



How to Apply SiteWatch Monitoring

Off-Hour Energy Use

Access energy data through SiteWatch 360 and view loading profiles for a specific period of time. Observe trends in data and confirm if when and how a machine operates matches the site's expectations

View a single machine, group of machines, a custom grouping such as a production line, a panel, or zone energy usage, allowing comparisons to other machines or group. Summarize energy use during non-production or unoccupied hours to quantify wasted energy, and use the platform to enable alerts and reports to indicate energy waste and ensure changes made to save energy persist

Observation: Operations management suspects excessive energy usage during overnight and weekend hours

Action: Establish expected load profiles for equipment, observe machine, panel, and site operations over time, and compare actual energy usage with expected energy usage

- Operators may not understand the bottom-line impact of leaving machines energized
- Wasted energy is also wasted machine life. Motors, fans, and pumps have an expected lifespan and leaving on when not in use hastens equipment replacement
- Once savings are found from operating data, monitoring over the long term ensures the savings persist

Condition-Based Monitoring

Condition-based monitoring improves maintenance programs by employing real data to planned activities

- Maintenance is based on machine operating patterns
- Early disclosure of machine degradation can avoid unplanned downtime
- Identify factors that can shorten machine life or signal impending problems
 - Number of start-stop instances and run hours
 - Current (amp) draw and phase imbalance
 - Vibration and temperature changes over time

Observation: Remote motors are underperforming, causing standby machines to operate

Action: Review amp, vibration, and temperature data and track degradation over time

- Is the unit cycling excessively? Is the issue with the motor or attached pump/fan?
- Are system set points causing the motor to cycle excessively?
- Does motor temperature spike above acceptable limits during regular operation?
- Are lubrication issues causing a temperature spike and excessive vibration?

Start/Stop Cycles

Automated weekly reports summarize how often tracked machines start and stop during the reporting period

- Excessive start/stop cycling can indicate controls or other issues that may be missed by maintenance personnel
- Cycling can wear motor components, resulting in a reduced useful life for equipment

Observation: Excessive cycling on motors is causing maintenance issues

Action: Use reporting from SiteWatch 360 to track cycling on monitored machine

- When is the motor starting and stopping?
- Using reporting, track how many times per day, week, or month a unit cycles
- With automated reporting, compare reports over time to see when increases in cycling occur, and whether they are related to weather, production, or something else

Machine Hours

This automated Power Radar report is delivered at the end of a calendar month and tracks run hours for each machine

Observation: Accurately measure machine “on” time

Action: Coordinate maintenance activities based on tracked machine run hours generated automatically from data

- Replace manual or hand-logged run hours with hours from real data
- Improve maintenance planning and schedule parts orders based on expected running time

Phase Imbalance

View data and generate automatic reports highlighting phase-by-phase amperage and if an imbalance exists or worsens over time. Phase imbalance can indicate a critical maintenance issue or imminent failure or may be part of the normal operation of a motor or machine. Tracking the difference in phase amps over time is essential for mission critical, difficult to replace, or expensive equipment

Observation: Devices with excessive phase imbalance, or an imbalance that increases over time, will have a shortened lifespan without maintenance intervention

Action: Determine the root cause of the imbalance and consider maintenance actions or planned machine replacement

- Monitoring per phase is required (3 sensors per machine)
- Thermography at the distribution panel may find over-amping that is impacting of machines, signaling the need to secure wire connections or review distribution infrastructure

Managing Peak Demand / Scheduling Equipment

Heat Map from the Power Radar platform shows when peak demand occurs – i.e., dark red blocks. Understanding when and how these peaks are set can help a site plan machine operations in a way that avoids setting peak demand. Avoiding these charges can impact electrical energy costs for months or a year, or more

Observation: Knowing when peak electrical usage occurs is useful for managing demand charges, both on monthly bills and when purchasing energy (through “capacity tags” used by energy brokers). Excessive demand can increase utility bills by 30% or more

Action: Use plot views and reporting to understand when and how peak demand usage is set

- Monitoring the largest users (significant energy users) and panels allows the site to track where energy is used during operations
- Review peak demand setters with operators; which equipment can shift to “off-peak” times? Can equipment be staged to avoid a large spike in usage?

Benchmarking / M&V

Energy data can be used to determine a baseline, for savings from energy reduction projects or to compare similar equipment within a facility

Observation: The site has multiple instance of the same equipment, wants to apply energy data to generate a benchmark for comparing performance

Action: Compare energy use when running and when in standby, and download data to compare directly to production to generate a key performance indicator of kWh per production unit

- Identify the most and least efficient units, whether air compressors, pumps, mixers, or production equipment
- Why is equipment more or less efficient? Age or the machine? Usage? Is the equipment dependent on direct operation by a person or automated?
- Benchmark over time with permanent energy monitoring. SiteWatch sensors remain in place to ensure efficiency improvements persist

Equipment Failure Alert

Erratic operation of a heating element in an oven or furnace may results in uneven heating and stress on crucibles or other parts of the melting process. Overheat or under-heat can result excess energy use, low product quality, or even catastrophic failure of components

Observation: A customer furnace cycles ON for 4 hours for heat treatment during the finishing process. Excessive curing can degrade the final product, so ensuring the 4-hour cycle is maintained is critical for quality control

Action: For instances where the furnace exceeded the cycle time, find out what caused the operation

- Use SiteWatch to set a cycle-period alert when kW exceeds a setpoint for more than 4 hours
- Track energy usage on heating elements to ensure even heating or product. Are certain electrodes or heat-distributing fans failing prematurely, causing uneven heating?