

That Extra Boost

Clifford Seth



In-line VFDs are some of the keys to this successful upgrade that improved pressure and flow reliability in the pre-fab booster station.

The engineer for this water system upgrade says a key feature of the pre-fab, skid-mounted, custom booster station is its pre-assembled, pre-programmed, calibrated and tested automatic controls, including the pump panel (right), which houses the VFDs, and SCADA telemetry panel (left).

Water system management for the city of Brownsburg, Indiana, reports a successful upgrade for pressure and flow reliability through installation of a customized, pre-fab booster station that was deployed simultaneously with increased water storage capacity.

The Brownsburg system serves about 7,600 metered customers, 85 percent residential and the rest business, commercial and industrial. Peak daily consumption is 2.8-mgd, with the average at 1.6-mgd. The town's two water plants provide a total of 1,725-gpm, and an additional 575-gpm is purchased.

The upgrade was needed to meet increasing demand for residential, commercial and industrial use that is continuing to develop, primarily at higher elevation.

The resulting reliability gain includes use for fire protection, with consequent improved rating expected to offer users further benefit by helping to control their insurance costs.

The customized pre-fab booster station, including factory-assembled and tested controls, was manufactured by Flowtronex PSI Inc. (Dallas, TX), an ITT Industries company, at its Dallas plant, and installed within a new storage tank that had been built concurrently at the site. Engineering services for the upgrade project were provided by Robert E. Curry & Associates (Danville, IN).

"We've been in full operation since November and

have had great flow and pressure without any downtime," says Kevin Lee Servies, Brownsburg's water superintendent. He explains that technicians came out three times to help him investigate pressure spikes, and found the cause in each case to be just spikes in the power supply.

"We are now confident in our ability to reliably meet increasing demand from new residential and industrial development to the north," explains Servies, "and also expect to gain an improved rating from the state Insurance Service Organization, which should offer our customers further benefit by helping to control their insurance costs."

Previously, the system relied only on a 120-ft hydropillar storage tank to provide 56-psi at peak demand. But by 2003, with demand growing in higher elevations of the northern area, typical pressure had lowered, ranging from 38-psi to 42-psi.

Then, with the advent of new two-story homes, some having as many as five baths, upstairs pressure was as low as 32-psi to 34-psi. Meanwhile, an industrial park that had started in 2001 required fire flow capability of 1,800-gpm to 2,200-gpm @ 20-psi minimum, and it was not yet half built out.

"We began to be concerned about approaching the 20-psi minimum mandated by the Indiana Department of Environmental Management," recalls Servies. "We increased our main sizes from 6-in, 8-in and 10-in to 12-in, 16-in and 20-in. Now we needed to isolate 8 main feed



To provide reliable 24/7 storage for residential service at both higher and lower elevations, as well as industrial fire suppression up to 2,400-gpm @ 72-psi for three hours, the engineer specified a 3-pump booster station to be installed within base of new, additional storage tank. The pumps connect to a discharge manifold.

valves to allow for steady 56-psi for the southern part of the service area, and also decided we needed a boost to 72-psi for the northern demand to create capability for the fire flows



A custom "bell" adapter provides connection from the booster station to the system's discharge line. The system serves about 7,600 metered customers, 85 percent being residential and the rest business, commercial, and industrial. Peak daily consumption is 2.8-mgd, with the average at 1.6-mgd.

potentially needed there. We needed enough capacity for the largest building in the park and still provide for residential needs if we had to deploy it. Increasing our purchased flow

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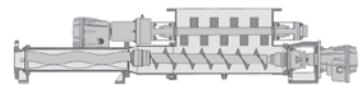
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wasn't going to help enough."

In response to the challenge of providing 24/7 storage needs for residential service, as well as fire suppression up to 2,400-gpm @ 72-psi for three hours, Curry & Associates specified a 3-pump booster station, including in-line variable frequency drives (VFDs), to be installed within the base of a new storage tank in the north end of the service

area that matched the height of the existing tank in the south.

Bob Curry, the engineering firm's president, said one key feature of the booster station was its pre-assembled, pre-programmed, calibrated and tested automatic controls.

"The composite tank – steel on top of concrete to minimize painting maintenance – gave us a large diameter cylinder that was empty except for piping, providing an ideal place to install the booster station and take suction from the new tank," notes Curry. "Having the pump station is like having a second tank for the north end. And with the station's controls already assembled, all we had to do was drop it into place and connect the piping and wiring."

The VFDs give the system's management the capability to adjust and maintain constant pressure, including at the higher elevation locations, as flow rates change.

