

Booster System Reduces Energy By A Third

By Joseph Sanchez

When 3180 N. Lake Shore Dr.'s existing domestic water booster system began to show its age, building owners had a decision to make, continue maintaining the building's original supply system or invest in an energy-efficient system that will reduce energy demand and pay for itself entirely on energy savings in just five to seven years.

Situated in the beautiful Lakeview East neighborhood of Chicago at 3180 N. Lake Shore Drive, this sought-after condominium development offers roomy, attractive units and the modern amenities and services. Built in 1954, this 23-floor high-rise houses



(R to L) Chief Engineer Tom Wojciechowski, Plumbing Contractor Bob DeGuiseppe of Chicago-based Great Lakes Plumbing, Architect John Kowalski of Klein and Hoffman located in Chicago and Plumbing Engineer Kent Locke, Jr., of Fox Valley Engineering in Fox River Grove, IL.

176 individual units and includes valet parking to accommodate residents with vehicles. The various floor plans consist of anywhere from 1 to 3+ bedrooms with an average master bedroom size of 215 square feet and a second bedroom of 132 square feet.

Since 1954, the building relied on a hydro-pneumatic booster system consisting of three pumps which filled a large horizontal storage tank. To control pressure, an air compressor pumped air into the tank and a pressure differential switch would turn the pumps on and off.

Although effective during its time of service, there were some disadvantages associated with the hydro-pneumatic booster system according to Chief Engineer

Tom Wojciechowski.

"Residents complained that the system was noisy due to the air compressor turning on and off throughout the day. Also if the compressor failed, the system would shut down leaving low water pressure to the building," said Wojciechowski.

Another disadvantage to the half-century old system according to Wojciechowski was the constant maintenance on the pumps, compressors and storage tank. Despite the maintenance, on occasion, the tank would leak requiring a system shut down so the tank could be drained and repaired. This can be a time consuming and lengthy process to repair.

Metropolitan Industries Chicago Sales Engineers worked closely with Plumbing Contractor Bob DeGuiseppe of Chicago-based Great Lakes Plumbing, Plumbing Engineer Kent Locke, Jr., of Fox Valley Engineering, Electrical

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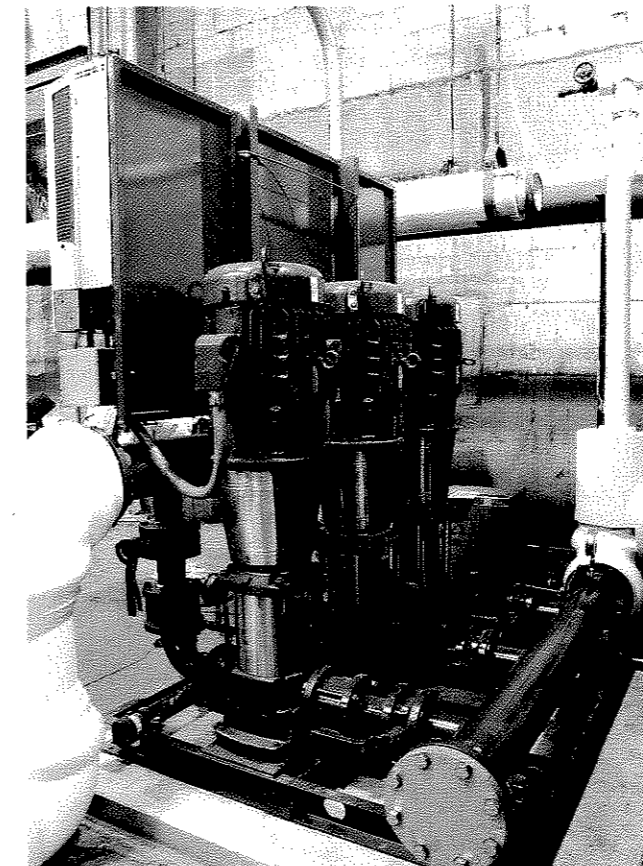
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Contractor Blaze Electric of Broadview, Ill., and Architect John Kowalski of Klein and Hoffman, Inc., to specify and install a variable-speed system that would reduce energy costs by 1/3 due to the system's ability to match demand precisely by using only the minimal amount of energy necessary.

