

Williams Olefins Plant Explosion and Fire

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<https://www.csb.gov/williams-olefins-plant-explosion-and-fire/>

On June 13, 2013, there was an explosion and fire at the Williams Olefins Plant in Geismar, LA. This explosion killed two employees. Deficiencies in the plant's process safety management at the Williams Geismar facility during the 12 years leading to the incident allowed a heat exchanger to be unprotected from overpressure, and ultimately rupture, causing the explosion. This facility produces ethylene and propylene for the petrochemical industry and has around 110 employees. At the time of the incident, approximately 800 contractors worked at the plant on an expansion project aimed at increasing the production of ethylene. The incident happened during non-routine operational activities that introduced heat to the reboiler, which was offline and isolated from its pressure relief device. The heat increased the temperature of a liquid propane mixture confined within the reboiler, resulting in an extreme pressure rise within the vessel. The reboiler shell catastrophically ruptured, causing a boiling liquid expanding vapor explosion (BLEVE) and fire, which killed two workers. Another 167 workers, the majority were contractors – reported injuries due to the BLEVE. There was very weak process safety culture at the Williams Geismar facility, resulting in a number of process safety management program insufficiencies. These include deficiencies in implementing Management of Change (MOC), Pre-Startup Safety Review (PSSR), Process Hazard Analysis (PHA) programs and procedure programs causal to the incident. The plant failed to properly manage or effectively review two significant changes that introduced new hazards involving the reboiler that ruptured: the installation of block valves that could isolate the reboiler from its protective pressure relief device and the administrative controls Williams relied on to control the position (open or closed) of these block valves. There was also failure to effectively complete a key hazard analysis recommendation intended to protect the reboiler that ultimately ruptured. Williams Olefins also failed to perform a hazard analysis and create a procedure for the operations activities conducted on the day of the incident that could have addressed overpressure protection.

All incidents are preventable and this tragic accident at Williams is a prime example of something that could have never happened. Key take aways from this incident is the importance of using the hierarchy of control to perform a proper evaluation and chose the correct safeguards to control any danger of the process. It is so imperative that companies have a strong safety culture, to encourage safety comes first and is a priority. There also should be process safety mangment programs in place, which would be used to prevent incidents from happening.

