



SIEMENS

Ingenuity for life



Demand Flow[®] Chilled Water
System Optimization

Intelligent. Powerful. Proven.

usa.siemens.com/demandflow



A powerful solution to reduce energy consumption and improve operations.

Siemens Demand Flow Chilled Water System Optimization offering is a unique, patented, and proven optimization strategy that reduces energy consumption, improves occupant comfort, and extends equipment life. To achieve maximum energy savings, Demand Flow CHW from Siemens employs variable speed pumping on the chilled water and condenser water pumps, and operates variable speed cooling tower fans, without the need for expensive chiller drive options.

The Demand Flow® CHW offering provides significant energy savings in water-cooled centrifugal or screw type chilled water systems—typically 20-50% energy use reduction with measured total chilled water system performance as low as 0.33 kW/ton. Demand Flow CHW is chiller brand agnostic and can be implemented on any existing building automation system.

Demand Flow CHW:

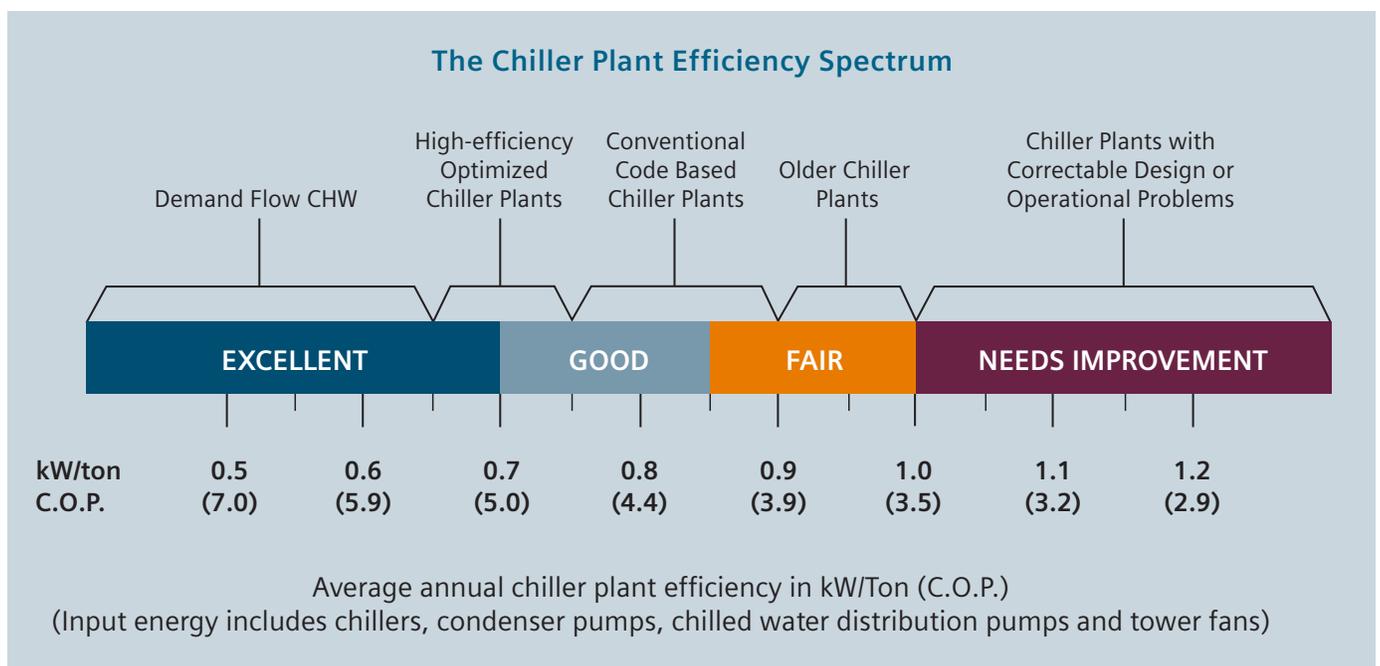
- Offers a holistic approach for optimizing the entire chilled water system, including potential air-side savings
- Does not shift energy from one sub-system to another, but reduces overall total system energy consumption
- Often increases the deliverable tonnage of the chilled water system, allowing for more effective cooling with less equipment, thus increasing system redundancy
- Does not sacrifice comfort or process cooling efficacy to obtain the energy savings
- Simplifies system control methodology for more intuitive operation of plant equipment
- Potentially extends equipment life through less wear and tear on the equipment

