

How To Decrease Equipment Energy Consumption

shift end (6PM), if MOTOR operates for greater than 15 minutes continuously, then identify this as a fault. This continuous running fault is logged and available for display in a fault summary table for the facility maintenance depart to take corrective action.

Another common issue that can effect electrical motors is over-cycling, which means they start and stop too many times within a specified period of time such as per day. This could be caused by faulty setpoints, improperly operating sensors, or improper control settings such as the hysteresis around the setpoint. This type of performance can negatively impact equipment in several ways: shortened equipment life due to the excessive cycling, increased energy consumption especially higher demand when starting, and lack of steady state operation that can decrease overall energy efficiency. An FDD system can detect this type of fault easily by continuously monitoring the number of equipment starts in a 24 hour period.



In addition, another issue that can impact fans and pumps is inefficient performance as compared to design specifications. All fans and pumps have a performance curve and chart that will indicate expected performance (air output or pump flow rate, for example). A good FDD System can have the specific information for each fan and pump loaded into a database and then the FDD system can evaluate actual performance against expected performance. A fault in this area could indicate a wide variety of issues such as clogged or partially blocked filters, excessive impeller wear on pumps, improper valve and damper settings, etc.

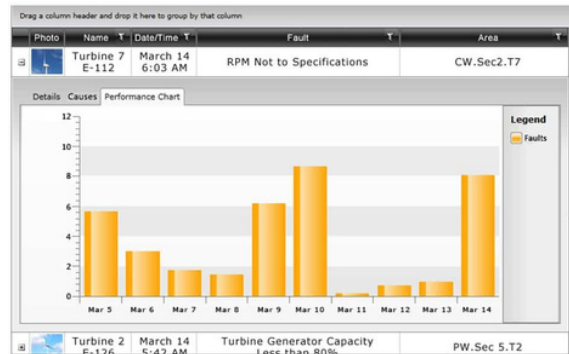
The Fault Diagnostic system will also offer some additional benefits in addition to detecting operational faults:

1. Faults will be logged and summarized in a table for each piece of equipment – see screen capture below of a fault detection system for wind turbine

Drag a column header and drop it here to group by that column				
Photo	Name	Date/Time	Fault	Area
	Turbine 7 E-112	March 14 6:03 AM	RPM Not to Specifications	CW.Sec2.T7
 Name: Turbine 7 Area: Cape Cod, MA Faults this week: 8				
	Turbine 2 E-126	March 14 5:42 AM	Turbine Generator Capacity Less than 80%	PW.Sec 5.T2
	Anemometer MW-21	March 14 3:11 AM	No Data	CW.Sec 1.T8
	Transformer Reahco S11	March 14 3:06 AM	Overheating	TX.Sec 9.TR2
	Turbine 2 E-126	March 14 12:13 AM	Turbine Generator Capacity Less than 80%	PW.Sec 5.T2

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2. Faults will be logged into a database and available for historical analysis. For example, a chart summary of the # of faults per day can be viewed for each piece of equipment (as seen in the screen capture below)



3. A cost for not correcting the fault can be calculated for each fault. This can be used to prioritize work order schedules to correct the most costly fault first and also provides the technician with an expected reason for the fault leading to more efficient corrective actions. With less time spent on diagnosis and more time on corrective actions, the maintenance team is also more productive.

4. A good FDD system does not require the change out of any existing hardware or systems – it is designed to support almost any type of communications protocol and interface with any hardware platform.

FDD is proven technology and is being widely applied in Building Automation Systems. There are documented examples where a building energy consumption has been reduced by ~15% primarily as a result of the operational intelligence provided by the FDD system. These FDD systems have been implemented without changing anything related to existing control systems. The FDD system takes advantage of the data points that already exist within the existing control system.

In summary, reducing equipment energy consumption is fairly straightforward:

Decision that being Energy Smart is in the best interest of the facility.

Audit of energy consuming equipment in the facility – how many and what types of equipment

Review of equipment list with FDD software supplier

Project planning – how to deploy (locally or cloud) a solution; supplier provided configuration services or internally provided services

Development of performance dashboards and publishing of dashboards for access on desktop and laptop computers using a web browser, smart phone or tablet. Dashboards and equipment information can also be viewed using wearable technology.

If reducing equipment energy consumption is of interest, contact the experts at Cross Automation for additional information including FDD software product briefs and application stories with typical results using FDD software.