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NS2024
APRIL 15 - 17 | ANAHEIM, CA

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Niagara in Data Centers Plus Enterprise-Scale N4 Migration Success

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Introductions

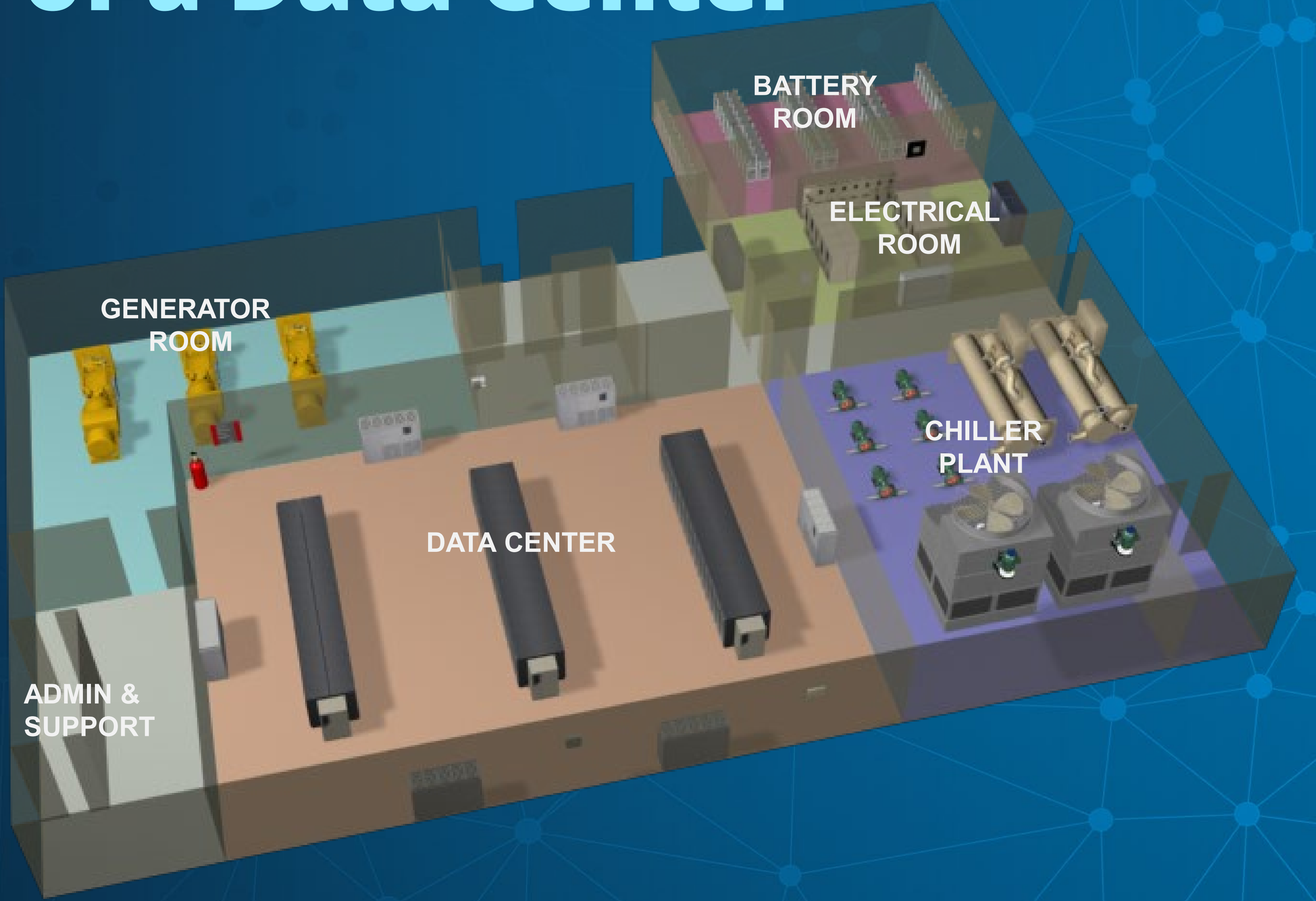
Mitch Reed
Division Manager
Conti Controls

Richard Warner, P.E.
Director, Solutions Architecture
Albireo Energy

Agenda

- Quick Overview
- Data Center Challenges / Opportunities
- Solution Examples / Discussion

Anatomy of a Data Center



Facility Challenges / Opportunities

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- Space Management
- Power / Energy
- Cooling / Heat Rejection
- Security / Monitoring
- Operations / Maintenance