Siemens Demand Flow CHW measures and verifies each sub-system’s energy consumption as part of the total energy usage. Siemens often finds the opportunity to deliver colder chilled water to the coils while providing significant energy savings. This colder deliverable chilled water is especially beneficial in potentially reducing air-handling fan energy in VAV systems.

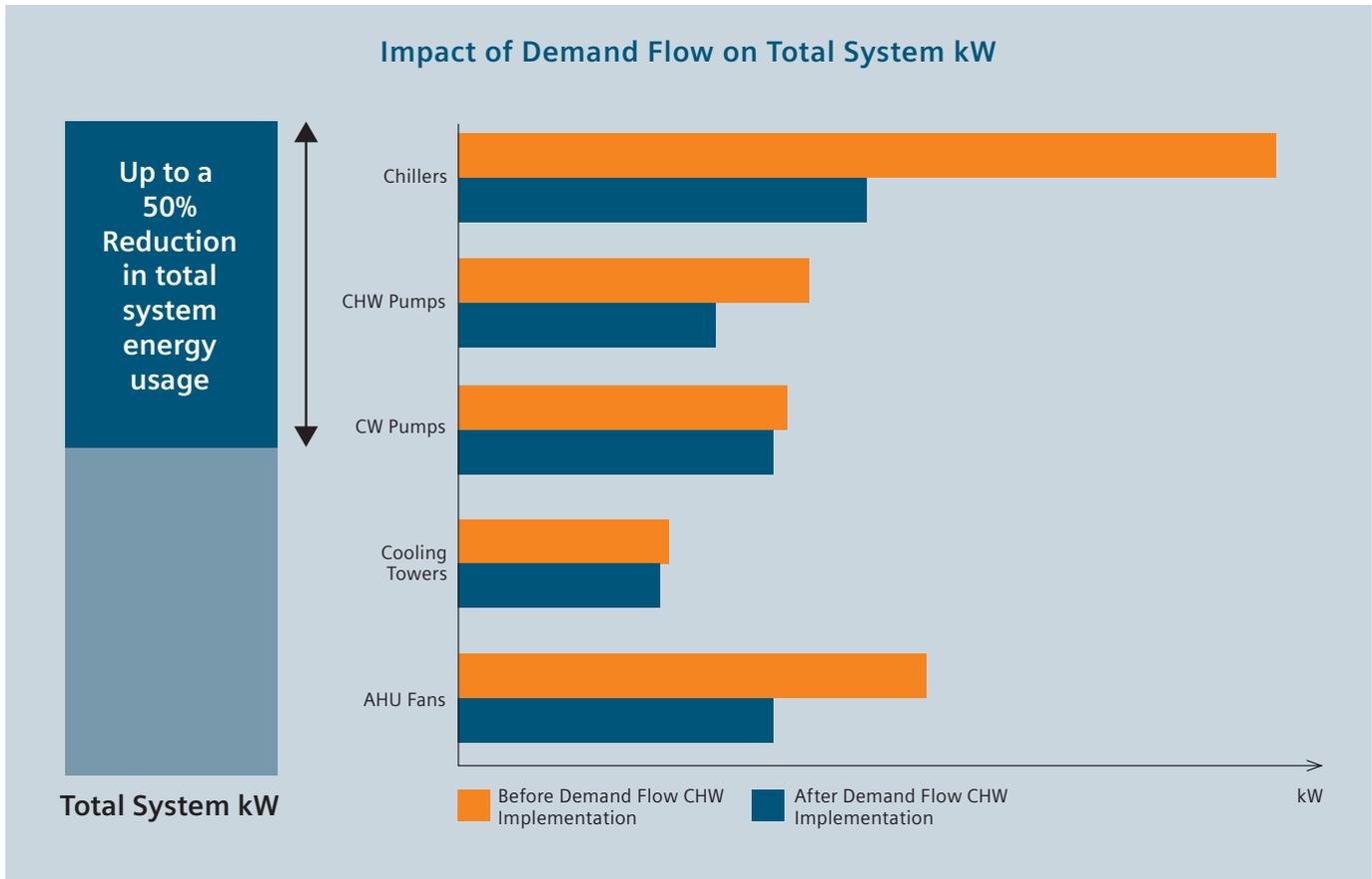
Typical Operational Shortcomings in Chilled Water Systems

