OSIsoft Super Regional 2018

Fairmont Washington D.C. - Georgetown
August 20-22, 2018

How Corralling Operational Technology in PI Improved Operational Awareness at UMD

Don Hill, UMCP, Assistant Director, Engineering and Energy Facilities Performance
Dave Shaughnessy, UMCP, Assistant Director, Utilities
Kelsey Bobeck, DSA Inc, OSIsoft Implementation Lead

August 21st, 2018

© Copyright 2018 OSIsoft, LLC

Agenda

- About the University of Maryland, College Park (UMCP)
- Our Use Cases: Challenges, Solutions, and Results
  - Inconsistent data access
  - Delayed outage response
  - No distribution system awareness
  - Over-conditioning of classrooms
- What's Next

© Copyright 2018 OSIsoft, LLC

University of Maryland, College Park (UMCP)

© Copyright 2018 OSIsoft, LLC

Campus Energy Production

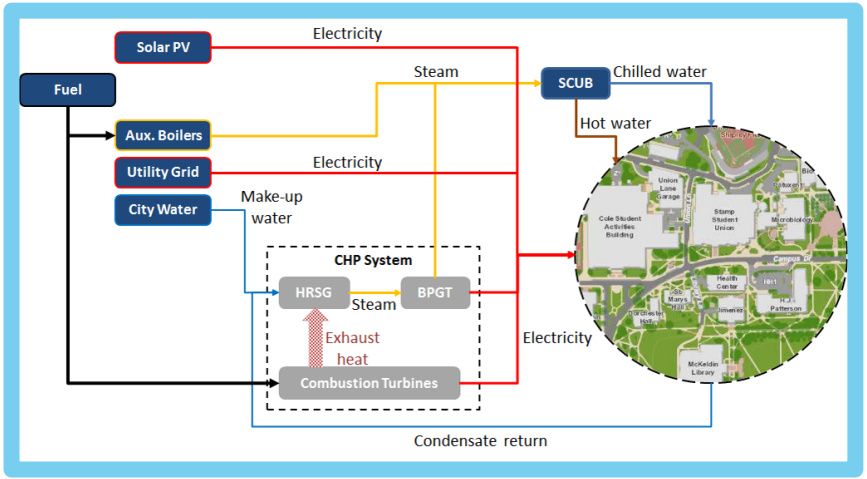
- Combined Steam and Power Plant
  - 27 MW of electricity
  - 280,000 lbs. of 125 psi steam per hour
- 32,000 tons of Chilled Water generation at 15 plants

- 2.5 MW solar array

© Copyright 2018 OSIsoft, LLC

District Energy System

- 1,340 acre Main Campus
- Electric, Steam, Chilled Water
- 10 Electrical Feeder Loops
- 15 miles of underground steam and chilled water piping



© Copyright 2018 OSIsoft, LLC

Challenges for UMCP

Inconsistent Access to Data

No remote access to CHP plant data

Disparate campus monitoring systems

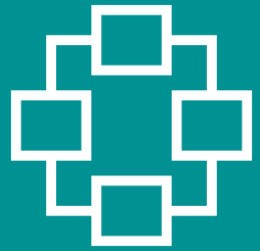
Delayed awareness of loss of data feed

Delayed Outage Response

Not aware of outage until customer calls CRC

No insight into extent of outage

Have to visit each building individually to know status



No Distribution System Awareness

Static CAD drawings

No insight into “hotspots”