Solution Example

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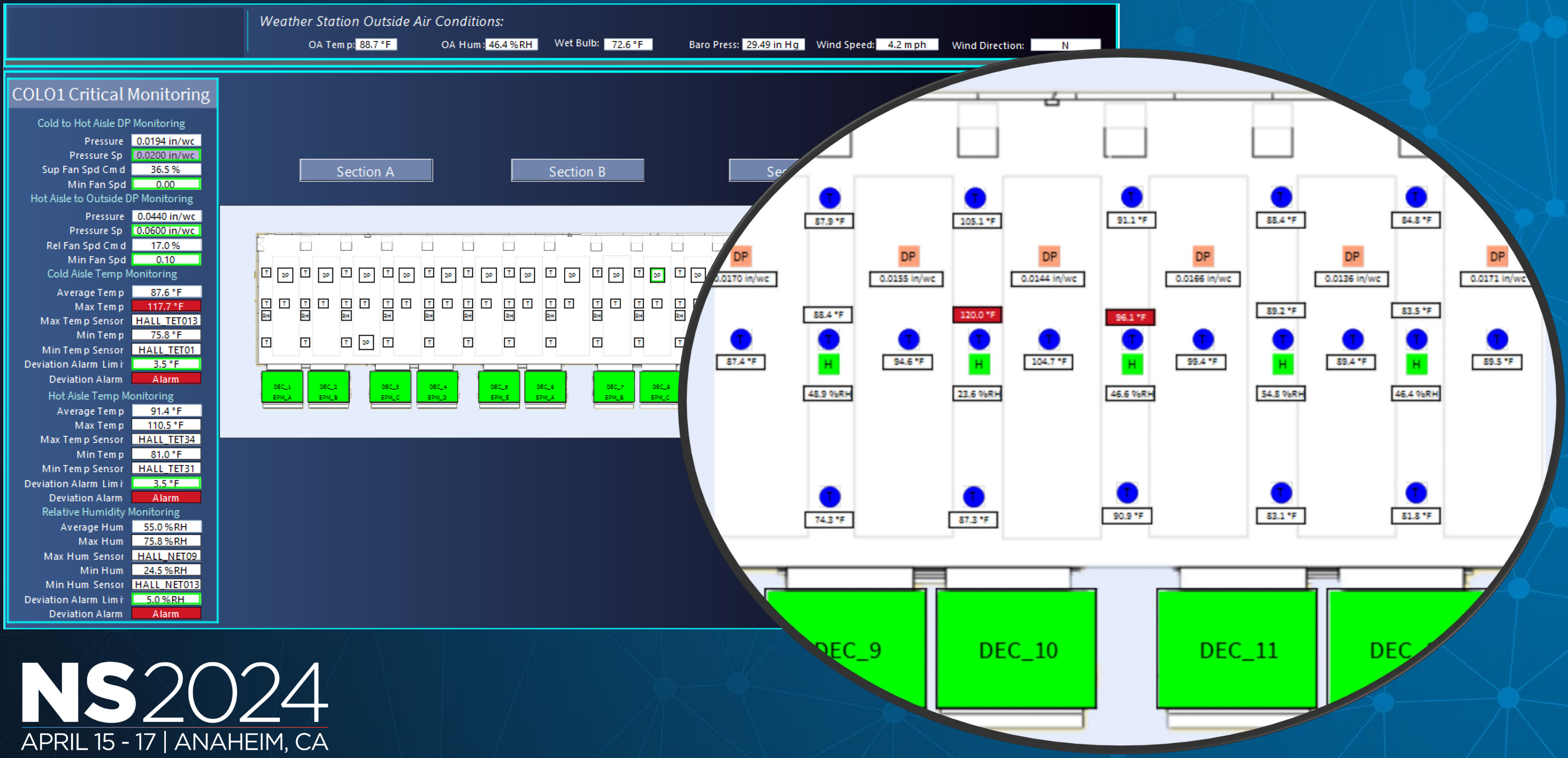

Rack Pressure Control – Cold To Hot Aisle ΔP

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Central Controller Control Loop Descriptions

DATA CENTER SERVER RACK PRESSURE CONTROL (COLD TO HOT AISLE DP)

Supply fan volume is controlled on a per data center basis.

Differential pressure setpoint: 0.02" wc

There are twenty (20) cold aisle to hot aisle differential pressure sensors in the data center. The central controller controls the cold aisle to hot aisle differential pressure automatically by sending an output signal (supply fan volume signal) to all the DEC unit controllers over the BAS network while the units are in auto.

The operator can select to use the average or any single sensor for control. The operator shall not be allowed to select an invalid sensor for control.

