

Furnace Fire

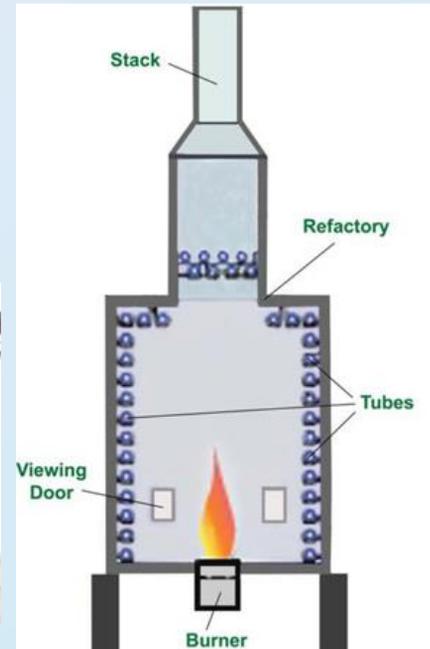
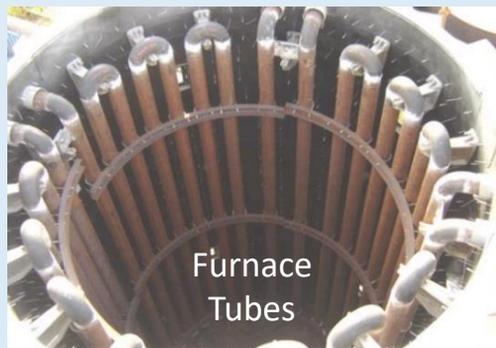
EPSC Learning Sheet , January 2018



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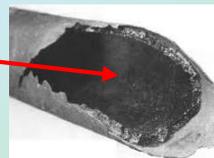
What Happened:

At refineries large furnaces are used to heat-up hydrocarbons for refining. A red hot spot was identified on a furnace tube that later ruptured. The hydrocarbons entered the furnace and created a large fire in which an operator died.



Aspects:

- The temperature in the furnace is above the design of the carbon steel tubes. Only because of the liquid flow in the tubes, the steel is cooled to acceptable temperature
- Respect the temperature window and check for red hot spots on the tubes, visually or using IR detection
- When a hot spot is detected, take the pre-defined actions
- Good burner pattern can avoid flame impingement on tubes
- Carbon deposit in the tubes can be a cause for red spots
- Temperature difference between the different tubes exiting the furnace can be a good indicator to shut down the furnace



Furnace tube rupture scenario must be well studied and protected