Data access impractical or non-existent

Reduce Classroom Conditioning

Manual scheduling

Overuse of equipment

Unnecessary energy use

© Copyright 2018 OSIsoft, LLC

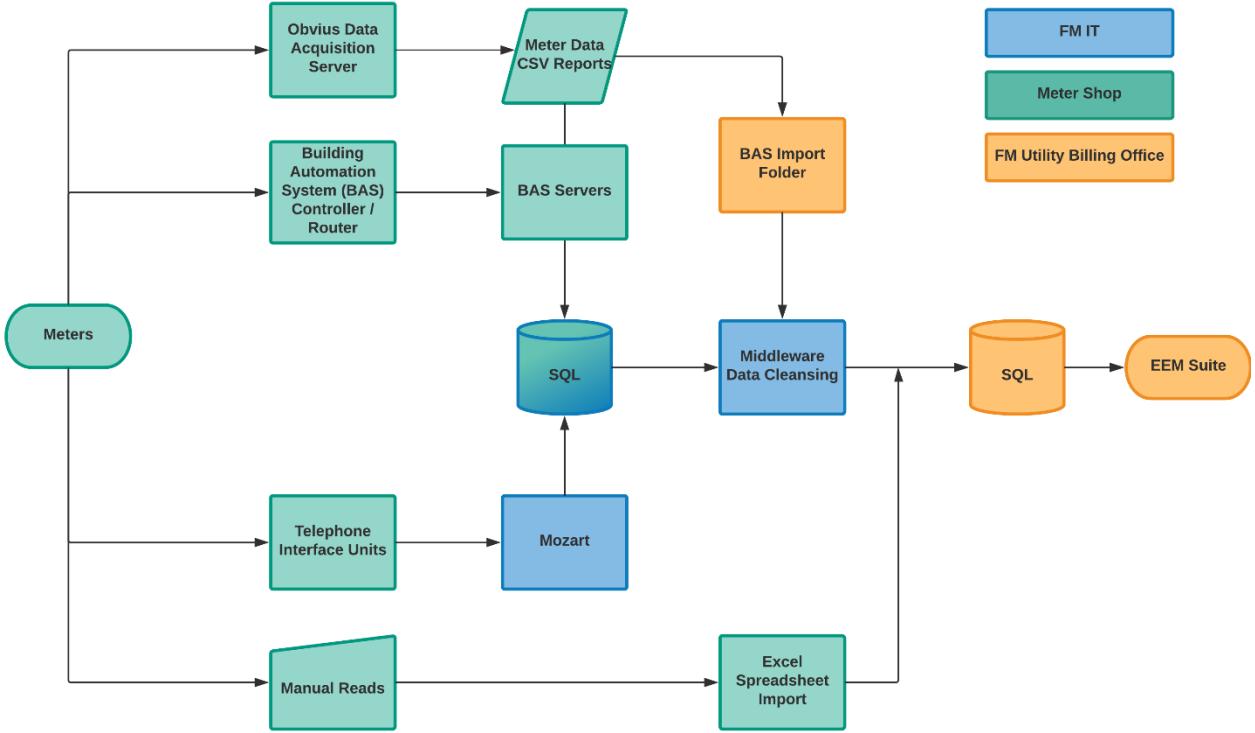
Challenge: Inconsistent Access to Data

Inconsistent Access to Data

No remote access to CHP plant data

