

# Building Analytics Success Story

## MGM Resorts International

With over 80 million square feet of properties that have undergone extensive renovations over the years, pursuing aggressive energy savings goals is a highly complex undertaking for MGM Resorts International, the Las Vegas-based hospitality company. A variety of building automation systems (BAS) and 24/7 nature of the business creates additional challenges in gathering the necessary data for improving and maintaining operations. With a smart approach to building analytics, MGM Resorts is addressing those challenges and reaping significant savings.

MGM Resorts has achieved significant operational energy efficiencies through retrocommissioning (RCx) projects, but encountered two main challenges:

- Operational improvements can degrade over time
- RCx, built on a manual investigation process, is hard to scale across a large portfolio quickly

In 2015, MGM Resorts decided to augment their RCx efforts by installing fault detection and diagnostic (FDD) software. Nine properties are now equipped with FDD software, covering 39 million square feet of floorspace, and MGM Resorts is seeing a reduction in annual energy costs from the combination of RCx and FDD software.

### What is FDD?

Fault Detection and Diagnostic (FDD) software identifies building systems with suboptimal performance. FDD is a type of energy management and information system (EMIS) that analyzes BAS data.

Beyond the significant energy waste reduction, the addition of analytics has changed the organization's energy management culture, and allows for accurate, actionable reporting at all levels of the organization.



*When issues arise involving major HVAC equipment, the first call is to the EMIS team to diagnose in the EMIS system. This process helps maintain guest comfort, decrease avoidable service calls and ultimately unnecessary equipment replacement.*

*- Chris Magee, Vice President of Sustainable Facilities, MGM Resorts International*

### Quick Facts

**Location:** Las Vegas, Nevada

**Building type:** Hotels, convention centers, entertainment/gaming/dining spaces, theaters

**Gross floor area covered by FDD:** 39 million square feet

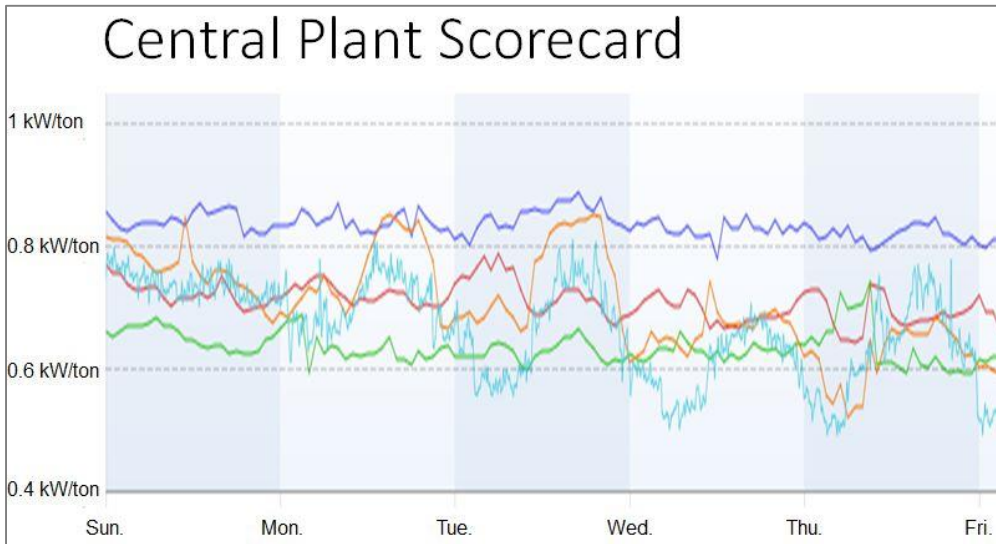
**Total buildings with FDD:** 9

**EMIS Tool:** SkySpark by SkyFoundry

**EMIS service provider:** Altura Associates

### Smart Energy Analytics Campaign: Recognition for Largest Portfolio Using EMIS

MGM Resorts International 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.



*Once we had the data available, it was much easier for senior leaders to support our proposition to further expand our FDD installation across the company.*  
 - Chris Magee, Vice President of Sustainable Facilities, MGM Resorts International

MGM Resorts uses EMIS to continuously monitor central plant efficiency (Source: MGM Resorts)

### Evolution of FDD implementation

MGM Resorts' approach to implementing FDD was to start in the central plant and rigorously focus on a small number of opportunities, such as:

- Detecting system controls left in override
- Benchmarking chiller efficiency (kW/ton)
- Optimizing water-side economizer operation

With the support of third-party service provider Altura Associates, MGM Resorts optimized these core fault detection rules and then expanded application out across multiple sites. Building from a consistent set of core FDD rules MGM adjusts for specific conditions at different sites and develops additional rules based on individual property managers' highest priority operational needs.

After addressing key issues in the central plants MGM Resorts has gradually expanded the scope of FDD to the air handlers in each building. FDD expansion is based on pulling data from the existing BAS, without the need for additional metering hardware.

### Management approach

FDD software alone does not optimize building systems, it relies on effective management to respond to the analytics. MGM Resorts has spent considerable time to ensure that their FDD software was receiving accurate systems data, and that its reports were actionable and relevant.

The EMIS team tracks performance across the portfolio and is the first call when any operational problems are experienced at individual buildings. This proactive approach has provided additional cost savings from avoided service calls and unnecessary equipment replacement. Most of the FDD rules development is handled by Altura, while the corporate energy management team and facility staff regularly access the system to view status and reports.

MGM Resorts' continued investment in FDD is justified by the ability to ensure that savings from RCx and retrofit projects persist and by the ability to support improved decision-making at each property regarding on-going operational challenges and future project planning.

**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)