

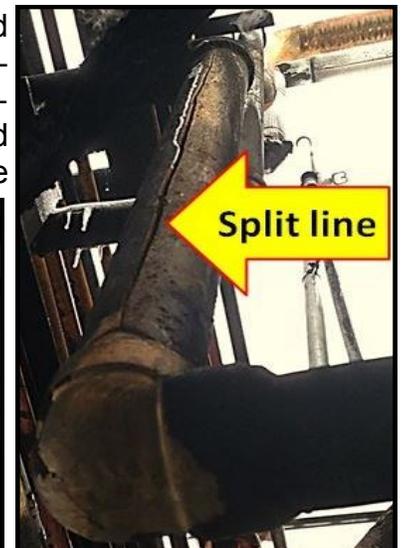


HAZARD ALERT

Two Workers Suffer Life Altering Burns in an Explosion After a Dead-Legged Pipe Ruptures. The Destruction Causes the Plant to Close, and About 100 Lose their Jobs

Two workers in a control room noticed what appeared to be a steam leak or a non-normal white-colored vapor cloud traveling less than six-feet off the ground. According to the control room operator, the operations at this time appeared to be running normal. The two workers then left the control room to investigate what was causing the vapor cloud. As they neared the area, a violent explosion and fire occurred. This resulted in substantial damage to the facility and the two workers being seriously burned and admitted into a burn ward. The incident triggered a major emergency response of up to 40 fire departments, community evacuations and environmental issues. Not long after the incident, management decided to permanently shut down operations causing about 100 workers to be unemployed.

A three-foot long vertical pipe that was dead-legged split open due to freezing conditions outside and released propane gas which subsequently found an ignition source and ignited. The dead-legged pipe had been out of service for almost 17-years. The pipe remained in place without heat tracing, insulation, or a means to drain water. This freezing and thawing action lead to the piping integrity issues and it's ultimate failure.



Recommendations to Prevent Recurrence:

- Develop and implement a written Freeze Protection Program with the following elements; Removal of all dead-legs (emphasis added), if removal is impractical, positively isolate dead-legs by installing slip blinds, freeze-protecting them, or procedures to regularly monitor and drain water from low points.
- Piping and instrumentation drawings (P&ID) must be updated to identify dead-legs.
- A Process Hazard Analysis (PHA) must examine freezing hazards as a threat to piping integrity.
- Periodically review and conduct surveys for dead-legs or other idle/infrequently used piping systems and potentially freeze-prone dead-legs. Pay close attention to areas where water may collect and maintain drainage.
- When conducting a piping Management of Change (MOC) be sure to consider and review the potential for creating dead-legs.
- Inspect and maintain existing freeze protection measures; insulation and heat tracing with steam-filled tubing or electric heat tape (where applicable).
- Provide effective education and training to workers on the above.
- Provide and maintain sufficient staffing levels to address these types of hazards.



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The information provided in this alert is based on preliminary data only and does not represent final determinations pertaining to the nature of the incident or conclusions regarding the cause of this event.