

Furnace Explosion

EPSC Learning Sheet June 2021



EPSC

What Happened:

Operators tried to restart the tripped hot oil furnace of an FCC unit using a torch. At the third attempt the fire box exploded causing two fatalities.

The gas feed valve did shut very slow at the furnace trip, resulting in gas accumulation in the fire-box exceeding the LEL value.

Process Safety

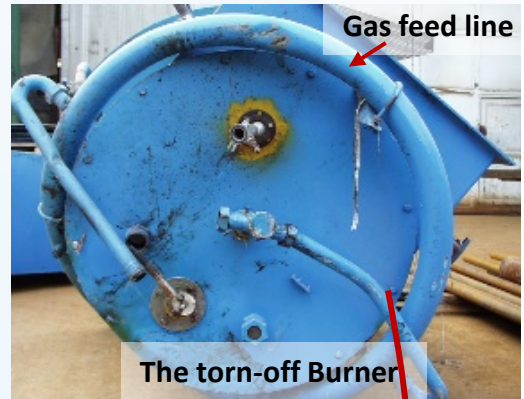
Fundamental:

Igniting
burners



Furnace
Fire box

Position of the
operator igniting
the burners



Aspects:

- Cold furnace start-up requires flushing before ignition! Here the Burning Management System (that assures flushing) was bypassed by local operation of the gas feed valves.
- Furnace start-up requires a validated practical procedure that describes actions at all possible scenario's.
- Before ignition with a torch validate that LEL is below 1%.
- Ignition from a distance using pilots is preferred.
- Limit the number of restarts (e.g. never more than 3).
- Validate that the gas feed valves closes fast and completely.

The Furnace box must be gas free before ignition!