Disparate campus monitoring systems

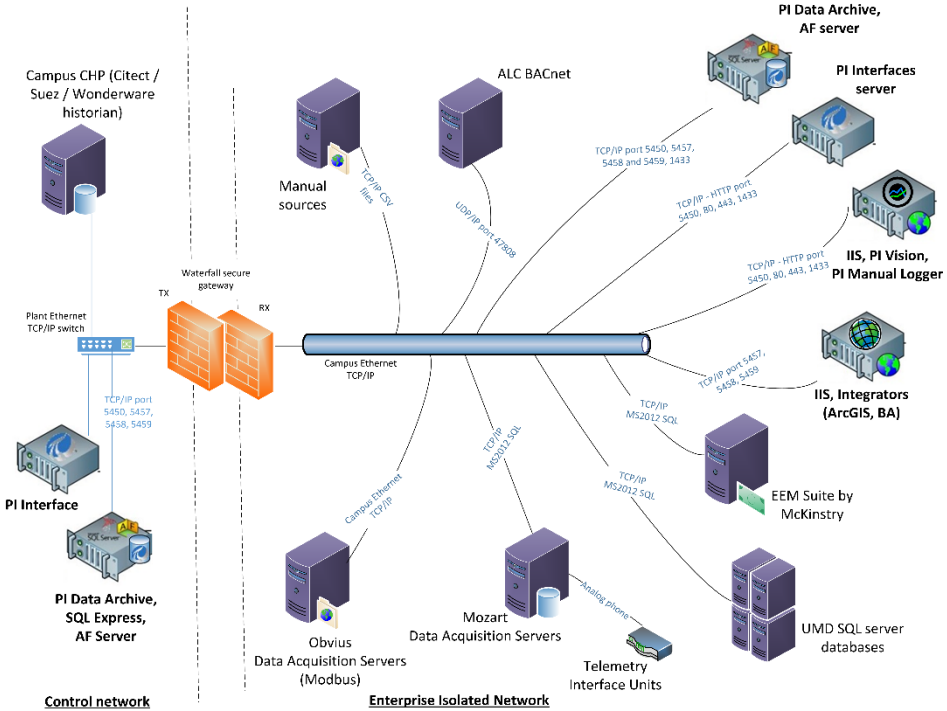
Delayed awareness of loss of data feed



© Copyright 2018 OSIsoft, LLC

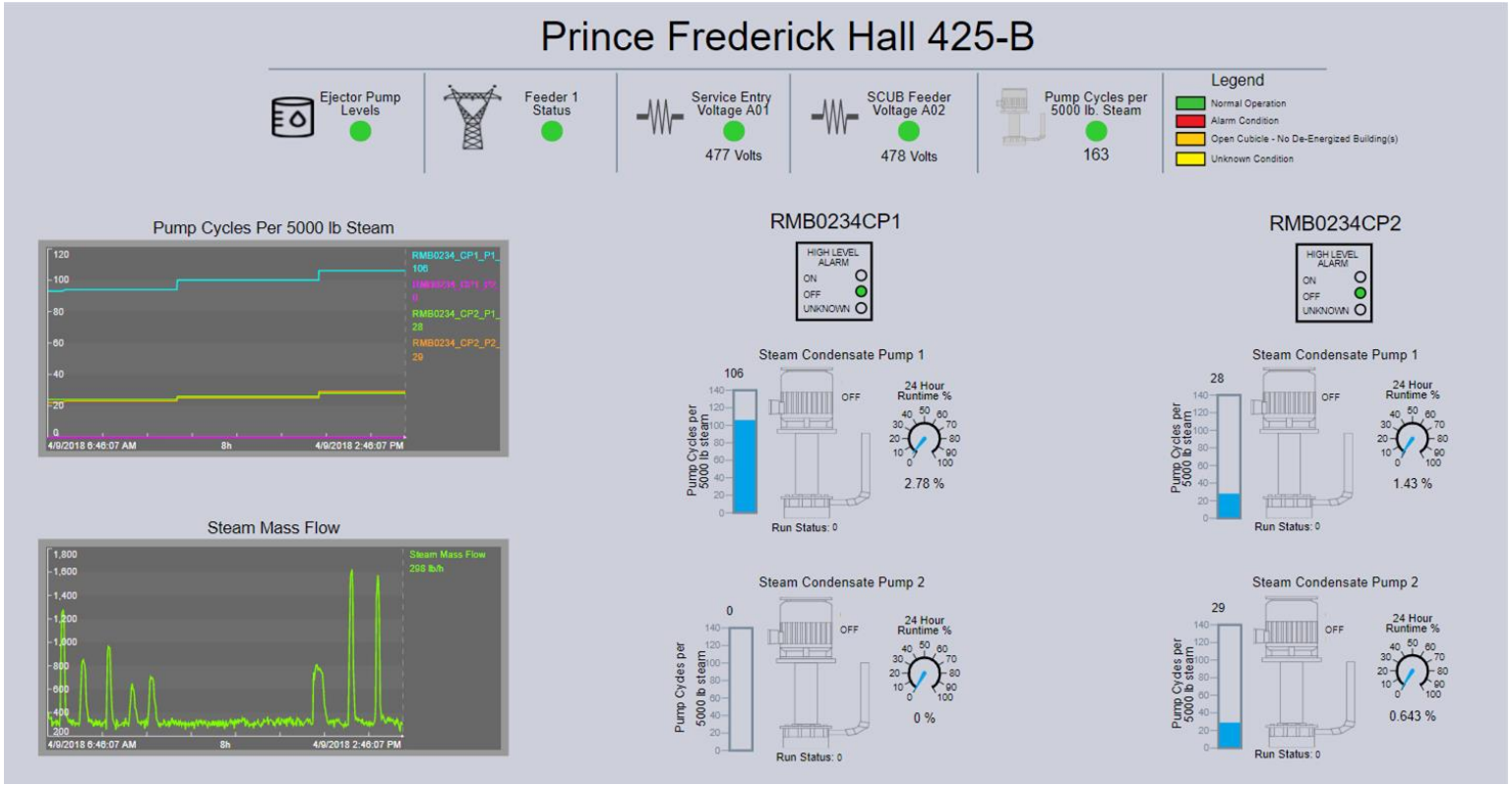
Solution: Secure, Centralized Data

- Waterfall Secure Gateway
- 5 different interfaces
- PI Manual Logger
- Daily tag reports



