

Building Analytics Success Story

Salt Lake City Public Safety Building

Salt Lake City's Public Safety Building is a prime example of how building analytics can be essential in turning a high performance building design into reality. Opening in 2013, the building was designed to achieve net-zero energy, with annual renewable energy generation equivalent to annual energy consumption. As with any complex high performance building design, it takes time and effort to reach peak performance – and that's where building analytics was essential.

After a year of operation, the Public Safety Building wasn't performing to its maximum capability. Systems were operating to original design specifications but actual electric and natural gas usage was above energy model predictions developed during design. To reach net-zero performance, the Salt Lake City energy team initiated a monitoring-based commissioning (MBCx) project at the Public Safety Building in 2015. MBCx combines a detailed operational assessment with building analytics to identify and fix deficiencies, and then to ensure that energy savings persist.

What is FDD?

Fault Detection and Diagnostics (FDD) tools are software that identify building systems performing sub-optimally. FDD is one type of tool known as energy management and information systems (EMIS).

Salt Lake City's MBCx project utilized fault detection & diagnostics (FDD) software to continuously analyze HVAC system performance. Through FDD and additional analysis of the control systems, the following issues were identified and resolved:

- Simultaneous heating and cooling
- Over-ventilation of occupied spaces
- Air handlers operating during unoccupied periods



We were running the air handler as hard as it can go and our gas usage was high – our FDD software helped us find and fix the problems.

- Cameron Scott, Energy/Utilities Coordinator

Optimizing the control of the air handlers, chilled beams, and radiant floors contributed to an overall 57% reduction in natural gas consumption from the MBCx project.

Quick Facts

Location: Salt Lake City, Utah

Building type: Office and data center

Gross floor area: 175,000 square feet

Energy Star Score: 100

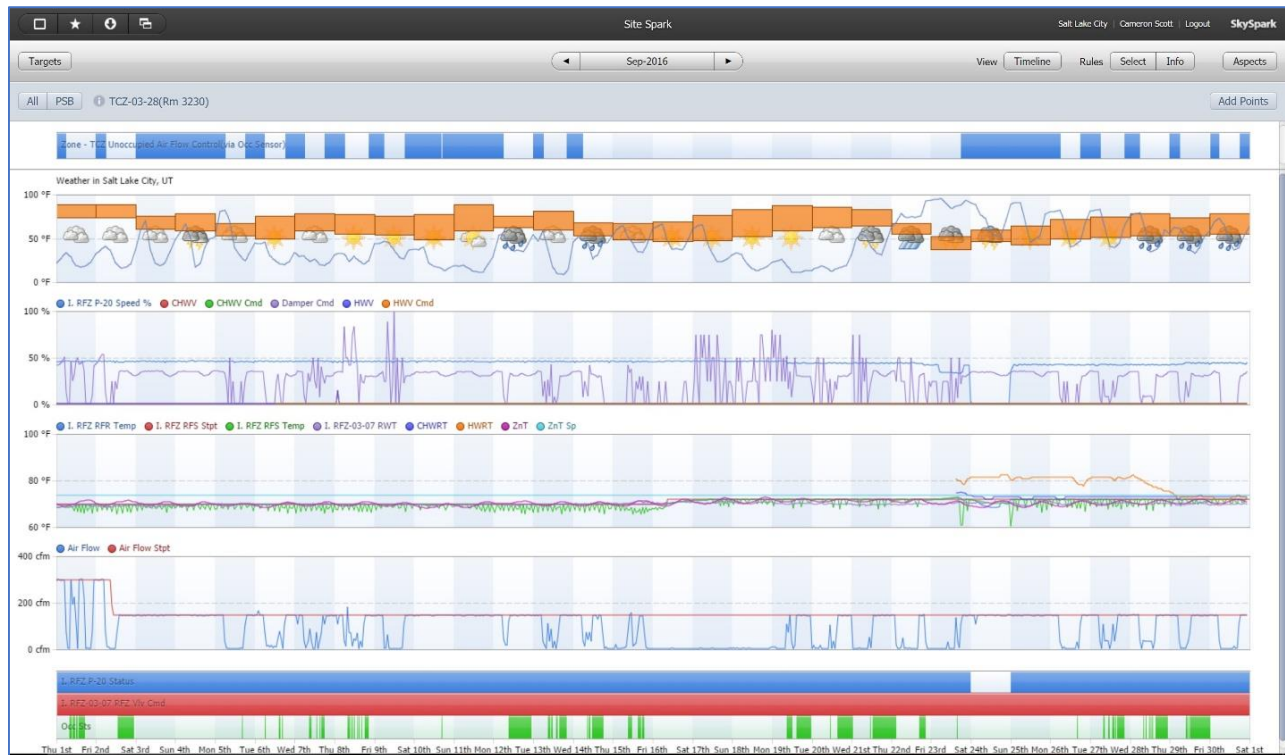
Rating: LEED Platinum; Carbon net-zero

EMIS Tools: SkySpark FDD software, Luminetric monthly bill tracking software

Energy Savings: 2016 saw 35% reduction in gas and electric combined, compared to a 2015 baseline

Smart Energy Analytics Campaign: Recognition for Energy Performance

Salt Lake City received national recognition from the U.S. Department of Energy's Smart Energy Analytics Campaign in 2017, acknowledging their exemplary work to save energy through the use of EMIS.



Salt Lake City's FDD system continuously monitors all building HVAC equipment (Source: Salt Lake City)

Optimize & Maintain

The Public Safety Building MBCx project saw overall energy savings of 35%, but that's not the end of the story. Salt Lake City is continuing its use of FDD to ensure that performance is maintained or improved over time. FDD software can alert facility staff immediately if performance drops over time, for example due to:

- Sensor or equipment failure
- Equipment controls being over-riden
- Changes in building occupancy patterns

In addition, the FDD software programming can be refined to cover more systems or to hone control settings further.

The Bottom Line

Salt Lake City's MBCx efforts have resulted in the Public Safety Building achieving the maximum Energy Star

rating of 100. While FDD software is monitoring the performance of individual building systems, Salt Lake City is also tracking whole building energy consumption with monthly utility bill tracking software. The combination of FDD and monthly energy use tracking helps ensure that they are meeting and maintaining their overall building performance targets. Salt Lake City has shown that their FDD investment paid back within one and a half years.

Due to the complexity of the building, it is necessary to have software analyzing the data to ensure our systems are working well
 - Cameron Scott, Energy/Utilities Coordinator

Following the success of the Public Safety Building, Salt Lake City's energy team plans to expand its MBCx process to more buildings across the city.

The Smart Energy Analytics Campaign is led by the U.S. Department of Energy to support commercial building owners in adopting energy management and information systems (EMIS). The program provides technical assistance, recognition opportunities, and a chance to network with industry-leading peers. Whether you have an established EMIS or are in the early stage of considering EMIS, the Smart Energy Analytics Campaign will support your move to the next level. [Learn more at smart-energy-analytics.org](http://smart-energy-analytics.org)