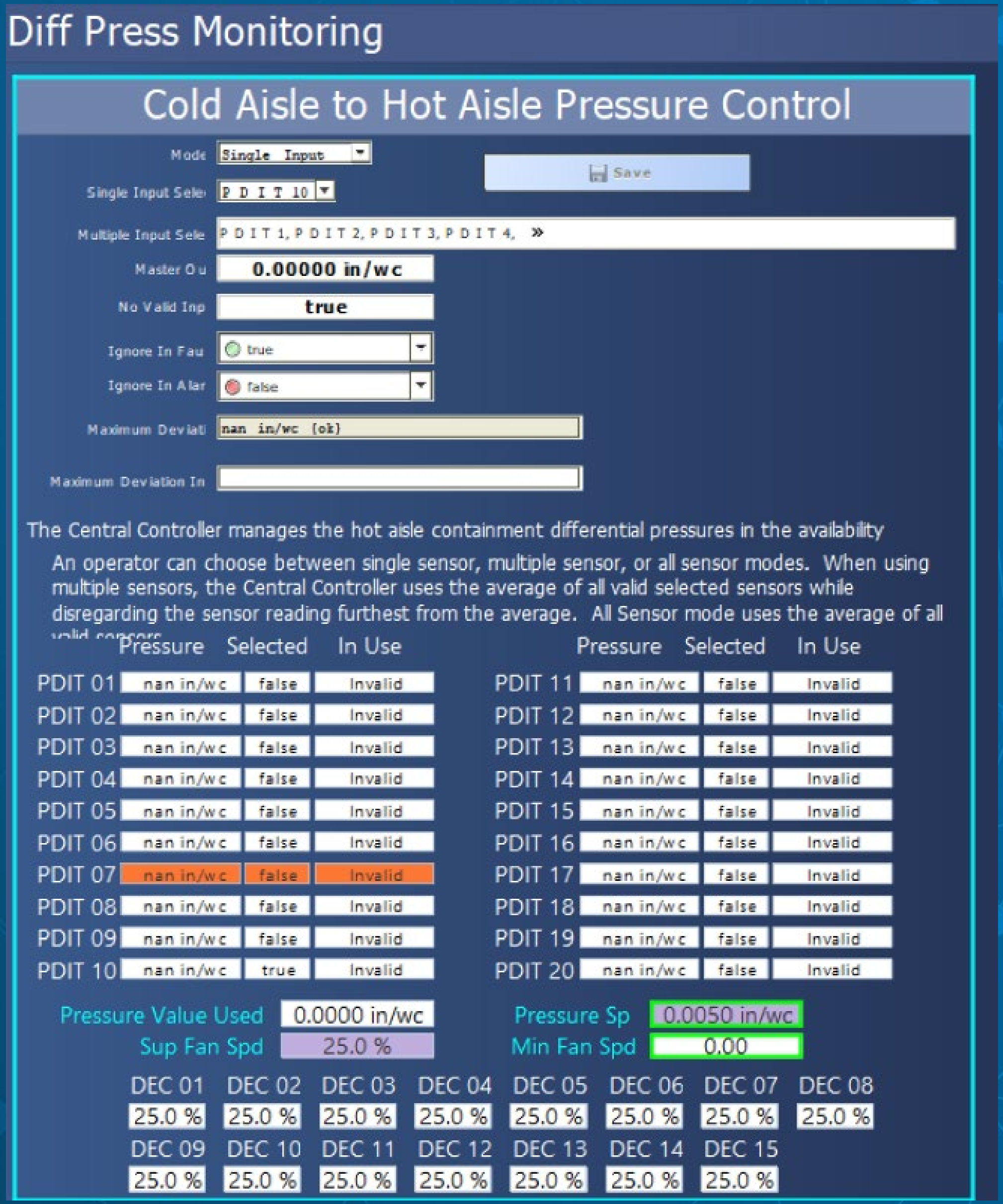
In single sensor select mode, if the selected DP sensor fails or goes out of range, then the central controller shall control to the lower of the remaining DP sensors. As subsequent DP sensors fail or go out of range, then the central controller shall control to the lowers of the available sensors.

If all DP sensors fail or go out of range, the central controller shall maintain the air volume at the last known value.

In average mode, the operator can select five (5) of the sensors for control (default initial sensors selected will be 2, 6, 10, 14, and 18) the controller uses the average of the four (4) pressure readings closest in value and excludes the one value the farthest from the group. This average value shall be filtered so that the value does not constantly change.

