HIAD: Event details

Report created on: 22/8/2019

ID	382
Event	Release from core, piping, fittings, etc.
Event classification	Hydrogen system initiating event
Physical consequences	Jet Fires and Explosions
Application stage	Hydrogen transport and distribution
Full description	Near the end of the process of filling a gaseous hydrogen tube trailer at a liquid hydrogen transfilling station, a safety pressure-relief device (PRD) rupture disc on one of the tube trailer¿s ten tubes burst and vented hydrogen gas. The PRD vent tube directed gas to the top of the trailer where the hydrogen vented and ignited, blowing a flame straight up in the air. The operator filling the tube trailer heard a loud explosion from the sudden release of hydrogen gas and saw flames immediately. The operator closed the main fill valve on the tube trailer, stopping the hydrogen fill; however, the ten cylinders on the tube trailer were almost full (2500 psig/173 bar). The tube trailer involved in this incident was one of two tube trailers being filled simultaneously and was second in a line up of five tube trailers parked adjacent to one another at this location.
Region	America
Country	UNITED STATES
Date	02-JAN-09
Cause	Design failure/error
Cause comments	Equipment failure. The hydrogen tube trailer involved in this incident was doing its first fill after requalification, where all the PRDs had just been replaced. The PRD rupture disc designed for 3500 psig (241 bar) failed at about 1000 psig (69 bar) below rated pressure. The hydrogen tube trailer was

	grounded per procedure during the filling operation. Subsequent follow-up examination of the PDR rupture disc lot by the PDR manufacturer found that all of the lot conformed to specification.

Description of the Facility

Application Stage	Hydrogen transport and distribution
Application Chain	Tube trailer
Storage medium	Gas
Location type	OPEN
Location description	Industrial plant
pre-event summary	Near the end of the process of filling a gaseous hydrogen tube trailer at a liquid hydrogen transfilling station, a safety pressure-relief device (PRD) rupture disc on one of the tube trailer`s ten tubes burst and vented hydrogen gas. The PRD vent tube directed gas to the top of the trailer where the hydrogen vented and ignited, blowing a flame straight up in the air. The operator filling the tube trailer heard a loud explosion from the sudden release of hydrogen gas and saw flames immediately. The operator closed the main fill valve on the tube trailer, stopping the hydrogen fill; however, the ten cylinders on the tube trailer were almost full (2500 psig/173 bar). The tube trailer involved in this incident was one of two tube trailers being filled simultaneously and was second in a line up of five tube trailers parked adjacent to one another at this location.

Consequences

Total number of injured persons	1
Post-event summary	Emergency responders were dispatched to the scene. The facility deluge system was turned on. This system covers the trailer fill aisle with water and includes nozzles at the rear of the trailer and a fire cannon directed to the front. When the emergency responders arrived, they immediately began spraying the adjacent trailers to ensure that they stayed cool. The HazMat crews closed the 10 individual tube fill isolation valves located at the rear of the tube trailer and extinguished the fire. Total time to control the incident was less than 10 minutes and there was no property damage from this event.

Event Nature

Emergency action	Emergency responders were dispatched to the scene. The facility deluge system was turned on. This system covers the trailer fill aisle with water and includes nozzles at the rear of the trailer and a fire cannon directed to the front. When the emergency responders arrived, they immediately began spraying the adjacent trailers to ensure that they stayed cool. The HazMat crews closed the 10 individual tube fill isolation valves located at the rear of the tube trailer and extinguished the fire. Total time to control the incident was less than 10 minutes and there was no property damage from this event.
Release type	Gas
Release substance	Hydrogen