Building Analytics Success Story
Hewlett Packard Enterprise

Hewlett Packard Enterprise
in partnership with
ISS

In 2016, Hewlett Packard Enterprise (HPE) embarked on a fault detection and diagnostics (FDD) pilot implemented by their facilities management provider, ISS Facilities Services (ISS). The team learned a lot from the pilot program and received the the green light to expand FDD in the portfolio. The primary goal was energy savings and getting a good return on investment, however additional benefits emerged. FDD led to reduced hot/cold calls and improved maintenance efficiencies as the team went deeper into using FDD in an ongoing, monitoring-based commissioning (MBCx) process.

ISS chose an FDD vendor that worked with them to map most of the BAS points at each of HPE's sites so they could run diagnostics on most HVAC equipment at 5 minute intervals. The vendor installed the FDD software according to HPE's system configuration and controls strategies to diagnose dozens of HVAC issues.

What is FDD?

Fault Detection and Diagnostic (FDD) software identifies buildings with suboptimal performance by analyzing building automation system (BAS) data. FDD is one type of energy management and information system (EMIS).

Using FDD, the team discovered issues such as scheduling air handlers off when zones were unoccupied, minimizing simultaneous heating and cooling, and identifying broken valves and sensors. But FDD is not only keeping tabs on things that aren't working, the software also recommended operational improvements. For example, the need to add VFDs and implement temperature and pressure reset control strategies. Prioritizing the work based on estimated energy cost for each fault has been key.

FDD is a great opportunity for facilities management companies. In the future it will be part of the standard service package - you will need to have an FDD solution.

- Jeremy Macdonald, Director, ISS Facilities Services

Quick Facts

EMIS locations: Colorado, Massachusetts, Wisconsin, and Puerto Rico

Building type: Office, lab, data center

Floor area with EMIS: 2 million sq ft

Total buildings with EMIS: 15 buildings at 5 sites

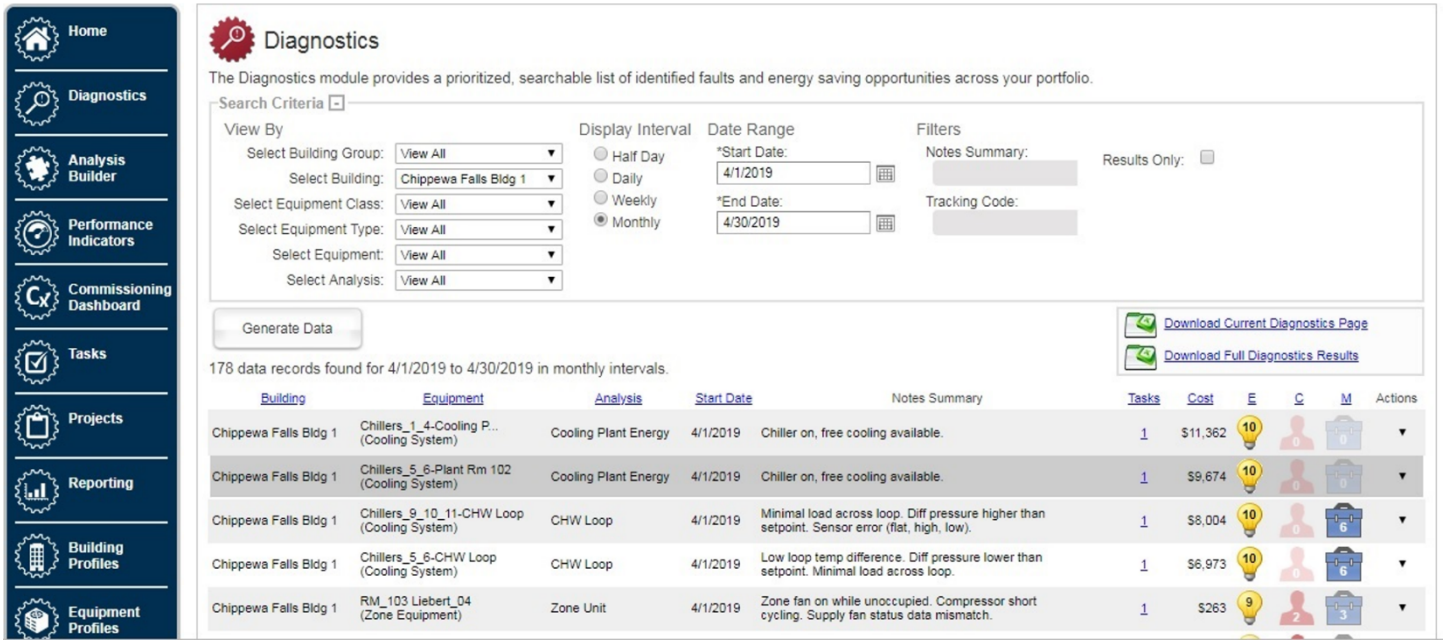
Energy savings: 9% energy savings at 1 site reporting

FDD Tool: KGS Clockworks

MBCx Service Provider: ISS Facilities Services

Smart Energy Analytics Campaign Recognition: Best Practice using FDD in a Portfolio

Hewlett Packard Enterprise in partnership with ISS Facility Solutions was recognized by Lawrence Berkeley National Laboratory and the U.S. Dept. of Energy in May 2019 for their exemplary work to save energy using EMIS.



HPE's FDD diagnostic dashboard helps filter and prioritize issues

Treating Detected Faults as Projects

While FDD has been an essential tool for ISS, there is still a need for an experienced engineer or controls technician to determine what action to take for each fault. ISS has a centralized FDD expert on staff that works with designated site leads at each facility through the first year of FDD implementation. In that year, the team implements the largest energy savings opportunities and the on-site staff receive hands-on training to lead the FDD process at their site.

HPE's FDD strategy includes obtaining funding for capital projects required for resolving major faults and implementing additional energy conservation measures. In most cases, the largest energy-saving faults are put together as projects with a payback under 2 years. A project with a good ROI allows for contractors to be hired to help busy site staff implement the solution.

One example project implemented at multiple HPE sites involved getting water-side economizers to correctly operate to take advantage of free cooling. For many years these water-side economizers had been in place, but operations had been so challenging that the equipment wasn't used. The FDD software put an energy cost on this opportunity (based on actual chiller data), and the analytics gave operators more confidence that they could maintain the economizers if they were restored to operation. This convinced the teams that it was worth the effort to get the systems up and running. Some of the chillers had an estimated $35,000/year in energy savings.

> ***Without FDD, it's hard to keep track of all the systems and it's typical to just let things run. Now we see the problems immediately, the site leads make changes, and we save a lot of energy.***
> *- Kurt Kirchner, Sr. Engineering Technician*

Building Operator Buy-in

While operators may be skeptical initially, through experience, the operations teams found that being able to proactively manage operations with FDD was worth the time investment. The site leads see FDD not only as a useful tool in their toolkit but also a potential career advantage as the buildings industry begins to focus more on analytics.

The Smart Energy Analytics Campaign is a public-private sector partnership program focused on commercially available Energy Management and Information Systems (EMIS) and monitoring-based commissioning practices. The campaign couples technical assistance with qualitative and quantitative data collection to inform research, development, and field study priorities. Partnering participants are encouraged to share their progress and may receive national recognition for implementations that demonstrate exemplary practices.