The excluded signal is noted at the BAS. If the excluded sensor value exceeds (from average) the deviation alarm setpoint 10 Pa, a deviation alarm is triggered. In averaging mode, if one (1) of the selected DP sensor fails or goes out of range, then the central controller shall use the remaining four (4) DP sensors for averaging calculation. If multiple DP sensors fail or go out of range, then the central controller shall use the remaining DP sensors for control. If all five (5) DP sensors fail or go out of range, the central controller shall maintain the air volume at its last know value. Once all the selected pressure sensor values have returned to a valid reading the central controller shall release the signal to the DEC's one unit at a time as described in the loss of communications section.

In averaging mode, should one (1) of the selected sensors fail, the operator can select one of the remaining unused sensors to be utilized in averaging mode and the loop calculations will continue as described above. All failed or out of range sensors shall be indicated as such in the BAS graphics.



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Rolling Average Block – Vykon Pro

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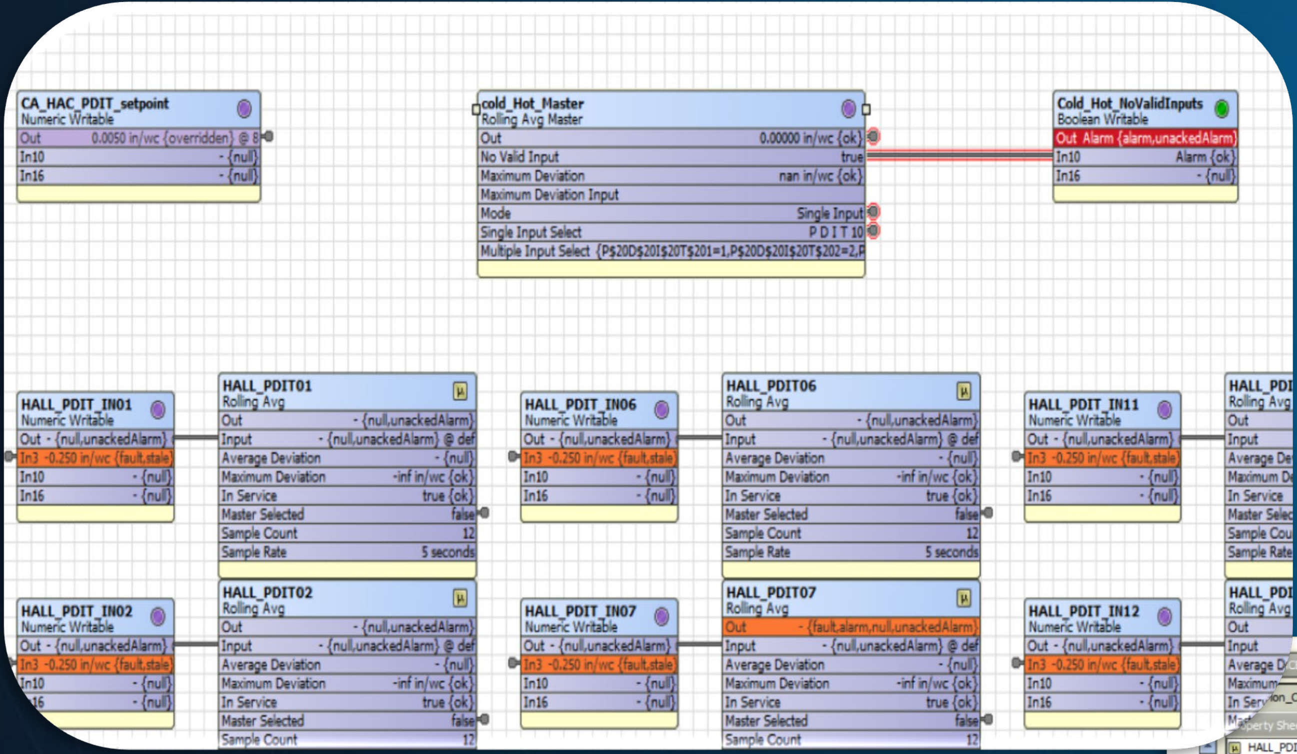

