Poor positioning of earth clamp.
- Failure to identify and control wet work area or water source near work area.
- Workers in contact with workpiece.

Recommendations

It is recommended that all mine operators should:

1. review their risk assessments for welding activities
2. confirm welding equipment maintenance is scheduled appropriately
3. update procedures to include a requirement that workers change personal protection equipment (PPE) and clothing as necessary to remain dry
4. have adequate supplies of PPE, welding consumables and work area controls such as screens, mats and duck boards
5. provide boilermakers with appropriate training to establish a safe earth path when setting up work areas
6. review supervision arrangements for welding work and train supervisors in the relevant controls they should be assessing for welding activities
7. review [MDG25 Safe cutting and welding](#).

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.

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