



U.S. Chemical Safety and Hazard Investigation Board

October 27, 2022

Sunoco Flash Fire & Explosion

Nederland, TX | August 12, 2016



Incident Overview

- Occurred at the Sunoco Nederland, TX crude oil terminal
- Aug 12, 2016, ~ 8:15pm CDT
- Flash Fire and Explosion during hot work activities (welding)
- 7 contractors injured (burn and impact injuries)



Actions leading up to incident

- **Expansion project – adding tanks and associated piping**
- **Started in April 2016**
- **Sunoco contracted L-Con for pipe fitting and welding work (for new and existing piping)**
- **Sunoco contracted CIS for project oversight and inspection services (job completion management and welding quality)**



Actions leading up to incident

- **Sunoco developed the scope of work with L-Con for which they were responsible**
- **Sunoco decided to drain crude oil (flammable) from existing piping but not to clean or inert the piping**
- **Decided that L-Con would isolate open ends of piping (that were in crude oil service) with isolation devices**



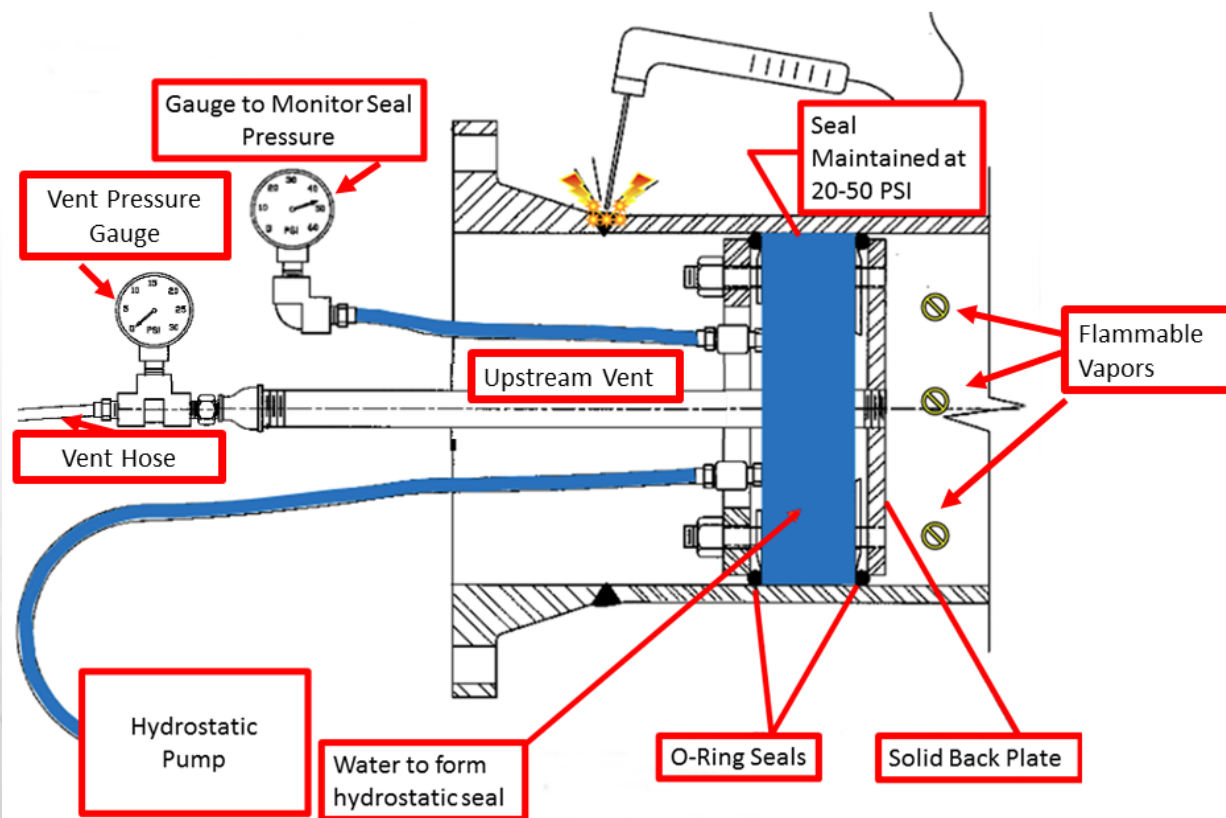
Actions leading up to incident

- **L-Con subcontracted CARBER to cold cut the piping (that contained crude oil) and install their company specific piping isolation devices**
- **CARBER markets their isolation devices to be leak free if the tool is used and monitored according to their policies/procedures**