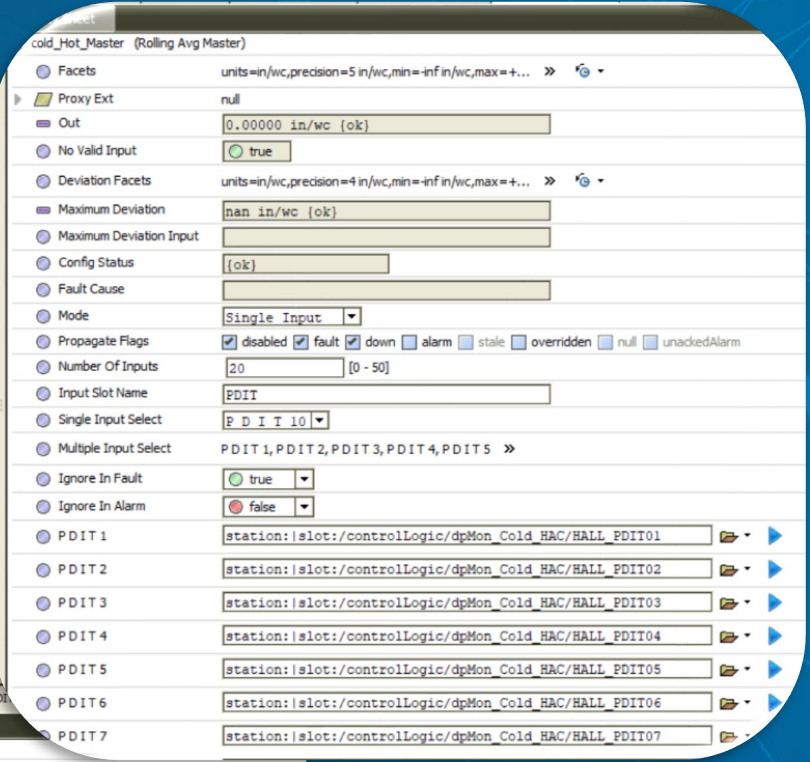

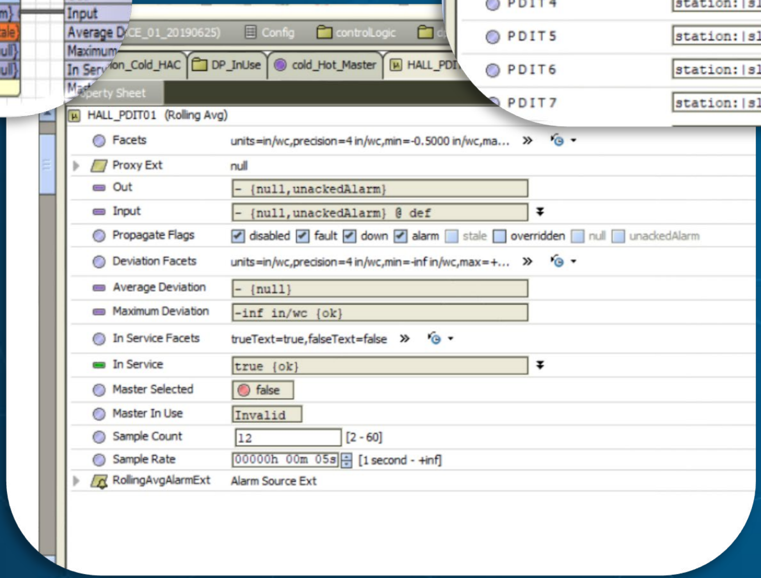

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