



DRIVING MECHANICAL OPERATIONAL EFFICIENCY

CloudOps – Mechanical: A HVAC Analytic Service from Siemens

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Building systems deviate from their intended design over time, resulting in decreased performance and reliability. And, as digital technologies continue to affect our everyday lives, we have begun to see an evolution in how building owners and operators approach system maintenance and take advantage of data analytics to drive operational efficiencies.

Traditional maintenance approaches are failing today's businesses

Because the majority of all maintenance programs employed by facilities are reactive in nature, the cost to repair or replace equipment is typically much higher than if problems were detected and fixed earlier—not to mention the costs associated with lost productivity during downtime.

CloudOps – Mechanical from Siemens

To overcome these issues and to take advantage of data analytics, we are seeing more cases of condition-based, outcomes-oriented services. In these cases, service is conducted based on deviations from pre-defined parameters. CloudOps – Mechanical, one of Siemens HVAC Analytic Services, supplements traditional planned mechanical systems maintenance with analytics and rules-based information. You gain a more efficient and focused maintenance approach, and because Siemens “touches” the systems more frequently, we can address problems as they occur.

Addressing problems as they occur

Traditional mechanical service involves routinely dispatching a mechanic to inspect equipment; on the predefined service day, the mechanic visits the control panel, reviews available information (e.g. running hours, temperature), and checks for flow, leaks, and so on.

Highlights

Supplement traditional, planned maintenance with analytics and rules-based information to address problems as they occur.

Key benefits

- Drive mechanical system efficiency with a more efficient, focused maintenance approach
- Address problems as they occur
- Increase system uptime and extend equipment lifecycle
- Greater visibility and transparency into systems and improved analysis through increased touch points
- Use expert rules to identify issues before they affect operations

Common KPIs

- Mechanical system reliability
- Reduced operating costs
- Focused maintenance requirements

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But with CloudOps – Mechanical, Siemens can set up a building's mechanical systems data in our cloud-based analytics platform to monitor equipment data on a monthly basis. This specific, mechanical rules-based monitoring is supplemented by focused, as-needed onsite maintenance.

Increase uptime with fewer business and facility interruptions

Rather than monthly, onsite visits from a technician, building owners can benefit from more frequent analysis of critical building automation controls.

- up to 75%ⁱ fewer equipment breakdowns
- up to 80%ⁱ less time spent reacting to emergencies
- potential for 95%^j system availability or better

Driven by outcomes

By taking an outcome-based approach to understanding your business needs and goals, Siemens can establish key performance indicators (KPIs) aligned with your equipment, spaces, and goals.



Equipment options available

- AHUs
- Boilers
- Chillers
- VAVs

Secure, flexible remote connection

- Flexible – Siemens can connect wirelessly, via VPN client, virtual network, or separate network connection.
- Secure - **ISO 27001 Certification** applies to VPN client and virtual networks to specify the requirements for establishing, implementing, maintaining, and continually improving an information security management system within the context of the organization.

CloudOps Mechanical Executive Summary

CloudOps Mechanical is a pre-packaged set of fault detection diagnostics that can be applied to the mechanical water and air-side equipment throughout your facility. These systems are the most common of your HVAC system and include the following components:

- Chiller Plants (Chillers, Cooling Towers, and associated Pumps)
- Boiler Plants (Boilers and associated Pumps)
- Air Handling Units (AHUs – Fans, motors, dampers, valves, strainers)
- Terminal Units/Comfort Systems VAV Boxes and Constant Volume AHUs

CloudOps Mechanical focuses on identifying if your mechanical systems are working properly and that the overall comfort is being delivered in the spaces throughout your facilities. This service continually monitors the data from your automation system to uncover mechanical issues before they impact the indoor environment. These issues at a minimum cause impact your HVAC and control equipment's ability to deliver the desired environmental conditions, but if left uncorrected, they may result in premature equipment failure.

The benefits of this Analytic Service may apply to these areas:

- Maintain higher system reliability while avoiding service interruptions
- Prioritize customer problem resolution
- Shift from a reactive to proactive maintenance
- Optimized environment for critical spaces and equipment
- More frequent analysis of systems compared to traditional periodic inspections

CloudOps Overview

CloudOps uses Fault Detection and Diagnosis (FDD) to employ a rules-based analysis of system performance. It helps to identify areas where we can focus resources before issues become more critical and expensive to address. CloudOps Mechanical has four levels of fault priority. Each fault level corresponds to a different phase in the failure probability curve. Ranging from Level 1 for minor issues that could be correct but has low urgency to level 4 faults that require immediate action to prevent a negative impact on the equipment and the indoor environment.

Figure 1: Fault Priority Levels

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Fault Prioritization

On the following pages we present the detailed information that will be used to reset priorities and uncover issues that require additional attention before the next reporting period.

Many faults occur on your site every day, but the power of Siemens Fault Detection and Diagnostics lies in the ability to prioritize high impact issues and remotely repair them.

Total Faults by Priority Current Period

Priority Level	Chiller Plant	Boiler Plant	Air Handling Units	VAV Terminal Units
4	2	0	2	12
3	8	1	2	24
2	6	3	3	35
1	4	2	1	29

Total Faults by Priority, Compared with Previous Period

Figure 3: Current vs Previous Period Fault Comparison

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Sample CloudOps – Mechanical Proven Outcomes report

ⁱ U.S. Department of Energy. "Operations & Maintenance Best Practices: A Guide to Achieving Operational Efficiency." Federal Energy Management Program, August 2010.

ⁱⁱ ReliabilityWeb.com. "10 Ways to Reduce Reactive Maintenance."