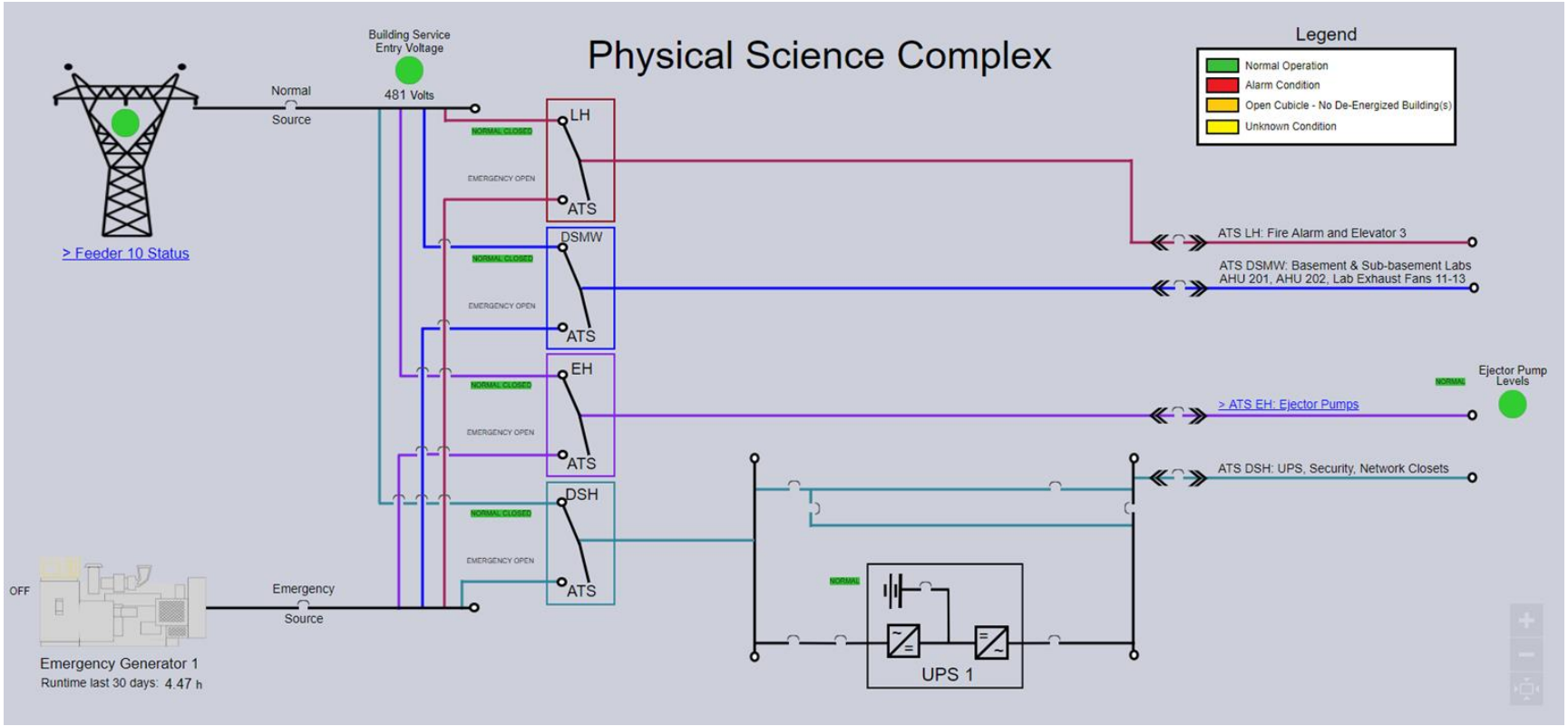
© Copyright 2018 OSIsoft, LLC

Result 1: Cost Avoidance through Unified Insight



Pump Overview Screen

Result 2: “Single Pane of Glass” Views



ATS Monitoring Screen

© Copyright 2018 OSIsoft, LLC

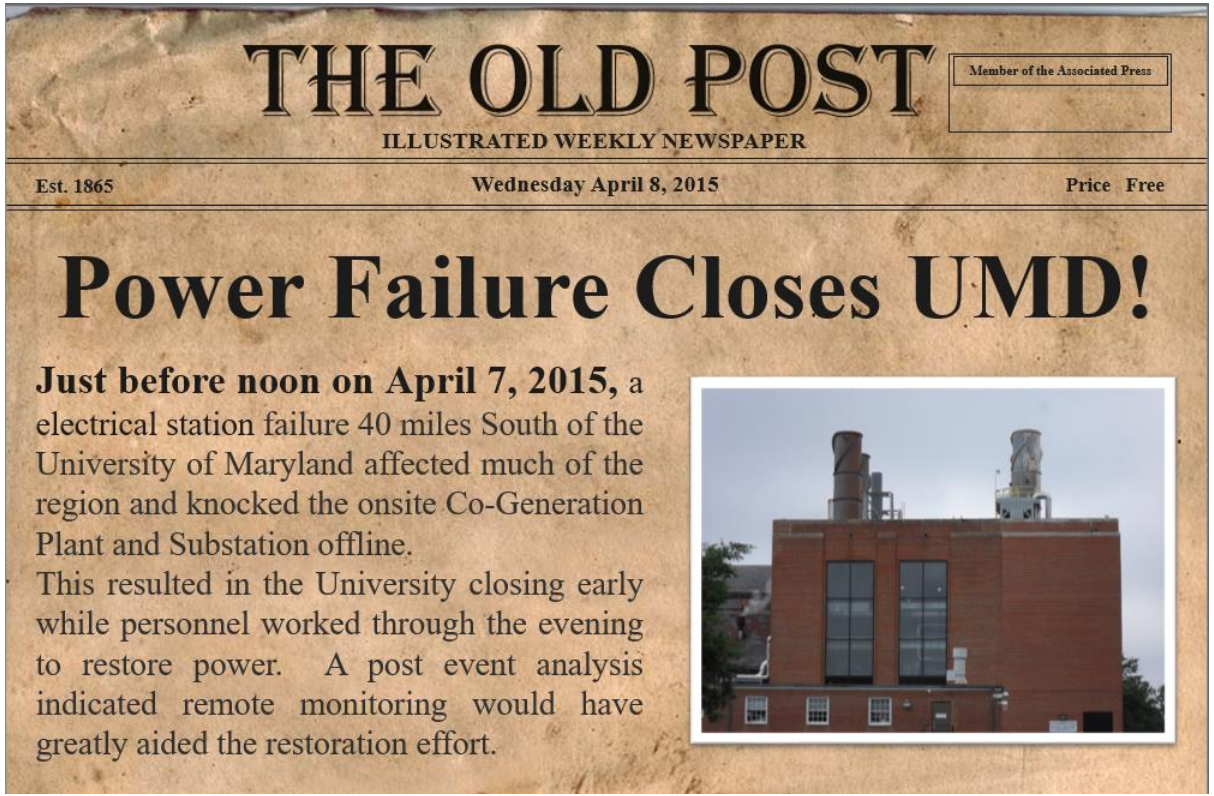
Challenge: Delayed Outage Response

Delayed Outage Response