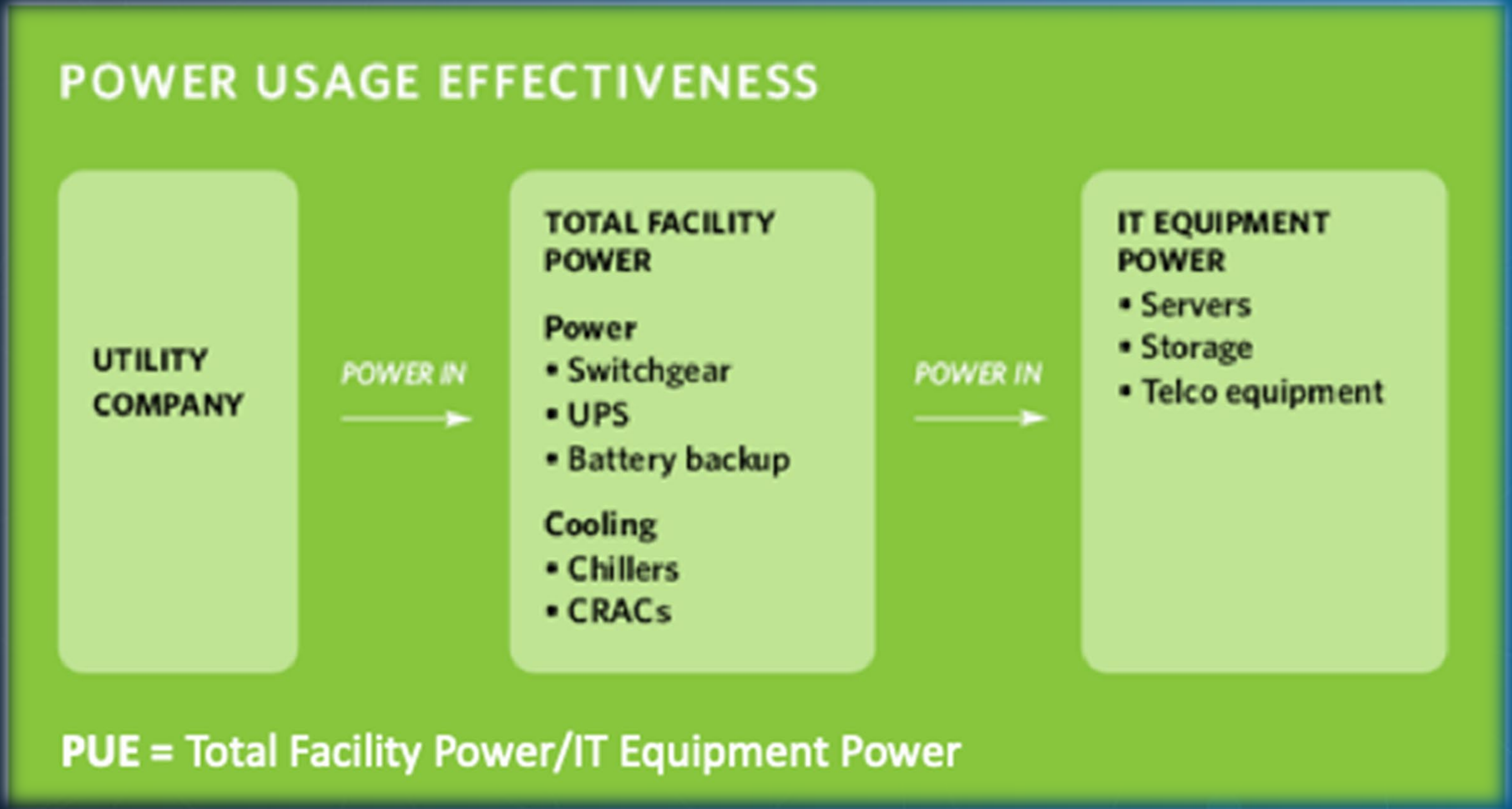
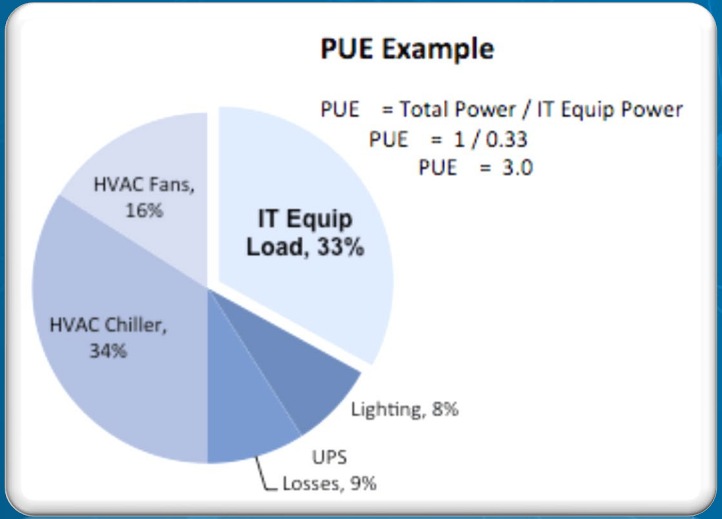
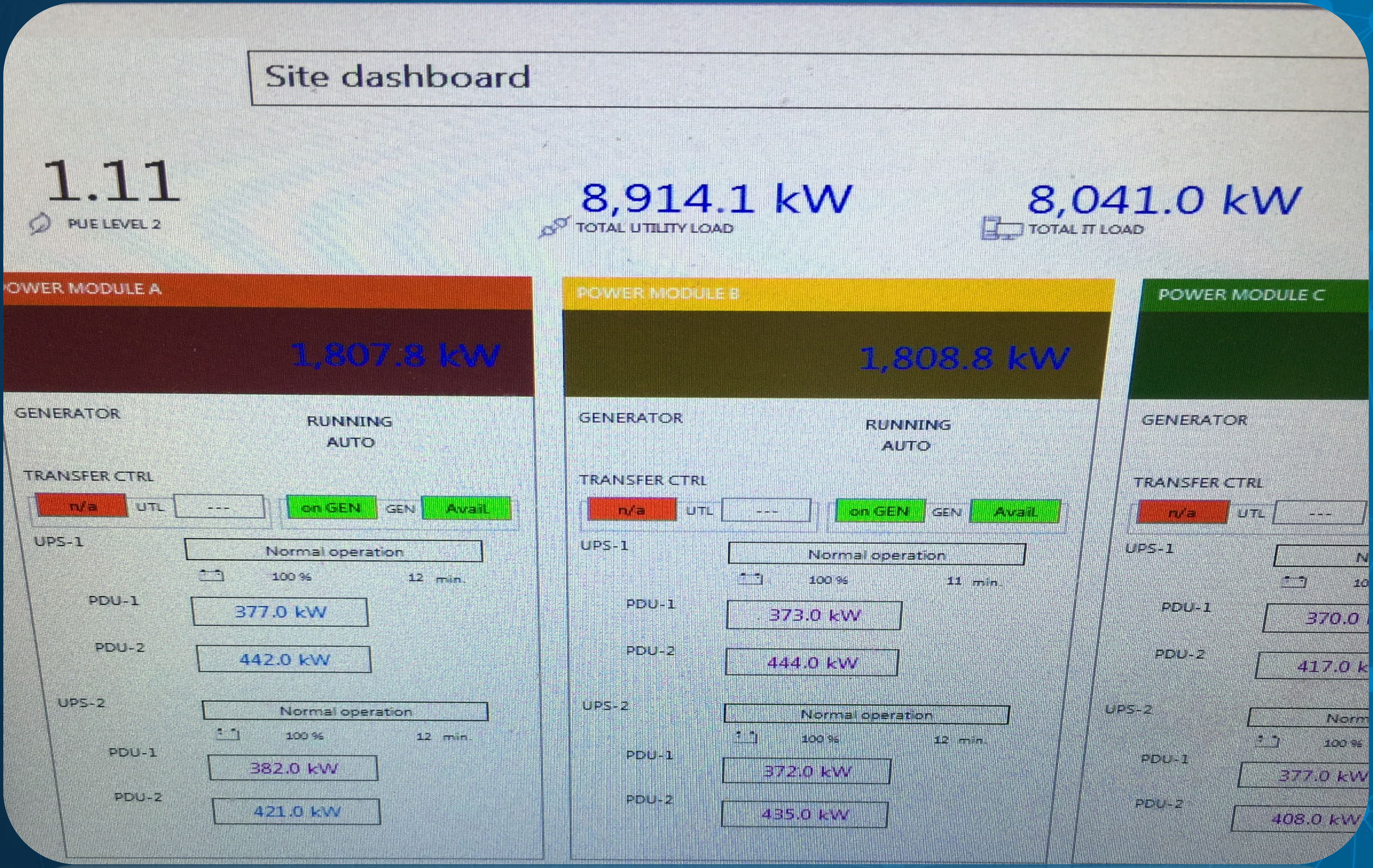
Power Utilization Effectiveness





