



Hospital cuts energy used by HVAC pumps without disrupting operations

Armstrong Design Envelope technology delivered major savings, real-time visibility, and a payback of less than 16 months



HEALTHCARE



Case Study Highlights



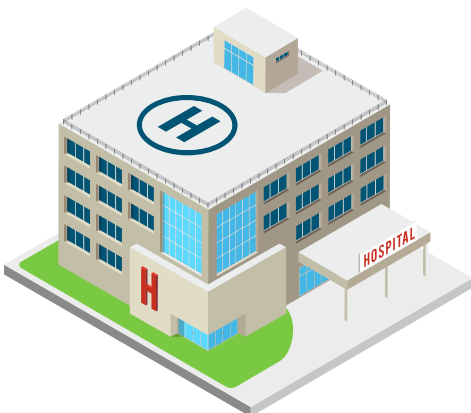
- **Replaced two 15-year-old conventional pumps** with Armstrong Design Envelope Sensorless split-coupled Vertical In-Line (VIL) pumps equipped with IE3 high-efficiency motors, enabling operation to respond to actual system demand rather than fixed manual control.
- **Completed the retrofit in two days** in a fully operational hospital, using a standby pump and a staged, one-at-a-time pump replacement to maintain load throughout, with zero disruption to hospital operations.
- **Delivered a 62% reduction in energy used by HVAC pumps** with power draw falling from 16 kW to 6.1 kW.
- **Achieved approximately ₹8 lakhs (\$8,268 USD) in annual cost savings** and an estimated 72.4 tons of CO₂ reduction, with a payback period of under 16 months.
- **Introduced real-time and remote visibility** into flow, head, and pump performance for the first time, through dashboard integration and remote monitoring.

A critical-care healthcare facility in northern India, upgraded a 15-year-old HVAC pump system that was still functional but increasingly inefficient and costly to run. Working with executing partner Nirvay Solutions Pvt. Ltd., the hospital replaced its conventional pumps with two Armstrong Design Envelope pumps, completing the retrofit in just two days without shutting down hospital operations.

Challenge

The hospital's existing HVAC pumping system had been in service for over 15 years. It was still operational, but had become expensive to run and difficult to manage. Power consumption was high, the pumps operated in manual mode and drew more power than actual system demand required, and maintenance costs were rising due to repeated repairs.

The facility manager had no visibility into the HVAC system for day to day operations. There was no way to track flow, head, or real-time performance, which made it impossible to assess system efficiency or identify opportunities to optimize operation. The core issue wasn't system failure; it was a system that was operationally adequate but inefficient, unmonitored, and increasingly costly to maintain.



Why Armstrong

Nirvay Solutions Pvt. Ltd., Armstrong's local representative and the project's executing partner, was already well acquainted with the benefits of Armstrong's Design Envelope technology, having successfully collaborated with Armstrong on prior HVAC and retrofit projects. That experience helped identify Armstrong as a strong fit for this application, and Armstrong was ultimately selected because it offered more than a pump replacement. It delivered an intelligent retrofit solution that combined energy efficiency, operational visibility, and retrofit simplicity in a single package.

Compared to conventional alternatives, several factors set Armstrong apart:

- **Design Envelope technology**, which allowed the system to operate based on actual demand instead of fixed manual operation.
- **Significant energy-saving potential** through efficient part-load performance.
- **Real-time visibility into critical operating parameters** such as flow and head, which the previous system lacked.
- **Remote monitoring capability**, enabling better control and ongoing performance tracking.
- **Simplified retrofit execution**, critical in a live hospital environment where shutdown was not possible.
- **Lower long-term maintenance** burden compared to the aging conventional system.
- **Strong technical evaluation and application support** during system assessment and solution selection.

Taken together, Armstrong offered a more complete solution than conventional alternatives: lower energy consumption, better system intelligence, reduced operating risk, and a faster lifecycle payback.

Approach

Because the hospital's HVAC system had to remain online throughout, the project's central challenge was executing the retrofit without any interruption to critical hospital services.

The project team addressed this with a staged installation:

- Used a standby pump to maintain system load throughout the installation.
- Replaced pumps one at a time, shifting system load accordingly as each new unit came online.
- Completed the full retrofit within two days, with no disruption to hospital operations.

The two new Armstrong Design Envelope pumps were installed with dashboard integration and remote performance tracking, allowing the system to shift from fixed manual operation to intelligent, demand-based pumping.

“Armstrong offered more than a pump replacement. It gave us an intelligent retrofit solution that combined energy efficiency, real-time visibility, and a simple installation process, which was critical in a live hospital environment where shutdown wasn't an option.”

— Vikram Bansal, Managing Director, Nirvay Solutions Pvt. Ltd.

Results

Since the upgrade, the system has delivered significant improvement in both energy performance and operational visibility. Over the course of the project, the Armstrong Design Envelope pumps delivered:



**62% reduction in HVAC
pumping energy consumption**



**16 kW – 6.1 kW reduction in
power consumption**



**72.4 tons estimated
CO2 reduction**



**₹ 8 lakhs in estimated annual
cost savings**

With a payback period of under 16 months, the retrofit delivered a fast commercial return alongside its operational benefits.

Broader Impact

Encouraged by the results, the customer is now considering upgrading the rest of its pumping system using similar energy-efficient solutions. The retrofit demonstrated that a live, mission-critical healthcare environment can achieve major efficiency gains without a full system overhaul, and established a foundation for continued monitoring and optimization across the facility's HVAC systems.

The project also reinforced the value of retrofit simplicity: replacing an aging, unmonitored pumping system with an intelligent, Design Envelope-based solution reduced maintenance burden while introducing a level of operational visibility the hospital had not previously had.

