

[Home](#) > [Resources Safety & Health Queensland](#) > [Safety notices](#) > [Explosives](#) >**Ignition of fuel-air mixture from mobile processing unit discharge auger** [Print notice \(?SQ\\_DESIGN\\_NAME=print\\_preview\)](#) [Back to results](#)**Explosives Inspectorate  
Resources Safety & Health  
Queensland****ALERT | ALERT | ALERT | ALERT | ALERT****Explosives Inspectorate | Alert | No.103 V 1 | 08 September 2021**

# **Ignition of fuel-air mixture from mobile processing unit discharge auger**

## **What happened?**

A mobile processing unit (MPU) was being used to manufacture blasting explosives, blending ammonium nitrate, fuel oil and emulsion. During this operation, a flame was observed by the operator coming from the incline transfer tube. The most likely cause of the flame was identified as an ignition of diesel vapour emitting from the chute between the incline and delivery augers.

The flame was of short duration and self-extinguished before potentially causing a general kre or explosion. As a precaution, the MPU operator used onboard extinguishers to mitigate the risk of kre.

## **How did it happen?**

The authority holder's investigation of the incident found the most likely cause of the ignition was from a hot spot created from metal-to-metal contact in the delivery auger.

It was identified that the incline auger chute had contacted a discharge auger flite. The resulting friction created a hot surface with the level of heat produced by the friction in the order of  $>300^{\circ}\text{C}$ . The presence of a fuel oil (diesel), air mixture in the immediate area of the hot spot led to an ignition event.

## Key issues

The investigation identified that the lack of auger engineering design tolerances was a contributing factor combined with inadequate critical control maintenance of the augers. This resulted in metal-to-metal contact between the first flight of the discharge auger and the lower end of the incline auger transfer chute.

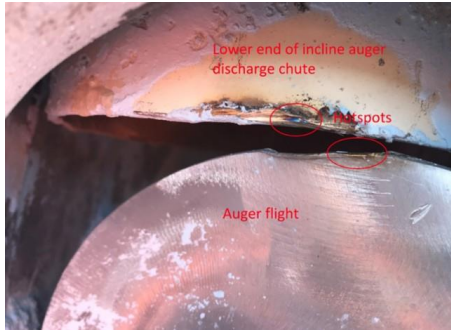
## Recommendations

To prevent a recurrence of this type of significant incident the following recommendations are made:

1. Review MPU Hazard and Operability (HAZOP) studies to ensure design specifications provide adequate component spacing to eliminate metal to metal contact.
2. Inspect existing MPU fleet critical safety components to ensure operating tolerances are within specifications where metal-to-metal contact can occur.
3. Review, and update as necessary, maintenance and inspection procedures for MPU's for critical safety components for MPU operations.

*Investigations are ongoing and further information may be published as it becomes available. The information in this publication is what is known at the time of writing.*

*We issue Safety Notices to draw attention to the occurrence of a serious incident, raise awareness of risks, and prompt assessment of your existing controls.*



## Authorised by Alex Mandl - Chief Inspector – Explosives

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