Across the US, Siemens has found many chilled water systems that are plagued with shortcomings, which cause:

- Diminished deliverable tonnage due to:
 - **Low Delta-T Syndrome**, which contributes to a perceived need for more equipment
 - **Chilled Water Reset**, when chilled water temperature is raised it can reduce cooling coil capacity
- Excessive energy consumption due to:
 - Excessive chiller lift
 - Bypass of chilled water flow
 - Constant volume pumping
 - Untuned chilled water control system components
 - Non-optimized cooling towers
 - Inefficient and overly complex sequencing
- Diminished occupant comfort or ineffective process cooling, which can lead to reduced employee productivity or reduced profitability
- Decreased equipment life
- Inability to measure and maintain sub-system performance



Source: "All Variable Speed Chiller Plants," ASHRAE Journal, September 2001



Many facilities are limited to how cold they can drive their tower water supply temperature in low wet-bulb conditions. This limits the ability to minimize lift in the chiller and reduce chiller energy. Demand Flow[®] CHW takes a holistic approach to optimize the entire chilled water system (Chillers, CHW Pumps, CW Pumps, CT Fans, AHU) in real-time relative to load, without having to rely on variable speed chillers to maintain the required minimum lift.



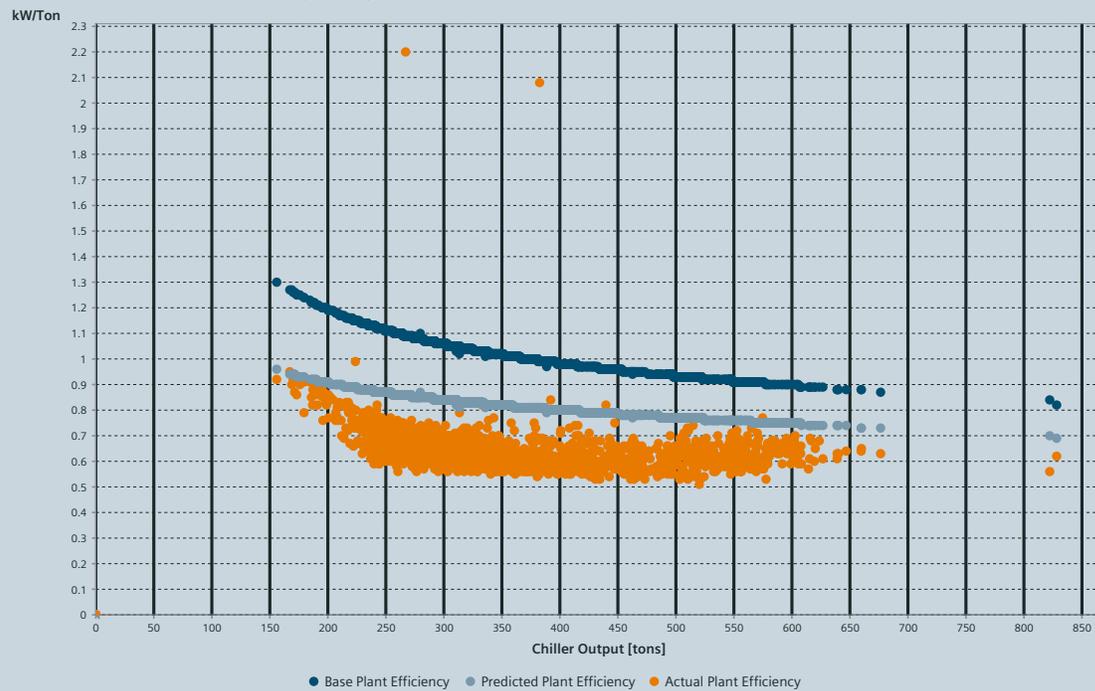
Uncompromised Performance for Improved Operations

