



Mines Safety

Significant Incident Report No. 142

Explosion of empty flammable containers during hot work at a demolition site

Incident

While cutting up scrap steel using oxy-propane cutting equipment at a demolition site, a labourer suffered serious burns to the head, chest and arms when hot material slag and spatter ignited an old twenty litre flammable liquid drum through a small hole in the side wall.

The drum that exploded was found to have contained epoxy thinners and was still partly filled.

Causes

- Due to lengthy exposure to the elements, the labels and markings on flammable liquid and oil drums at the site had become illegible over time. Therefore the contents of the drums were unknown in some cases.
- A waste oil contractor emptied the oil from the oil drums but refused to remove the material from the flammable liquid drums.
- Old drums had been moved from a dedicated sign-posted drum storage compound to the demolition area for disposal. Large-scale hot work was being carried out in the same area. There was no procedure for drum storage.
- No signage was displayed to warn of the danger or restrict access to the area where the drums were located within the demolition area.
- Employees who were trained in hot work procedures failed to realize the danger posed by the partly filled flammable liquid drums stored in the demolition area and therefore no arrangements were made for their removal.

Legal requirements

Under Section 9(e)(ii) of the *Mines Safety and Inspection Act 1994* (MSIA), each employer must make arrangements for the safe use, handling, processing, storage, transportation and disposal of all substances at the mine.

The handling and disposal of old drums and containers containing residual material of a flammable or explosive nature pose a significant threat of injury to employees if not carried out with appropriate precaution.

Under Regulation 4.3 of the *Mines Safety and Inspection Regulations 1995* (MSIR), the manager and each employer must ensure that personnel do not use welding oxy-acetylene cutting equipment or other hot work equipment where there is a risk of personal injury.

Regulation 7.23 requires each responsible person at a mine to ensure, so far as is practicable, a safe means of disposal is provided for empty or surplus hazardous substance containers.

Regulation 7.24 further requires each responsible person to ensure that all hazardous substance containers have an appropriate label attached to the containers at all times.

Recommendations

In light of these requirements, the Registered Manager, principal employer and every employer at each mine should therefore review and/or establish procedures for the site for the inspection, labeling, storage and safe disposal of old hazardous substance and flammable containers at the mine. With this in mind, the following recommendations are made:

- A risk assessment or JSA should be conducted prior to commencing welding cutting or other hot work in areas other than designated workshops or other areas designed and arranged for such activity.
- Old hazardous substance and flammable drums and containers need to be segregated from work areas to avoid accidental ignition or explosion occurring. Segregation distances should be similar to the distances allocated for full hazardous substance containers where practicable.
- Warning signage needs to be displayed in container storage areas with respect to any hazards associated with the old drums to ensure that no ignition sources or other potential sources of danger are introduced into the storage areas prior to disposal.
- Daily workplace inspections should be undertaken to ensure hazards are identified and appropriately managed or removed.
- All personnel undertaking hot work at a mine should be appropriately trained and informed of the dangers associated with containers containing vapours or residual amounts of hazardous or flammable substances.



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