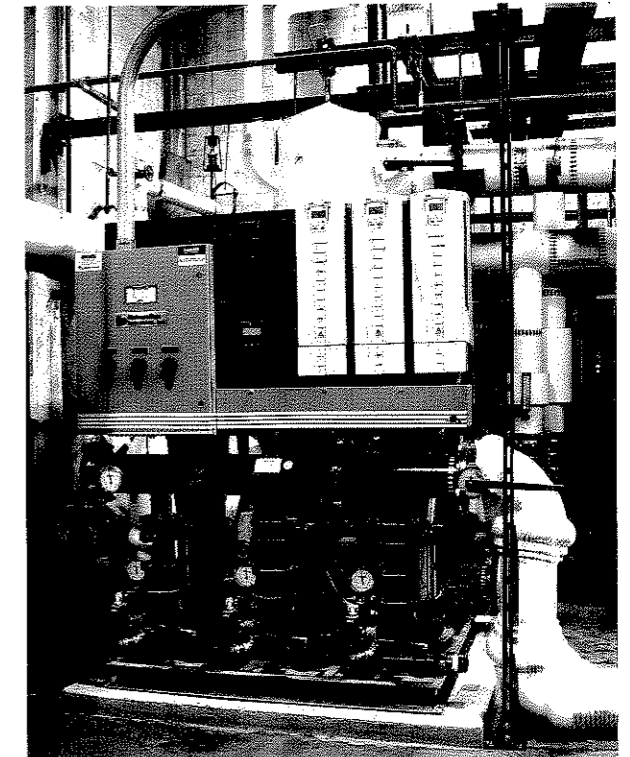
The team was able to design the new system based on a calculated flow of the building requirements and match the building pressure requirements with minimum pressure fluctuations regardless of flow.

The new variable-speed, triplex domestic water booster system consisted of three 25-HP vertical multi-staged pumps, each rated 230 gallons a minute (GPM) at a system pressure of 145 PSI. The new booster system uses 1/3 less power than the constant speed system saving the building owners money on energy costs while reducing maintenance costs. Two 119-gallon bladder tanks were installed as well in the top floor penthouse for low flow shut-down and stabilization of building pressure.

Besides the reduction in kilowatt usage and the saving



The new variable-speed, triplex domestic water booster system manufactured by Metropolitan Industries of Romeoville, IL, consisted of three 25-HP vertical multi-staged pumps, each rated 230 gallons a minute at a system pressure of 145 PSI.



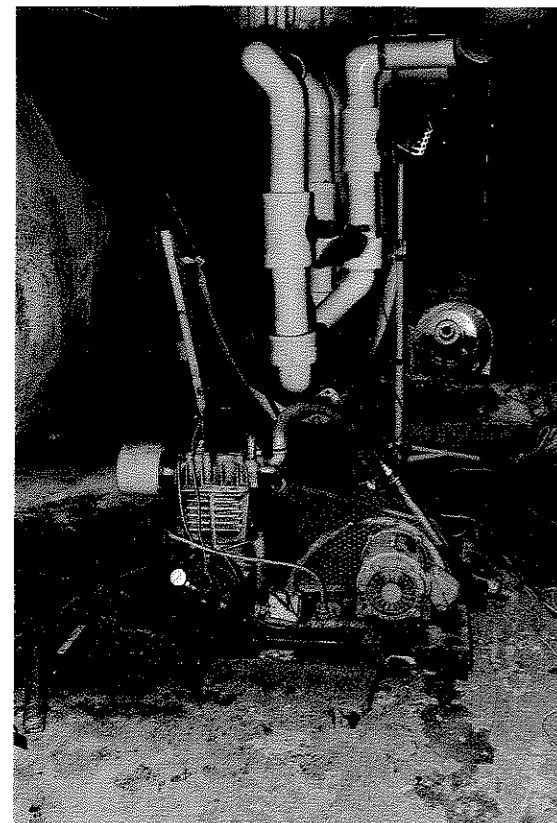
Within five to seven years, the new variable speed booster system will pay for itself entirely based on energy savings.

of approximately 33% in energy consumption a month, the pressures are stable and the control system is able to hold accurate pressure within 1-2 PSI. Using bladder tanks combined with variable speed drives on the booster system saves thousands of dollars a year on energy costs and adds life to the system because it does not run at a constant speed but rather a constant pressure, while varying pump speeds. The other major benefit using VFD control is that the life of the motor and bearings are extended in addition to extending the life of the overall system.

The air compressor and large space-consuming storage tank are now obsolete and will be removed, opening up additional storage space in the mechanical room. This is an inherent advantage of replacing a system with a large footprint.

The new system features high efficiency pumps and motors, variable speed drives and a Metropolitan Industries Programmable Logic Controller to operate pumps at peak hydraulic efficiency.

Within five to seven years, the system will pay for itself entirely based on energy-savings. In addition, the expected life of this system is over 25-30 years so eventually the system will not only pay the end-user for the cost of the system but it will also pay the costs to replace itself in its lifetime! ■



Pictured is the old hydro-pneumatic booster system that consisted of three pumps, an air compressor and a pressure differential switch to turn the pumps on and off.