

In War Zone, Boots & Coots Fights Infamous Kuwaiti Oilfield Fires of 1991 with Abrasive Jet Cutting System

INNOVATIVE TECHNOLOGY HELPS BOOTS & COOTS EXTINGUISH OIL FIRES IN ONE OF THE WORST OILFIELD DISASTERS IN HISTORY

KUWAIT

CHALLENGES

- » Logistical and technical difficulties with extinguishing 700+ oil fires
- » Lack of water to fight the fires
- » Extreme desert heat compounded by burning wells
- » Explosive land mines buried in the sand by the retreating military

SOLUTIONS

- » Implemented newly developed abrasive jet cutter technology to cut the wellheads quickly
- » Used the oil pipeline system to convey seawater from the Persian Gulf to the well fires
- » Cleared land mines to ensure safe access to the wells

RESULTS

- » Abrasive jet cutter technology reduced time to ready wellheads for re-heading from 30 hours to 30 minutes
- » 700+ oilwell fires extinguished in only eight months – far less than the five years some experts expected
- » Boots & Coots continues to use the well control practices honed in Kuwait in 1991

OVERVIEW

During the Iraqi military withdrawal from Kuwait in 1990, the retreating army set fire to hundreds of Kuwaiti oil wells, about 60 percent of the country's wells. Boots & Coots was one of four major well control companies called in to extinguish the wells, and it was able to successfully cap dozens of the burning wells by using an abrasive jet cutting system newly developed by Halliburton.

CHALLENGES

The retreating Iraqi military's demolition of more than 700 oil wells in early 1991 created the world's most notorious oilfield catastrophe. Each day that the fires burned brought losses exceeding USD 125 million in oil, and speculation about the environmental impact ranged from heavy acid rains to something akin to a bleak nuclear winter.


In addition to the unprecedented magnitude of the disaster, other challenges included the lack of water to fight the fires, scattered lakes of unburned oil, land mines placed by the retreating army, and the extreme desert heat – made worse by the heat from the pervasive fires. Some experts said it would take five years to extinguish all the well fires.

SOLUTIONS

To convey the large volumes of water needed to fight the fires, seawater was pumped from the Persian Gulf through the oil pipeline system to water pits built for each fire and measuring some 100 feet (30 meters) long, 50 feet wide (15 meters), and 10 feet (3 meters) deep.

In response to this challenge, Halliburton developed its abrasive jet cutting system. Designed to be easily positioned on a burning well and controlled remotely, it uses a sand and water mixture to make a clean, level cut across the wellhead, allowing the burning hydrocarbon flow to exit vertically and making it possible to extinguish the fire with water. The innovative technology rendered obsolete the use of explosives for wellhead removal and

CONTAINED OVER
700
WELLS
IN 8 MONTHS



HALL60446



Figure 1. Some experts said it would take five years to extinguish Kuwait's burning oil wells in 1991; instead, Boots & Coots extinguished these fires in only eight months. (Photo courtesy of R. Hatteberg)



Two billion barrels of oil were lost in the fires, yet not a single Boots & Coots well control specialist was injured – a testament to the premium put on safety.

introduced a far greater element of safety for the well control specialists. With the development of this technology, Boots & Coots has entirely ceased using explosives to remove wellhead equipment in well control operations.

RESULTS

The initial rate at which fires were extinguished was approximately one well every 7–10 days, increasing to two wells a day as land mines were removed and the abrasive jet cutter technology was implemented with increasing frequency.

The first well fire was extinguished in April 1991, and the final well was capped the following November, with more than 700 wells contained in only eight months – far less than the five years some experts expected. Two billion barrels of oil were lost in the fires, yet not a single Boots & Coots well control specialist was injured – a testament to the premium put on safety.

The Halliburton abrasive jet cutter technology was credited as the single most significant tool in shortening the time needed to control the Kuwaiti well fires. The jet cutter reduced the time to make a wellhead ready for re-heading from 30 hours to 30 minutes! Today, Boots & Coots maintains the largest fleet of these jet cutters in the world.

The Halliburton abrasive jet cutter technology was credited as the single most significant tool in shortening the time needed to control the Kuwait oilwell fires. The innovative tool is remotely controlled, putting a greater distance between the fire and the well control specialist. It is designed to be easily positioned on a burning well, and uses a sand and water mixture to make a clean, level cut to the wellhead, which directs the burning hydrocarbon flow to exit vertically and makes it possible to extinguish the fire with water. It also renders obsolete the use of explosives for wellhead removal.



Figure 2. Boots & Coots well control experts spray water to cool a wellhead and potentially extinguish the fire. (Photo courtesy of R. Hatteberg)



Figure 3. Well control experts with Boots & Coots work at close proximity to a wellhead, attempting to remove a flange. (Photo courtesy of R. Hatteberg)



Figure 4. The Halliburton abrasive jet cutter can reduce readying a new wellhead from 30 hours to 30 minutes, and this innovative tool contributed in large measure to the success of the Boots & Coots operation in Kuwait. (Photo courtesy of R. Hatteberg)

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