



Connecting emergency systems of LPG depots and tank trucks during unloading in Belgian LPG depots

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Setting

- **LPG distribution depots**
- **Large bulk trucks delivering LPG**
- **Unloading with truck pump**
- **Pump powered by truck engine**





Risk

- **Coupling and flexible connection are weak points**
 - In most depots flexible hoses are used
- **Truck engine is nearby ignition source**
- **Truck quickly inaccessible after LPG leak**
 - Truck emergency system inaccessible
 - Not possible to stop truck engine
 - Not possible to close truck valves



Existing safety

- **Depots have emergency stop system**
 - Close installation valves
 - Alert personnel
 - Can be activated from safe distance
- **Trucks have emergency stop system**
 - Close truck valves
 - Stop truck pump



Extra safety

- **Connection between emergency stop systems**
- **Truck emergency stop, stops truck engine**
 - And opens main electrical switch on the truck
- **If connected, truck driving is impossible**
 - truck in discharge mode



Emergency stop connection

- **Connection plug standard**
- **Fail safe**
 - Emergency stops activated if disconnected
 - No discharge possible if not connected
- **Bidirectional**
 - Either emergency stop activates the other one





Technical

- **Installation side**

- 8 and 12 O' clock pins connected by switch which is closed if truck discharge is allowed
- Detection of truck safe state via voltage measurement (against 4 O' clock pin)

- **Truck side**

- Gives 24 Vdc on 8 O' clock pin – 100-300 mA
- Detection of installation safe state via voltage measurement on 12 O' clock pin



How

- **After unacceptable risk identification by inspectorate**
- **Agreement with industry federation**
 - Transporters
 - Depots
- **Technical standard from industry itself**
- **Agreement to use this for all bulk unloading with truck pump on large trucks in Seveso depots**
 - But also encouraged in other situations
 - Not for small distribution trucks



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