Not aware of outage until customer calls CRC

No insight into extent of outage

Have to visit each building individually to know status



THE OLD POST

Member of the Associated Press

ILLUSTRATED WEEKLY NEWSPAPER

Est. 1865 Wednesday April 8, 2015 Price Free

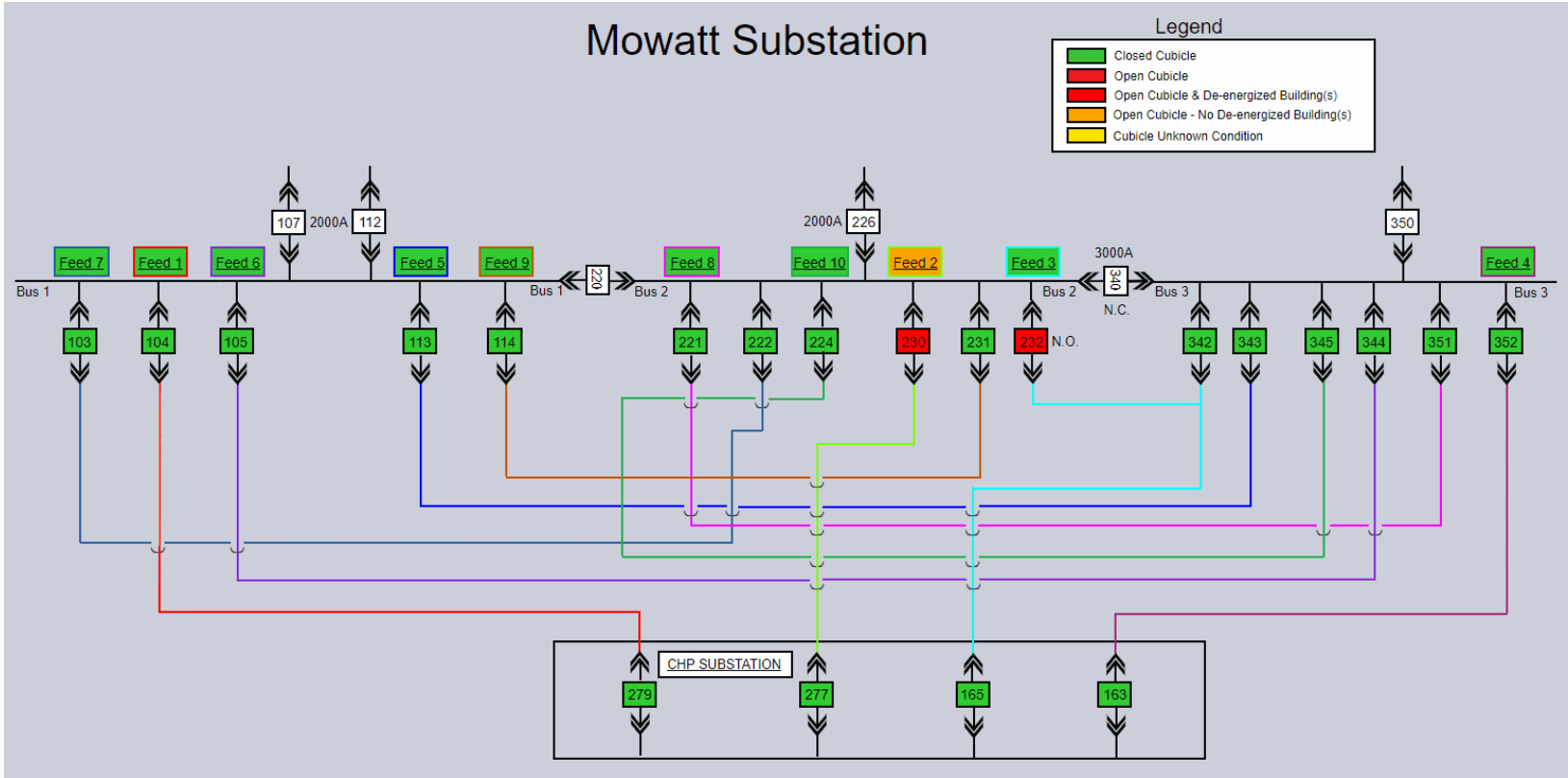
Power Failure Closes UMD!

Just before noon on April 7, 2015, a electrical station failure 40 miles South of the University of Maryland affected much of the region and knocked the onsite Co-Generation Plant and Substation offline.

This resulted in the University closing early while personnel worked through the evening to restore power. A post event analysis indicated remote monitoring would have greatly aided the restoration effort.