Demand Flow CHW delivers improved energy efficiency and operational improvements throughout your facility, including:

- **Improved Occupant Comfort:** Demand Flow CHW optimization solves “Low Delta-T Syndrome” and potentially allows your system to deliver colder chilled water year-round. With Demand Flow CHW, your building’s humidity and temperature levels can be more effectively controlled, creating a more productive, comfortable indoor environment. The energy savings, coupled with improved environmental quality, easily contribute to achieving most organizations’ potential energy and sustainability goals and objectives.

Siemens Navigator Cloud-Based Energy Reporting

Demand Flow Plant Performance (in Tons)



Total water system component performance can be measured via Siemens Navigator

- **Extended equipment life:** Demand Flow CHW's patented "Variable Pressure Curve Logic" Technology empowers the conversion of constant speed condenser pumps and chilled water pumps to variable speed through the installation of Variable Frequency Drives (VFDs). The Demand Flow CHW algorithms enable the VFDs to maintain optimal system differential pressure, reduce equipment runtime, and increase system deliverable tonnage—all of which combine to reduce maintenance requirements and extend the life of your equipment.
- **Simplified chilled water system operations:** Demand Flow CHW automatically optimizes and automates all plant functions and is accessible through a unique Graphical User Interface (GUI). Sequencing of equipment becomes much simpler, thanks to optimal operation of all plant equipment at any given load, which enables simple lead/lag equipment sequencing based on run-hours.
- **Intuitive Reporting:** Demand Flow CHW measures each chilled water system component either through kW outputs on the VFDs or through the installation of Digital Energy Monitors. This sub-metered data is organized and viewable via the internet through Siemens Navigator cloud-based platform. Navigator enables better management of ongoing operations to meet energy reduction and sustainability goals.





Applying Siemens Technology and Expertise

Demand Flow® CHW technology has been proven successful in more than 650 installations across the globe. From hotels, manufacturing, and commercial office spaces to hospitals, universities, pharmaceuticals, and data centers, Siemens has been able to deliver reduced energy consumption, improved occupant comfort, simplified chilled water system operations, and extended equipment life by applying the Demand Flow CHW strategy.

To support our growing list of Demand Flow CHW customers, Siemens has created the Demand Flow Center of Excellence team. This team of subject matter experts support our more than 600 trained professionals, including energy engineers and sales professionals, located in our more than 125 local branch offices across the US and Canada.

What Siemens has Learned		
Common System Characteristics	Inherent Shortcomings	Demand Flow CHW Solution
Operate at design intent conditions only 5% of the time (per ARI standards)	Inefficient and costly plant operations 95% of the time (per ARI standards)	Demand Flow CHW puts the entire system in its most efficient state year-round, regardless of load
Comfort is often sacrificed to obtain efficiency, or efficiency is sacrificed to obtain comfort requirements	Uncomfortable occupants – reduced productivity or utility bill rise	Demand Flow CHW does not sacrifice comfort to achieve energy savings; our customers do not have to compromise
Chillers not operating at design temperature splits	Plagued with “Low Delta-T Syndrome”	Solves Low Delta-T Syndrome and increases system deliverable tonnage
Continuous full speed operation of some plant equipment	Decreased equipment life	Less wear and tear and reduced run-time – improved equipment life and less energy usage

**Published by
Siemens Industry, Inc. 2021**

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1000 Deerfield Parkway
Buffalo Grove, IL 60089
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Part # 153-BPS-884 (01/2021)

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