Actions leading up to incident

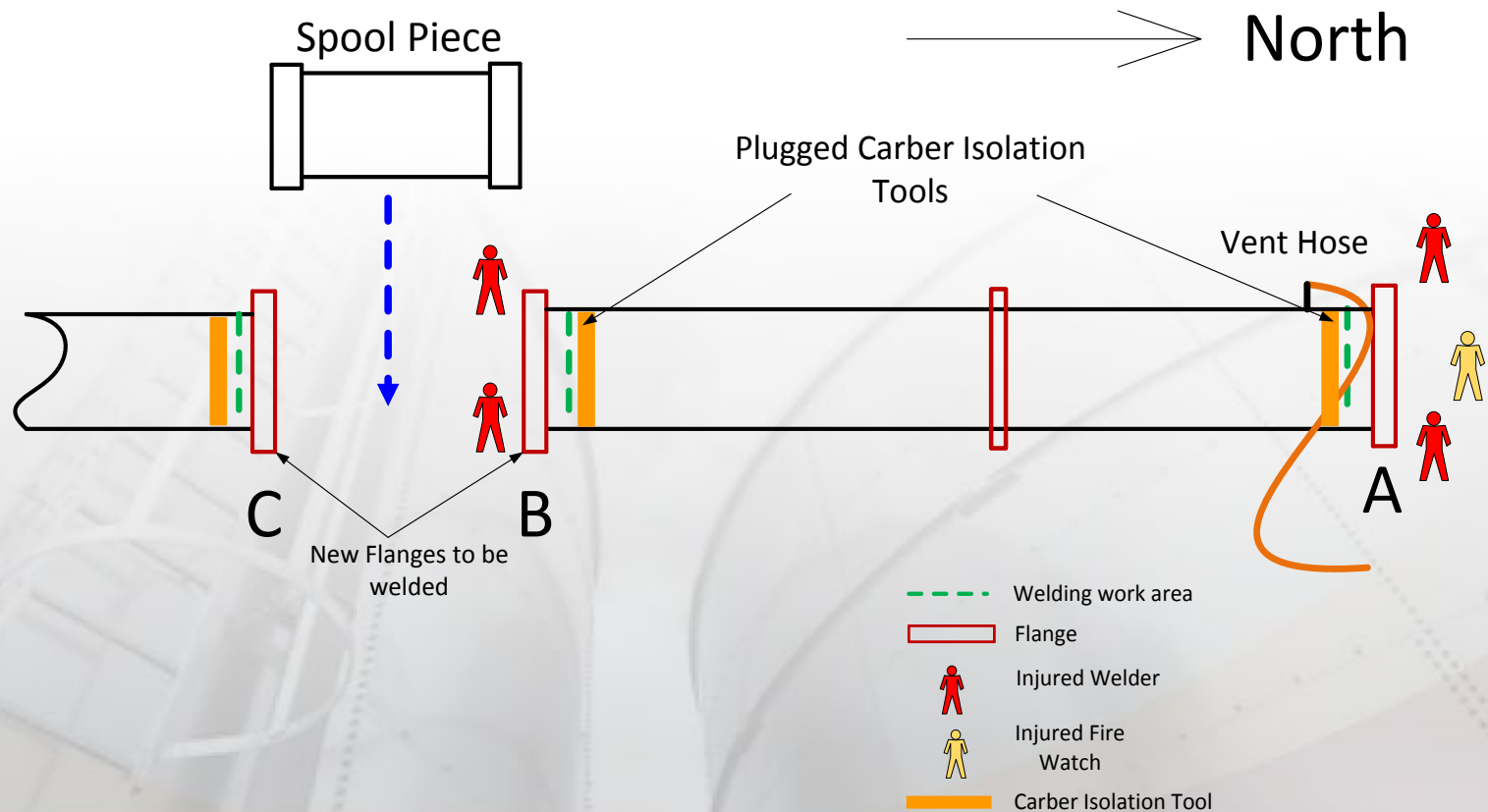
- **CARBER tool**





Actions leading up to incident

- Piping modifications





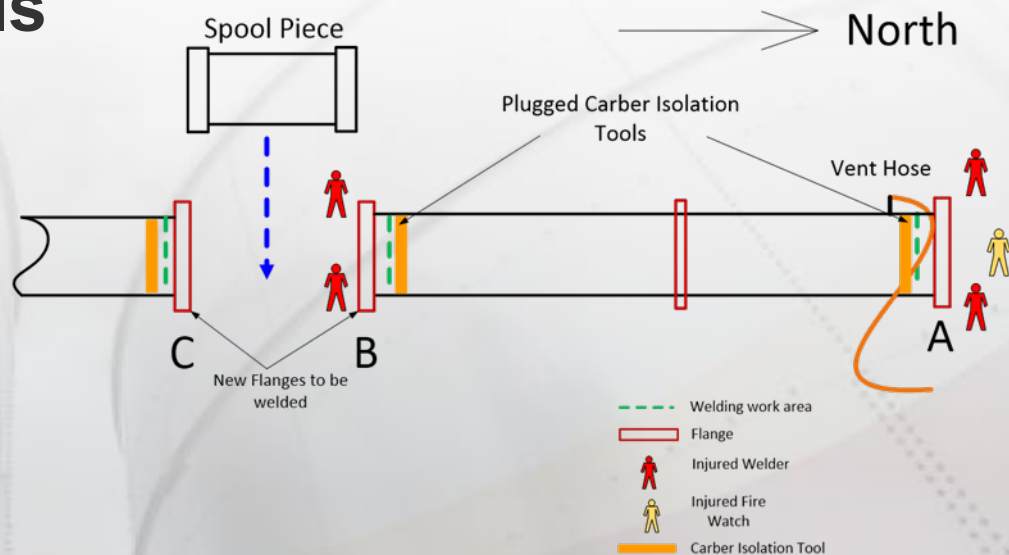
Actions leading up to incident

- **Two days before the incident**
 - Flanges on piping removed
 - Sunoco drained the pipe of crude oil
 - Left residual in the pipe – pipe not cleaned



Actions leading up to incident

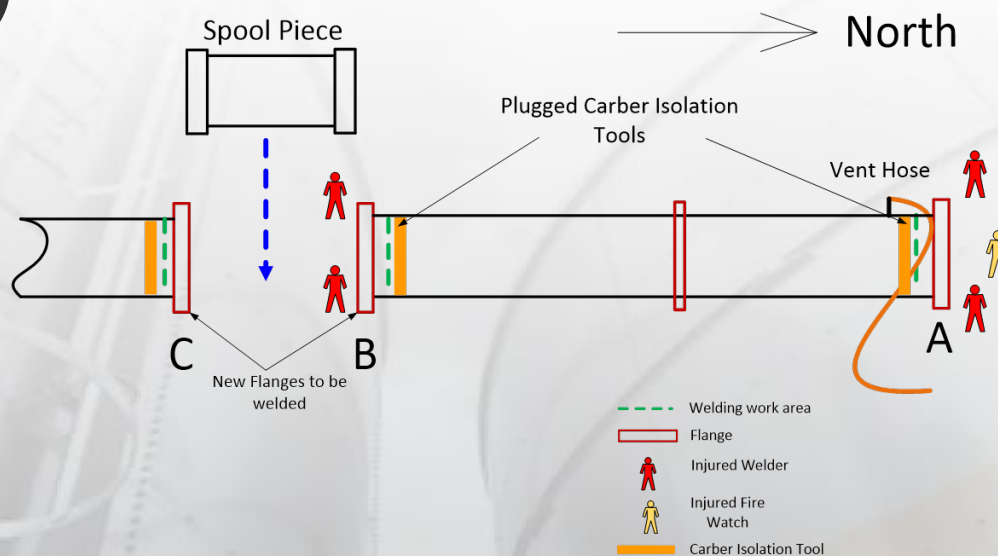
- Day before the incident
 - CARBER cold cut the pipe (due to flammability of residual crude oil in the pipe)
 - CARBER installed their CARBER isolation tools





The Incident

- To prepare for hot work, CIS (authorized on behalf of Sunoco) issued a hot work permit to L-Con to begin welding the flanges onto the piping (at location A, B, & C)





The Incident

- L-Con began welding (morning before the incident) the flanges onto the piping (outer surface of the pipe/flange)



The Incident

- **L-Con completed welding on outer surface of pipe/flange during the day shift of Aug 12, 2016**
- **After receiving the hot work permit & conducting their JSA, L-Con welders began welding the internal surface of the flanges to complete the welding job**
- **After ~15min of welding, a flash fire and explosion occurred, injuring the contractors in the area**



Identified Safety Issues

- **Per OSHA & NFPA:**
 - Hot work is prohibited on equipment that contains or has contained flammable/combustible material
 - Equipment shall be cleaned or inerted (with inert gas like Nitrogen) and tested prior to conducting hot work to ensure the atmosphere inside the equipment is not flammable



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