



CASE STUDY: Northside Hospital Forsyth

# Achieving more resilient central plant operations

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**Demand Flow® chilled water optimization reduces energy consumption while increasing capacity for healthcare organization**

Northside Hospital Forsyth, located in Cumming, GA, provides exceptional healthcare services with a patient-centered approach. Their mission is to deliver high-quality, compassionate care to every individual they serve from their 389-bed hospital, which is staffed by 800 physicians and 3,700 employees. With a vision of being the leading provider of innovative and comprehensive healthcare in the region, Northside Hospital values excellence, integrity, collaboration, and respect, ensuring the well-being and satisfaction of their patients and the communities they serve.

As the organization continues to grow and expand, so too does their need improve the overall resilience and reliability of their facilities, which operate 24/7/365. This is particularly true for Northside’s central plants, as any hospital depends on reliable cooling infrastructure for high-quality patient care and effective, efficient operations. Moreover, hospitals use tremendous amounts of energy in the delivery of patient care; round-the-clock operation, intensive medical equipment usage, lighting, HVAC operations, maintaining optimal indoor air quality and infection control measures, emergency power systems, and high-demand services all contribute to hospitals’ high energy consumption and therefore utility costs.

“Over the last few years, we have seen dramatic increases in our utility rates, especially in the summertime,” says Thomas W. Doenitz, System Director of Facilities Operations for Northside Hospital. “Due to the size of our operation, we have real-time pricing programs, which means that our cost fluctuates with the market based on utility grid demand. Unlike other facilities, though, we must run our plant operations consistently year-round. When it’s hot, we can’t simply dial back the air conditioning.”



**Healthcare sector + climate change**

In the U.S, the healthcare sector contributes at least 8.5% of national carbon emissions, according to the New England Journal of Medicine. Some experts estimate that burning of fossil fuels for the healthcare industry accounts for approximately 100,000 U.S. deaths each year (StatNews).

As such, Northside Hospital Forsyth sought a partner who could help them overcome the challenges of energy consumption and utility costs while also creating more resilient operations for the future. Since 2021, they have worked with Siemens Smart Infrastructure to limit energy consumption of their chilled water plants, as well as to optimize their performance via the patented, proven Demand Flow solution.

### **Significant energy savings, short payback period key selection factors**

The hospital provided Siemens with energy consumption and utility trend data for their two main Central Energy Plants (CEP 1 & 2), to initiate a comprehensive engineering analysis of the facility's chilled water plant operations. Ultimately, Siemens engineers recommended the implementation of Demand Flow at both plants alongside the installation of variable frequency drives (VFDs) on all condenser and chilled water pumps, as well as the application of flow meters, differential pressure sensors, power meters, and temperature sensors to support Demand Flow sequences of operation. The project also modified the interoperability of the two plants to help ensure optimal operations and better reliability. In addition, upgrades of the steam preheat control valves on 21 Air Handling Units eliminated simultaneous heating and cooling.

The initial energy analysis revealed that the overall project could result in annual electrical savings of \$111,000 and natural gas savings of \$27,000. An additional utility incentive / rebate would reduce the overall project cost by more than \$176,000, bringing the project's payback period to 3.2 years.

Impressed by the sizeable savings and associated short payback period, Doenitz explains that the hospital engaged a third-party commissioning agent to independently validate the Demand Flow solution prior to its implementation.

"The bottom line is that hospitals simply cannot have downtime. We didn't want to implement anything that could jeopardize our compliance; interfere with the experience of patients, staff, or visitors; or disrupt our operation in any way," he says. Satisfied both with the Demand Flow proposal from Siemens and the third-party assessment, Doenitz requested funding to move forward with the implementation.

### **Successful implementation with no interruptions to operations**

In the interest of transparency, the facilities teams worked with the hospital's internal communications team to ensure everyone working in the hospital knew that this project had started and set the appropriate expectations.

Despite the team's initial concerns about disruptions, Doenitz notes that the entire project's implementation was "uneventful." "Candidly, it was a high-anxiety time for me, but nothing came of it. We had no impact on temperature or humidity in critical spaces, and no complaints about comfort whatsoever," he says.

### **Understanding Demand Flow**

Demand Flow optimizes water-cooled, central chilled water systems with centrifugal or screw type compressors with Siemens patented Variable Pressure Curve Logic (VPCL) in our Demand Flow controller. VPCL algorithms couple with variable speed drives installed on all the chilled water pumps, condenser water pumps, and cooling tower fans to optimize system operation without sacrificing building comfort to achieve maximum energy savings. Demand Flow works with any OEM chiller manufacturer. It does not breach the operating limits of the chillers and therefore does not void warranties.

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### Demand Flow energy savings exceed projections

Today, Northside Hospital Forsyth receives weekly reports detailing performance and operations within the central plant. Now the plant is consuming 21.6% less electricity, which is particularly important when considering that the organization now pays 9.7 cents per kWh of electricity, compared to 5.3 cents when the project was initiated in 2021.

Improvements enabled by Demand Flow contributed to a significantly higher-than-expected utility incentive, reducing the initial project cost by more than \$209,000 – about 19% better than project projections. This combination of factors also means that ongoing savings from Demand Flow are approximately 6.5% better than expected, even in the face of significantly higher utility costs.

“It’s always fun to open these reports and see the dollars we don’t have to burn,” says Doenitz.

### Increased capacity creates redundancy, resilience in central plant operations

Implementing Demand Flow has also had a positive impact on the hospital's central plant redundancy. Whereas prior to the project, the central plant needed four operating chillers to deliver sufficient chilled water, today they can operate with just two of their chillers.

“Redundancy like this is more important than ever. If a chiller were to go down, it would be seamless for us to maintain our operations due to the benefits gained from this project. Floods, fire, major equipment issues – these could all be devastating for a hospital. That’s why having N+1 capacity for your critical plant equipment is a goal for many healthcare organizations. We’ve now effectively added chiller capacity through the improvements enabled by Demand Flow,” Doenitz explains.

He goes on to say that because the central plant equipment does not need to run as hard now, there could also be benefits to the organization in terms of equipment life.

### Demand Flow prepares the hospital for continued growth

Forsyth County ranks among the fastest-growing counties in the U.S., and Northside Hospital will continue to expand its facilities and services to best serve the health and wellbeing of this community.

He concludes: “Our savings model was done before we had dramatic increases in our utility rates, and the idea that utility prices will go back down is unlikely. Still, the savings Demand Flow generates for us are real, and we anticipate needing more energy in the future – adding electric vehicles to the mix will exacerbate this further. Demand Flow is creating energy savings we can realize in perpetuity, and all in all, it’s been a great investment for us.”



#### Key Benefits

- \$209,000 utility incentive in Year 1
- \$138,000+ annual utility savings
- 21.6% actual electricity savings; 6.5% better than predicted
- N+1 redundancy in chiller capacity

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