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Fire school completes construction project



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Time tested tactics conquer raging pipeline fire in Mexico

5-Minute Power Shot

By **ANTON RIECHER**
IFW Editor



Photos provided by Felipe Hanhausen

Top, at left, the IBOT minivan that delivered essential equipment to the pipeline fire. Top, at right, burning fuel ejected from the ruptured pipeline feeds a pool fire that contains what is left of a truck used by the failed thieves. At right, firefighters use 1 -inch and 2 -inch hoselines to apply a foam blanket to the fire. Immediately above, a Ferrara pumper is fed water from a tanker equipped with a mid-ship pump. Three more tankers are nearby.

Industrial firefighter Felipe Hanhausen was down to his last few pounds of PKW dry chemical when the fire that issued for nearly 37 hours from a ruptured 20-inch gasoline pipeline in Quecholac, Mexico, finally died away.

"We were very, very fortunate," Hanhausen said. "When I arrived there was only one 350-pound wheel unit left at the scene filled with PKW."

Using that wheel unit and four gallons of Solberg 3x6 ATC foam concentrate distributed using a ACAF BOSS-60 compressed air foam system unit, Hanhausen brought the pipeline fire to an end – almost.

"I say 'almost' because flames were still showing when the wheel unit ran out," he said. "You'll laugh but I remembered that I had a five-pound extinguisher filled with PKW in my mini-van. The very last of the fire was put out using that little extinguisher."

When the fire started on March 15, Hanhausen estimates the release pressure at 300 pounds per square inch. That dropped after upstream valves were closed, but remained substantial due to hydrostatic pressure and the amount of product left in the pipeline.

It took Hanhausen three hours to prepare for the foam/dry chemical attack that ultimately proved successful. Actual execution was accomplished in slightly more than 15 minutes.

"This was not a one-man show," Hanhausen said. "It was a team effort in which all the firefighters on scene performed a task. The time dedicated to implementing incident command and organizing continuous supply of water is key to the successful extinguishment of the blaze."

QUECHOLAC

Hanhausen and his wife/business partner Berta operate two businesses in Mexico City. H&V is an Federal Aviation Administration and U.S. Department of Transportation approved aeronautical repair station. The Hanhausens' second business, IBOT, is a sales and consulting firm concentrating on industrial firefighting.

Hanhausen's impeccable credentials as an industrial firefighter include a 15-year affiliation with Dwight Williams, former head of Williams Fire & Hazard Control. During those years, Hanhausen provided specialized technical assistance to major oil companies working in Latin America and the Caribbean.

The owners of the pipeline in Quecholac are IBOT clients. The fire broke out at 4 a.m. and had all the telltale signs of thieves attempting to steal bulk quantities of gasoline, a common crime in Mexico.

"They usually mount a valve on the pipeline using a bracket," Hanhausen said. "With the valve open, they drill a hole through the pipeline, then use the valve to control the flow."

Apparently, the pressurized product overwhelmed the makeshift valve. The thieves found themselves standing in a spreading pool of gasoline. Then there was an ignition.

"We don't know if they got away or not," Hanhausen said. "The fire was so intense and lasted so long that what remained of the truck they were driving was almost disintegrated by the flames."

Located in a farm field about 120 miles southeast of Mexico City, the intense fire soon drew immediate concern. The pipeline owners and the federal and state governments all converged on

the spot with security personnel, service/maintenance crews, firefighters and apparatus.

In the hours that followed, agencies on site focused their efforts on implementing their emergency response plans. The service/maintenance and fire response crews concentrated on closing the valves upstream to reduce pressure in preparation for extinguishment.

The hours passed and several attempts to extinguish the fire were made. However, 24 hours later it continued to burn violently.

"Obviously, this fire had different characteristics than those other frequent fire emergencies caused by pipeline theft," Hanhausen said.

Finally, Hanhausen--- got a call from the pipeline owners at 5 a.m. the next day. It took him three hours and 20 minutes to reach the scene.

UNDERSTANDING THE FIRE

"My first concern after receiving the call was to make myself the most accurate picture possible of what was going on at the fire scene," Hanhausen said.

By the time a customer calls IBOT to ask for assistance they have already exhausted all their own ideas on how to extinguish a fire, he said.