Solution Example



Migration Challenges / Opportunities

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- Standardization
- Planning Downtime
- Mitigating Data Loss
- Improving Data Modeling
- Optimizing User Experience

Solution Example

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70's-Era Big-City Plaza Transforms from Inside Out With N4 Upgrade

Conti

Owners and operators of large metropolitan buildings have many reasons to keep their building automation and controls infrastructure up to date. When you are managing a portfolio with assets that are typically 50 to 100 years old, deploying the latest tech is one thing you can do to modernize. Buildings in the Midwest USA, for example, are estimated to be responsible for nearly two-thirds of a city's greenhouse gas emissions, and building owners there have been aggressive in their use of technology to cut carbon use, ease demands on the local power grid and save money. Now, in the 2020s, Big-metro property owners are pioneering solutions to additional challenges like:

- Encouraging occupants to return to the city and to offices after the Covid-19 pandemic.
- 'Electrifying' buildings — getting them zero-carbon and electric-car ready by incorporating more battery storage and renewable energy infrastructure.

Building controls and data strategy are core to the success of all this, which has led to strong, trust-based relationships between large building owners and those MEP (Mechanical/Electrical/Plumbing) contractors that have risen to the call to expand their practices into OT networking, open protocol building automation and digitalization. Conti Corporation is one such multi-trade firm who is working to deliver on on-going contracts for IT/OT services to large-building owners in the Midwest.

CHALLENGE

Mitchell Reed, a Division Manager with Conti, had this to say about a retrofit project involving a skyscraper property and adjoining buildings in a downtown plaza: "The customer asked us to standardize their Building Management System (BMS) deployment across their campus portfolio, allowing the operators to have a single pane of consistent glass to operate the facilities. The overarching challenge for this project was the sheer size of the integration. We needed to accommodate data from all the equipment and devices serving more than 50 floors of diverse space utilization — including open office space, restaurants, and plant & operations."

