

# Application Engineering Bulletin

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## A Challenge Like No Other: Pumping Under the WTC Devastation

September 11 dawned like most mornings at Thompson Pump headquarters in Port Orange, Florida, only to end up like no other. Once the first news reports regarding the World Trade Center were broadcast, the people at Thompson knew their Emergency Response Team (ERT) would be activated. The ERT is a group of experienced and dedicated Thompson employees who assemble to assist dealers and end users with applications consulting and pump sourcing when an emergency develops.

"We knew pumps would be needed, although we were not exactly sure where, when or what type," said Majid Tavakoli, vice president of applied products for Thompson Pump. "We alerted our support centers and dealers in the northeast that any available pumps may be called into action." They also started contacting emergency and government personnel to find out what type of pump applications would be needed.

Two days later, when Thompson received a request for assistance, the ERT had already compiled a list of available pumps that could be mobilized for Ground Zero. Pumping Services, of Middlesex, New Jersey, had been alerted that there was a very extreme pumping problem at the site.

"John Corkery, pumping specialist for Pumping Services, brought us a pumping challenge that was much more critical than we had ever seen, a major flooding emergency from underneath the central disaster site," explained Tavakoli. "Water began filling the rain tunnels underneath the twin towers immediately after the collapse. Broken water and sewer mains, fire fighting water, groundwater infiltration . . . these all increased the amount of water flowing into the tunnels."



The two 12-inch pumps had to be brought into the tunnel on rail cars.

An even bigger concern was the water filling the one mile long train tunnels under the Hudson River connecting the World Trade Center station to New Jersey. It was imperative that the tunnel be cleared of millions of gallons of water immediately to prevent collapse. Robert Hennessy, northeast regional manager for Thompson Pump and Tavakoli departed immediately for New York.

"It all happened so fast, we never really had a chance to take in the significance of it all," said Hennessy. "But after we toured the site and had a firsthand look at the devastation, it was overwhelming. We knew that it was imperative that we do the job quickly. There was so much at stake."

The team quickly learned that water levels were rising inside the subway tunnel at an alarming rate. As a result, the slurry wall, a 3 ft. wide by 70 ft. tall waterproof wall around the WTC infrastructure, was at risk of collapsing and could result in flooding of the subway tunnel. From there, the water would, in turn, eventually flood into New Jersey, causing major collateral damage.

Corkery, Hennessy and Tavakoli made some calculations based on the pumping requirements: 4,000 gallons per minute (GPM), or 240,000 gallons per hour (GPH), at 270 feet of head, pumping water through 12-inch suction lines running 1,500 feet long, and discharging water through 12-inch pipe running from the pump end, up the 120 step tunnel escalator, which is a 70 foot vertical rise, to the discharge point. The group then submitted their design for the suction and discharge systems. Meanwhile, others were looking for the additional equipment necessary for other related construction activities.



The team comprised of representatives from Thompson Pump, the Port Authority and the contractor sets up the discharge pipe system.

They determined that the best pump to meet these challenging requirements was the Thompson 12JSC, a 12-inch high pressure jet pump capable of handling 5,200 GPM (312,000 GPH), 350 feet of dynamic head and 1,400 foot suction lift. In addition, the 12JSC, powered by diesel 300 horsepower engines, features the Thompson Enviroprime™ dry priming compressor-assisted system, which is totally self-contained and does not release any blow-by back into the environment.

Two 12JSC pumps were sourced from the nearest available Thompson Pump inventory through the ERT and transported to the New Jersey side of the tunnel. They were then taken into the subway system via rail cars provided by the Port Authority Trans-Hudson Corporation (PATH) operations. In addition, extra capacity fuel tanks were installed on the rail cars. A flotation system was designed to place pipe in the tunnel by

plugging the ends of the pipes. A team of divers swam about 1,500 ft. into the tunnel to remove the pipe plugs. The Thompson team spent the next two days getting the pumps prepped for operation and connecting the rest of the suction and discharge systems. The poor air quality in the tunnel made the process even more difficult.

"It all served to remind us of the devastation across the river. Working so closely to this human tragedy was difficult," recalled Tavakoli.

After 72 hours of continuous work on site, as well as finding and trucking material and the assembly of this vast pump and pipe system, the Thompson team was ready to start up the pumps.

While they had complete confidence in the 12JSC and knew the pumping system was connected correctly, they still breathed a collective sigh of relief when the pumps started right up and all connections held. Over the next 24 hours, the danger began to pass and recovery workers could begin turning their attention elsewhere. Concrete bulkheads were poured in the PATH tunnels, as well as others, as the water receded.

From the moment the 12JSCs first started operating, they ran without any problems and the system cleared millions of gallons of water from the tunnel.

The team at Thompson was honored to have assisted in this national disaster and acknowledges the combined efforts of John Corkery of Pumping Services, The Federal Emergency Management Association and the Port Authority of New York/New Jersey.



Pumps and piping are set up to begin the dewatering process.

Since 1970, Thompson Pump & Manufacturing has specialized in assisting contractors worldwide with high quality pumps, dewatering equipment and engineering expertise. Based in Port Orange, Florida, Thompson Pump operates support and service centers in Virginia, Mississippi, North Carolina, South Carolina and Florida. Company founder George Thompson introduced the rotary wellpoint pump which revolutionized wellpoint dewatering methods and also developed the Filtervac pipe. Thompson pumps are certified by the Contractors Pump Bureau.