"These calls usually come from people we know from our professional activities in the fire protection industry," Hanhausen said. "They want advice and assistance providing support equipment and, foam. They may even ask for our presence on the site to help manage the emergency and successfully extinguish the fire."

His initial conversation with the pipeline owners triggered several concerns, Hanhausen said.

"From the first reports I learned that what was burning was 87 octane gasoline and that the pipeline was a 24-inches in diameter (later this was confirmed to be 20"), that the spill formed a pool of fuel the size of almost half a football field in the middle of harvested land and that beside the fire apparatus on site backhoes and frontal loaders had arrived."

This information led to Hanhausen's first recommendations.

"The size of the spill and tridimensional fires due to the pressure leak and the effect of any obstacles present inside the spill were one of my major concerns," Hanhausen said. "One of my first recommendations was to confine the spill by using the heavy machinery available to build levees around it, reducing its surface to almost one-third."

STEADY WATER

Another concern was water supply. The first information received suggested that the only water available was only from a few mid size tankers available at the site.

"Without enough and constant water supply extinguishment could turn extremely difficult, not to mention the handling of the tridimensional fires that could be expected," Hanhausen said.

Arriving on site, his concern about the lack of water was confirmed.

"We had foam," Hanhausen said. "We had pumping capacity. The only thing missing was water."



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Where do the farmers get their water? he asked. The farmers had their own pump with four-inch irrigation line. Hanhausen also discovered an abandoned 5,000 gallon concrete pool formerly used to water cattle. That would come in handy because the fire equipment on scene required different types of connections.

Hanhausen's solution to the water supply problem was to establish a carousel of water tankers transferring the water to a tanker directly servicing the pumper assigned to the fire.

"With good pumping capacity to fill the pool quickly we were able to fill the tankers from the pool," Hanhausen said. "The tankers would then move into position next to the pumper-tanker and discharge using the pumper inlet."

Three water tankers were available at the scene and three more were scheduled to arrive. Meanwhile the water reservoir was prepared and the strategy to put out the fire designed.

"At the site of the fire I had a 1,500 GPM foam pumper (with his foam tank full of AFFF3x6 foam) and a pumper-tanker with 2,600 gallons of water," Hanhausen said. Three of the water tankers were assigned to supply water to the pumper tanker so this apparatus could provide continuous water to the pumper and maintain a steady main attack for at least 15 minutes using a 500 gpm portable monitor and two 95 gpm handlines."

The water from the cement reservoir provided a backup system, with another tanker used to move it to the pumper tanker. Also, Hanhausen had two smaller foam pumpers that would provide support in applying a foam blanket from the far side of the fuel spill using 95 gpm handlines.

With the tankers working in unison, Hanhausen was able to guarantee a steady supply of water to the fire. Meanwhile, the pipeline owners had been using heavy equipment to reduce the size of the spill to an area of about 400 meters square.

"We shaped it into a rectangle with the pipeline flowing into it," Hanhausen said. Trenches were also dug in case the diked area overflowed.

Next, Hanhausen turned to the fire. The flow and pressure of the spill was creating a tridimensional pressure fire that flowed downhill into the pool of fuel. The heat on that fuel and the surroundings was so intense

that the rising gasoline vapors were capable of going right through the foam blanket, creating still another tridimensional fire scenario.

The wreckage of the truck used by the thieves was another problem. It created obstacles of overheated metal, offering hidden places to reignite the fuel while degrading the foam where it made contact with the metal.

"We were faced with two different scenarios of pressure fires to handle once the knock down was obtained," Hanhausen said.

In his minivan, Hanhausen brought 10 buckets of Solberg's RF 3x6 ATC foam and an ACAF BOSS-60 compressed air foam system. The ACAF BOSS-60 comes with an internal state-of-the-art mixing chamber that produces a thick, dry foam blanket. After knockdown of the pool fire, the foam helped deal with persistent tri-dimensional fires that reignited the gasoline flowing from the leaking pipeline.

"Solberg's RF 3x6 ATC is 100 percent fluorine free foam that among its properties creates a very consistent and lasting finished foam blanket," he said. "As it was applied using compressed nitrogen the CAF system generated a very thick and dry foam cover that helped me optimize the limited amount of PKW available when fighting the tri-dimensional fire."

