



SAFEX Webinar #4: Transportation of Explosives 19 October 2022: Session 1

SAFEX International



Program

1. **Ammonium Nitrate Vehicle Explosion Investigation**
Noel Hsu – ORICA
2. **Mobile Explosives Manufacturing Unit (MEMU) – smoke incident**
Stéphan Ruhlmann - EPC
3. **Emulsion Truck Fire**
Christo Peltz - AECl





SMOKE INCIDENT related to a MEMU

SAFEX Webinar, 19th October 2022



Agenda

1. INCIDENT FACTS
2. WHAT HAPPENED
3. IMPACTS OF THE INCIDENT
4. CORRECTIVE ACTIONS
5. SAFETY IMPROVEMENT
6. TAKE HOME MESSAGES



Incident facts

- Location: Quarry in UNITED KINGDOM
- Time: Tuesday, January 11th 2022.
- Operation in progress: During an explosives loading in a quarry
- Incident description: MEMU Operator noticed smoke coming from underneath the Auger.

Immediately activated the emergency stop button, and the smoke stopped.



What happened



❑ Matrix

❑ Ammonium Nitrate

❑ Boosters or detonators= 1 box each side

❑ Auger



What happened

Loose wires on speed sensor used for monitoring the AN auger speed



- Lack of protection
- Wires snapped from the sensor
- Domestic connector used during the incident
- Smoke due to thermal effect



What happened

- On inspection of the area, it was found that a wire to the speed sensor had broken
- The wire that was connected to the speed sensor touched the metal on the truck body, causing it to create smoke from the contact
- There was no insulation tape evident on the sensor, to ensure there was no wire to metal contact.
- It is unclear if it was ever put on or if it was loose and fell off.



Impacts of the incident

- Human: None
- Economic: 7.000 £ for 5 MEMU to upgrade
- Environment: None
- Customer: None
- Media: None



Corrective Actions

- On that truck, the sensor was replaced with a new one and tested again.
- Everything now worked correctly.
- Insulation tape was used to secure wires in place.
- All the fleet has been controlled and upgraded (industrial connectors and insulation tape)



Corrective Actions

Sensor fully covered with insulation tape



- ❑ New connector enclosed in insulating tape
- ❑ Armoured protection being investigated on trail



Safety improvement

New sensor being trialed



- Proper designed automotive connector for lorries and cars
- Implemented on the MEMU concerned and extended across the fleet
- During investigation, minor modifications perceived by operators: when issue on quarry, they could change it easily themselves
- This deviation not reported



Safety improvement: Technical details

❑ Retro fitting all other trucks with the new industrial connectors at the moment. All trucks, regardless of sensor type, are having monthly inspections to check on the insulation tape.

❑ Although swapping sensors of the same manufacturer is relatively easy, changing the sensor systems is not.

EPC UK garage gets to see each of our trucks at the workshop once a year, for its annual Road certificate renewal, and the conversion has been happening at that time. As the incident happened in January 2022, all trucks would have been seen by end of December 2022.





Safety improvement: Technical details

- ❑ For any new trucks that come in, a full PSSR is done, including labelling of hoses, pipes and sensors, to ensure we can track inspections, testing and replacement of parts throughout the life cycle of the truck.
- ❑ This will give us a record of when the truck was last checked and if everything was working correctly. This is vital to ensure our inspection regimes are robust and discover any faults before we have an issue.





Take home Messages

- **FOCUS INSPECTION ON PROTECTION OF EXPOSED WIRES**

- **MAINTENANCE AND REPAIR TRACKING**

- **MANAGEMENT OF CHANGE**
 - Not considered as a significant change
 - Small problems can escalate into major accidents
 - Creeping changes are:
 - Gradual
 - Unseen
 - Not planned
 - Difficult to monitor
 - And can result in major incidents if not controlled



Thanks to

- **EPC UK** for sharing this HIPO through
 - EPC Community
 - SAFEX Community
- **Authors :** Dave Bridge, UK
Bob Wooley, UK
Thierry Rousse, France
- **Speaker :** Stéphane Ruhlmann, France



**THANK YOU
FOR YOUR ATTENTION**