With the pump station being custom pre-built in Texas, Curry was able to concurrently fabricate the booster station and the elevated water tank. This prevented having two different contractors working on the site at the same time, which would have been an invitation to damage.

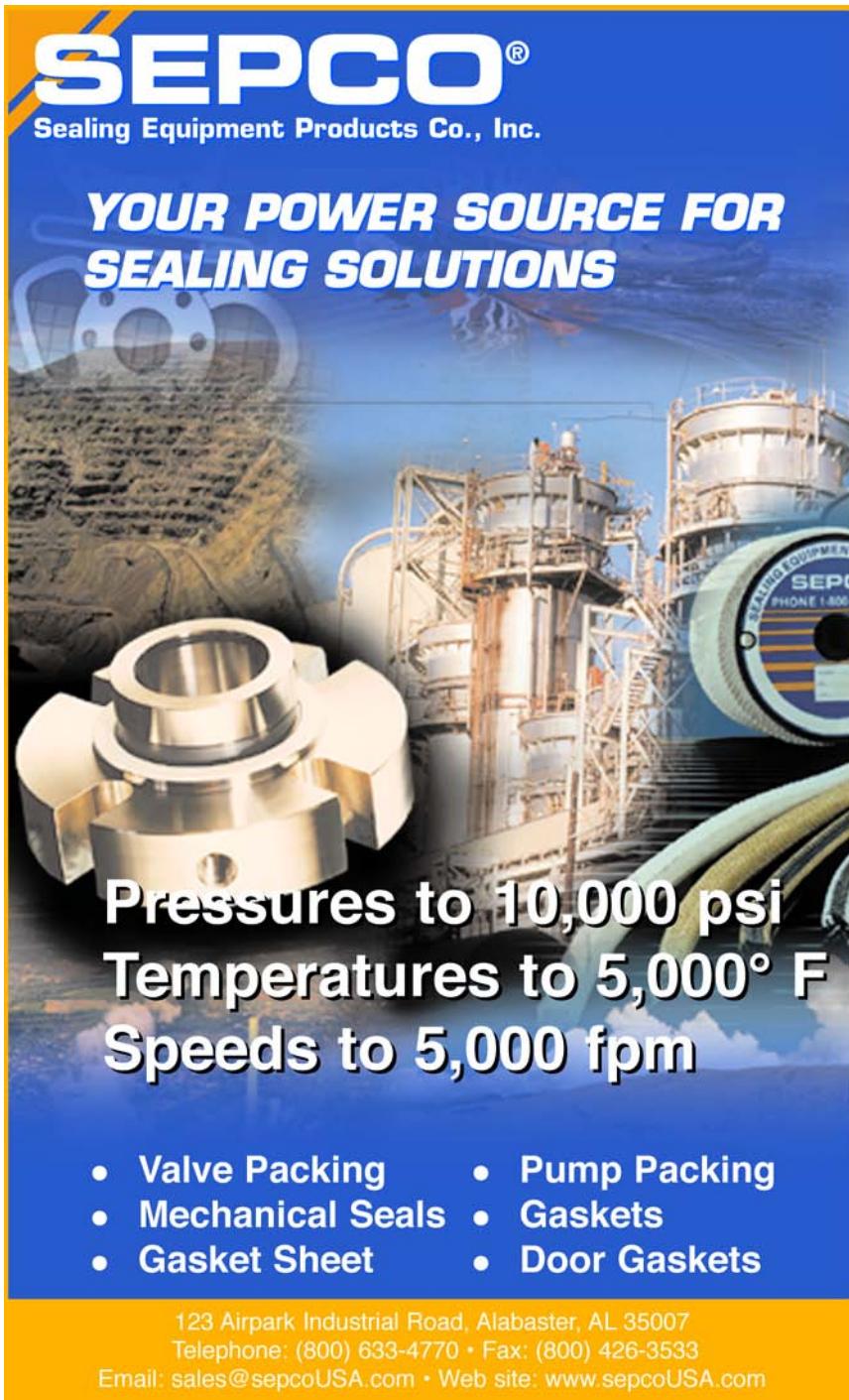
The firm hired Maddox Industrial Contractors (Indianapolis, IN) for installation. B.L. Anderson Company (West Lafayette, IN) subcontracted for equipment, which included modification of the existing SCADA system. The 20-ft x 10-ft pump station was provided skid-mounted for installation within the 60-ft diameter concrete section of the tank.

The Flowtronex station was selected in April, 2004, and delivered in September, 2004. Startup began during October and full operation was reached in November. The Insurance Service Organization was expected to visit for rating evaluation by the end of 2005 or in early 2006.

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