



# Worker receives flash burns while repairing fuel tank on loader

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## What happened?

A mine worker recently received burns to their neck and arm, following a flash fire, while preparing to fix a fuel tank on a loader.

The loader was fitted with dual diesel fuel tanks on each side of the rear, which were both integrated into the sub-frame. The two tanks were interconnected by a bottom feeder line and a top breather line.

The crack being repaired was on the top of the left hand tank. Nitrogen was introduced into the top of the right hand tank.

In order to speed up the process, the crack was being prepared for welding using an air arc gouging torch, in preference to a grinder. This caused a flash fire in which the worker sustained injuries to their neck and right arm.

## How did it happen?

The fuel in the left hand tank rose up to be level with the crack due to the uncontrolled introduction of nitrogen in the right hand tank. The fuel, together with the oxygen from the air arc gouging torch created a flammable atmosphere which ignited.

## Comments

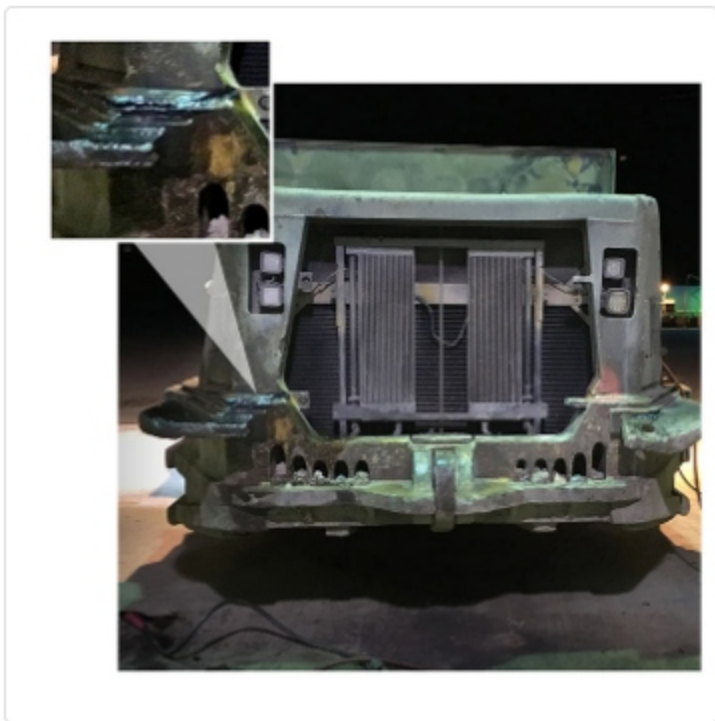
The hazards associated with welding on fuel tanks are well known but vary from one situation to another. Relying on a generic procedure is not an acceptable practice.

## Recommendations

A job safety analysis (JSA) should be developed and adhered to. In this specific situation, the JSA should at least consider the following:



- Ensuring the fuel is at ambient temperature and then isolating the tank that is not under repair.
- Draining the fuel out of the tank that is under repair and using water to flush out any residual fuel. This eliminates the risk of a fire resulting from the tank splitting during the repair work.
- Introducing carbon dioxide (CO<sub>2</sub>) into the top of the tank at an appropriate rate. CO<sub>2</sub> is an inert gas and is heavier than air and will displace any pockets of air. Using CO<sub>2</sub> may require a heated regulator.
- Monitoring the oxygen level inside the tank using a calibrated instrument and when it is less than 3% and stable, grinding or air arc gouging can start.
- Ensuring a second person monitors the oxygen level throughout the repair. Work should stop if the oxygen level rises above 3%.
- Continuing to purge the tank and monitoring the oxygen level after the repair is completed until the tank cools to below the flash point of the fuel before refilling the tank.



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Issued by the Queensland Department of Natural Resources, Mines and Energy

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