Concentrating the water from the tanker truck carousel on the fire, Hanhausen moved in with the CAFS unit and the last 350 pound dry chemical wheel unit available on site.

"I brought my minivan with the CAFS unit up to the fire," he said. "I assigned two firefighters to lay about 30 meters of hose."

The nitrogen expanded foam blanket helped to hold down the vapor from the fuel. Hanhausen then used the dry chemical to extinguish the three-dimensional pressure fire to deal with."

Unfortunately, the dry chemical wheel unit played out before all the pressure fire had been dealt with. Hanhausen remembered the five-pound PKW extinguisher in his minivan.

"I called to my guy driving the minivan and said 'Bring me the little extinguisher,'" Hanhausen said. "He couldn't believe me. 'The one in the truck?' 'Yes,' I said. So he handed it to me and then started walking off to the side of the fire."

That small extinguisher gave Hanhausen enough advantage to get the job done.

"If the fire has resisted a few minutes

more, we wouldn't have been successful," Hanhausen said.

With the last of the pressure fires extinguished, Hanhausen continued to apply foam with the CAFS unit.

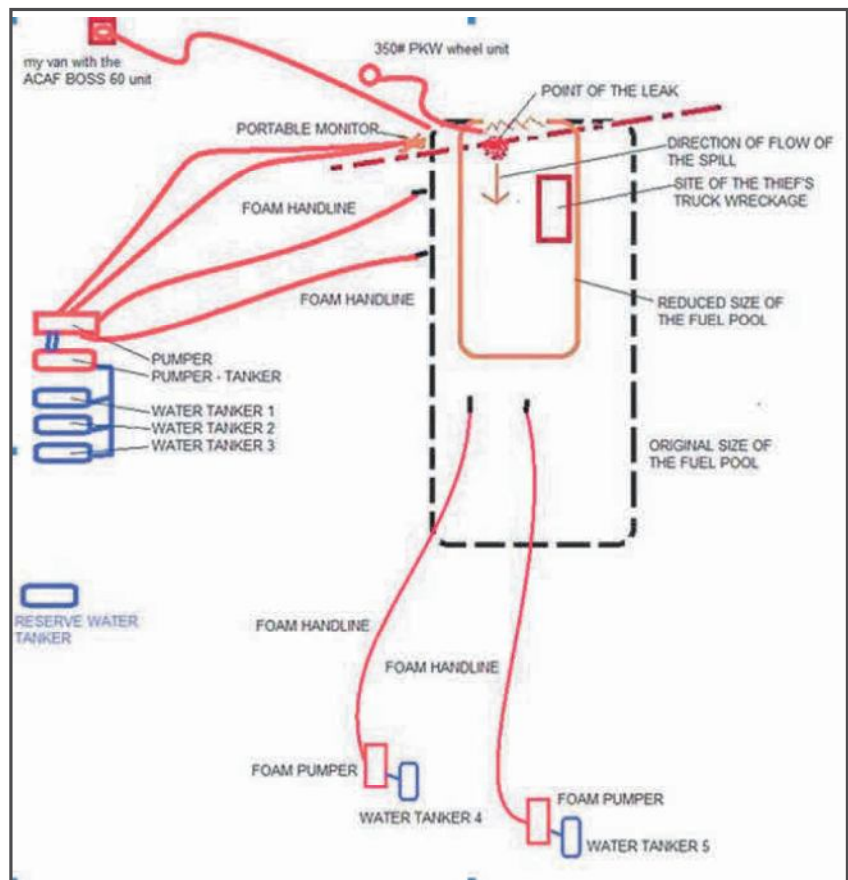
"You can put a very good quality foam blanket on top of that fuel that will last a long time because it has a very slow draining time," he said. "It gives you a safe environment to work in and prevent further fires."

The pipeline owners were impressed, too, Hanhausen said.

"After seeing how this unit performed, it is clear that this type of self contained equipment can provide great backup to service/maintenance crews for preventing ignition of spills by quickly applying a thick and long lasting foam blanket over the spilled fuel," he said

Working with firefighters the caliber of Dwight Williams and Jerry Craft taught Hanhausen to set priorities, he said. Training at a fire school the caliber of Texas A&M University taught him the importance of incident command.

"You need to know how to organize yourself to handle an emergency," he said. "You need to prioritize your resources and focus on the root issues of fire fighting."



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