This Conti project involved integration to Siemens, Honeywell, Distech, Trane, Circon and Johnson Controls brands, along with a migration from

"50+ floors, 60,000+ points, 6 different protocols, and a multitude of control lines. We need to put this jigsaw together in a way that is unified and useful to building operators. Harnessing the Niagara Framework® has allowed us to simplify the complexities of building automation."

Mitchell Reed
Division Manager
Conti Corporation

FAST FACTS

Project Type: Controls Retrofit of Class-A Office Complex

Property: Three buildings in a city plaza, the tallest having 25 floors and total structural height of 114.0 m (374 ft).

Project Area: 3,000,000+ square feet

Project Scope: Services under Niagara management include HVAC, Energy Metering, Steam Monitoring, Gas Detection and Envelope Pressurization.

Key Technologies: Niagara

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Solution Example

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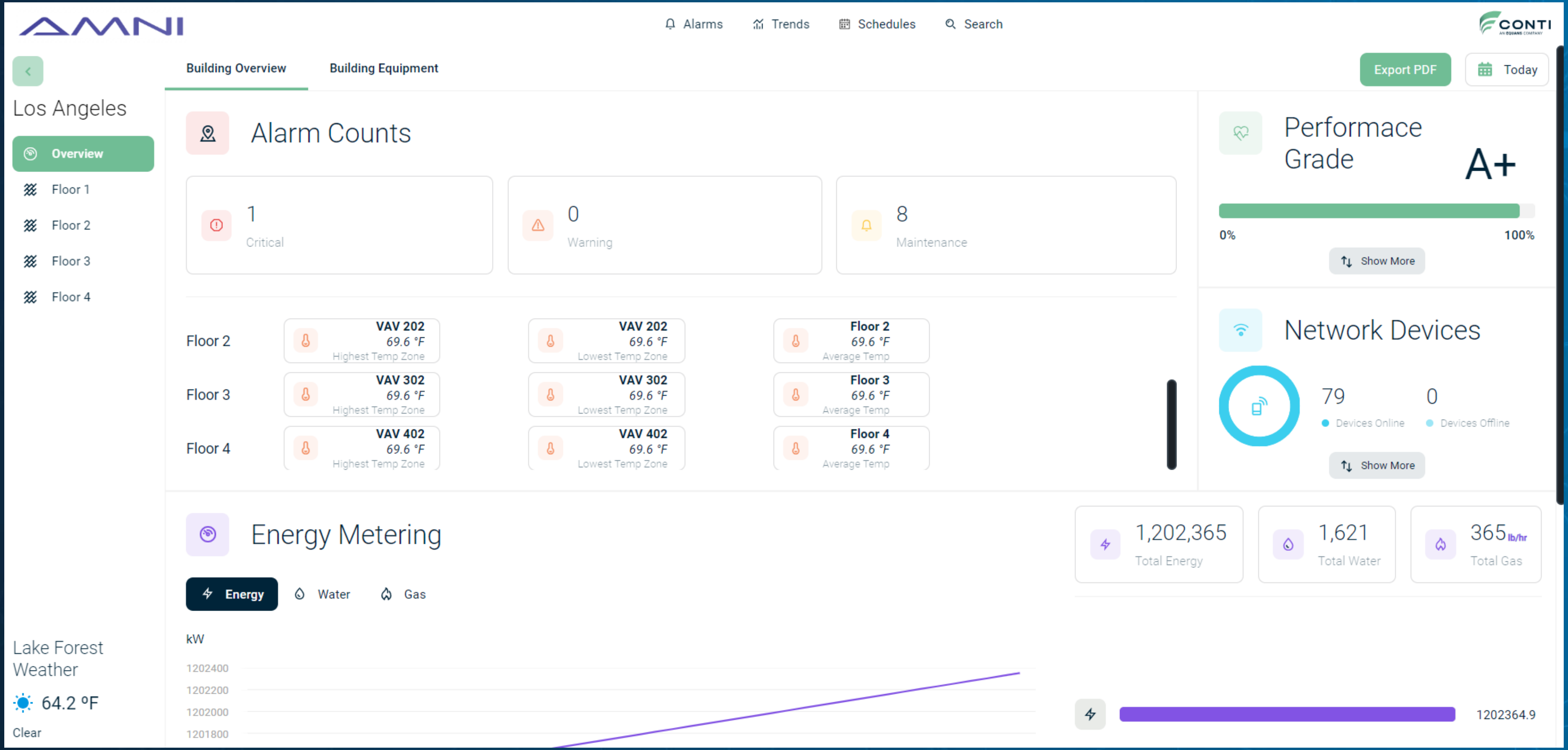

Thank You!

Mitch and Rick

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