

LIGHTNING Strikes ENBRIDGE Crude Tank

ThunderStorm® Strikes Back!

Intermittent thunderstorms on the morning of September 16, 2004 led to a lightning strike to a 116 foot floating roof crude tank. Captain Mike Meisenheimer, the first officer onsite at 6:47 a.m., verified the strike and a resulting 75% involved seal fire to the roof of the crude oil tank. Fire Chief Dennis Fisher was notified at 6:55 a.m. of the situation — which resulted in a seal fire.



Lightning strike sets off seal fire on this 116 ft floating roof crude tank

All Enbridge site personnel are trained in fire extinguisher use and fire emergency recognition and response. Company supervisors were quick to execute emergency response procedures to establish an Incident Command System (ICS), thereby managing the initial response. Cushing Fire Department and Cushing Police Department personnel were the first outside agencies to arrive on the scene and they set about securing the area and establishing a joint ICS.

Immediate concerns and efforts by facility personnel were to isolate the area of the fire, and to determine requirements for a proper response to the emergency site. Secondary consideration was given to minimizing business interruption.

The Cushing Fire Department's initial response was a 1,250 gpm E-ONE pumper, and a 4,200 gallon tanker. After initially sizing up the scene, Fire Department command activated a mutual aid response to

the Drumright and Chandler municipal fire departments. Using the Safety Alliance of Cushing (SAC) emergency call circle, an emergency alert was issued to all neighboring oil companies.

The Safety Alliance of Cushing has a list of mutual aid responders and available equipment, and the call went out through the SAC to Tulsa Sunoco Refinery for foam support. This call resulted in prompt response by the Cushing Municipal Fire Department with its pre-planned oil industry response equipment. Aid and assistance was also provided in the form of a foam pumper and tanker supported by mutual aid from area fire departments.

Employees onsite started lock-out/tagout procedures to isolate power to associated equipment and possible secondary ignition sources, while an employee was assigned to open the closest facility gate and direct arriving emergency responders as they arrived.

Due to the rarity of such events - and the thirst amongst Industrial Fire Responders for hands-on experience, the turnout of responders from neighboring areas was overwhelming. Representatives from several other local fire departments including the Stroud, Glencoe, and Stillwater Fire departments were on scene to assist the Cushing Fire Department.

As mutual aid responders arrived, full response operations were underway by 9:15 a.m. Rapid response and containment procedures isolated the event to the initial tank strike. No other structures were threatened and normal operating processes continued throughout the rest of the facility.



Dwight Williams meets with Enbridge officials to review response operations

Initial extinguishment efforts included folding water tanks and a water shuttle system to supply the use of hand lines for foam application.



Mutual aid react teams move in to cool tank shell to prevent reignition during Dasplit flow to seal area

Initial operations were suspended approximately 80% into extinguishment when equipment failure forced the response team to pull out of the tank roof area and reassess the situation. At this point, a joint decision was made to call in Williams Fire & Hazard Control for assistance. Chief Dennis Fisher called Dwight Williams at 10:30 a.m. to review the situation ...

agreed to send 14 totes of foam in support. The foam and the Williams team arrived in Cushing at about 4:00 p.m. on the day of the strike.

While waiting for the foam, local firefighters established a water supply system utilizing a pond on the facility. Two (2) 1,250 gpm and two (2) 1,000 gpm pumpers were used to pump the water for a full-surface application.

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This event proved the value of establishing early ICS. With a large number of responders and the scope of equipment and resources required for such an emergency it was - and is - imperative to have clear chain of command to best coordinate and protect those involved in the response. The Safety Alliance of Cushing (SAC) was used in com-



A rim-mount Dasplit™ Tool is deployed for safe and effective reach to quickly extinguish seal fire



During a meeting between Dwight Williams, Chief Fisher, and Enbridge representatives, Dwight proposed a unique approach for this particular situation.

“I’ve always wanted to pump crude oil back into a burning tank, but until now the right situation never presented itself.” Enbridge management decided to move forward with this tactic. Oil was pumped back into the tank at a calculated rate to refloat the lid and eliminate the vapor space. As the lid was raised, any internal fire was extinguished and the remaining seal fire could then be safely attacked using two (2) foam wands, and two (2) rim-mounted Dasplit tools.

Extinguishment was achieved with ThunderStorm® ATC 1x3 at 1%. The fire was declared as extin-

guished and loss stopped at 21:10 p.m. by the Cushing Fire Chief.

It was determined the right foam, water, and specialized equipment designed to address such scenarios are vital resources when addressing fires of this type. Also, it is imperative that joint response training be held where mutual aid is required to respond to these concerns. A recent field exercise by the FBI helped members of the emergency response teams and other companies come together in a more efficient manner. Joint training and exercises always benefit responders and improve the situation in the time of an emergency through pre-planning. SAC plans to continue working with mutual aid departments on unified command and additional training toward ICS and communication preparedness to ensure future readiness.

Site analysis following the initial attack determined there was only about 4 feet of product in the 60 foot tall tank. The floating roof was now standing on its legs at approximately 5 feet, creating a vapor space between the roof and the surface of contained product. The decision was made to treat the situation as a full surface involvement.

Following a discussion with the Enbridge officials, Dwight Williams and his crew agreed to deploy to the site in Cushing as Joe Bennet, Fire Chief with Tulsa Sunoco Refinery,