© Copyright 2018 OSIsoft, LLC

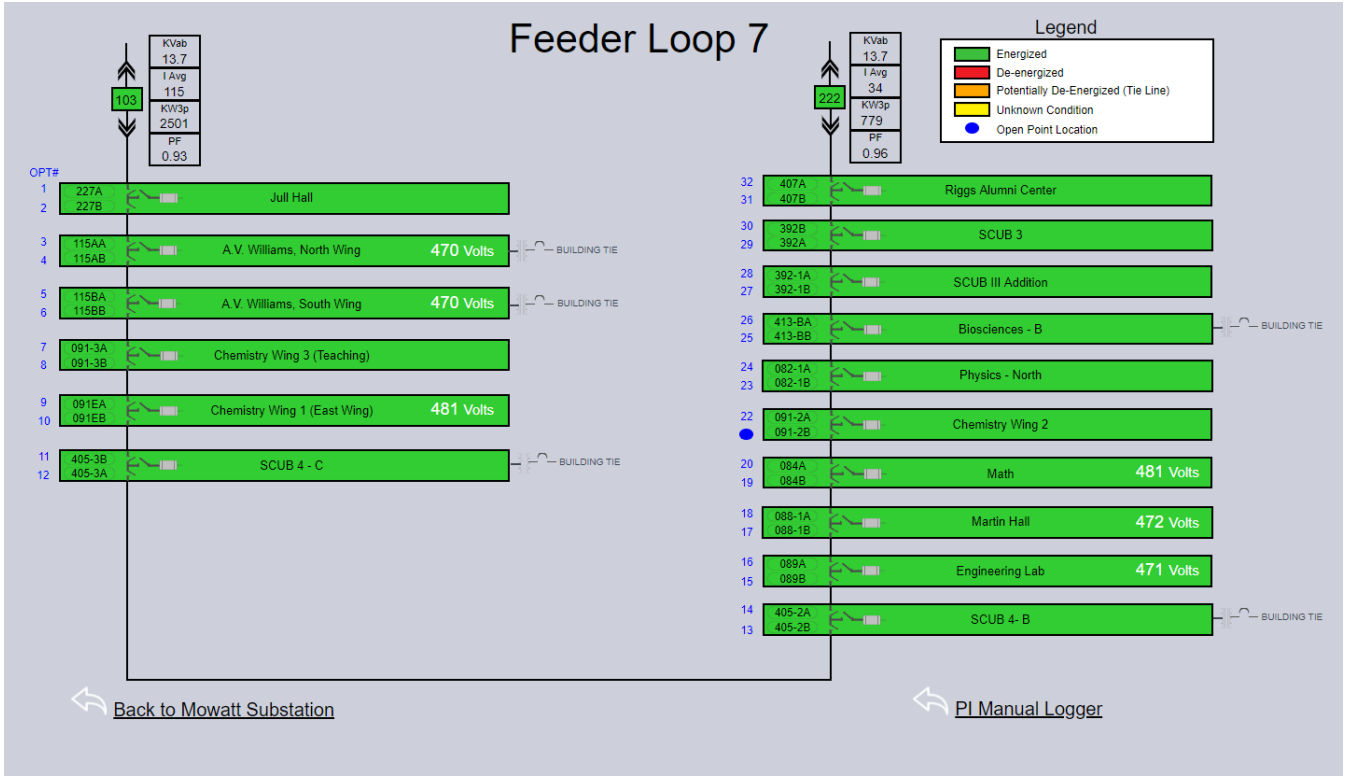
Result 1: Up to 90-minute Head Start

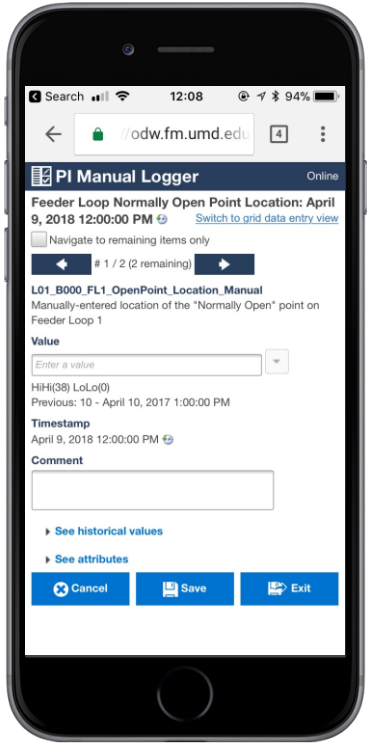


Feeder Loop Overview Screen

© Copyright 2018 OSIsoft, LLC

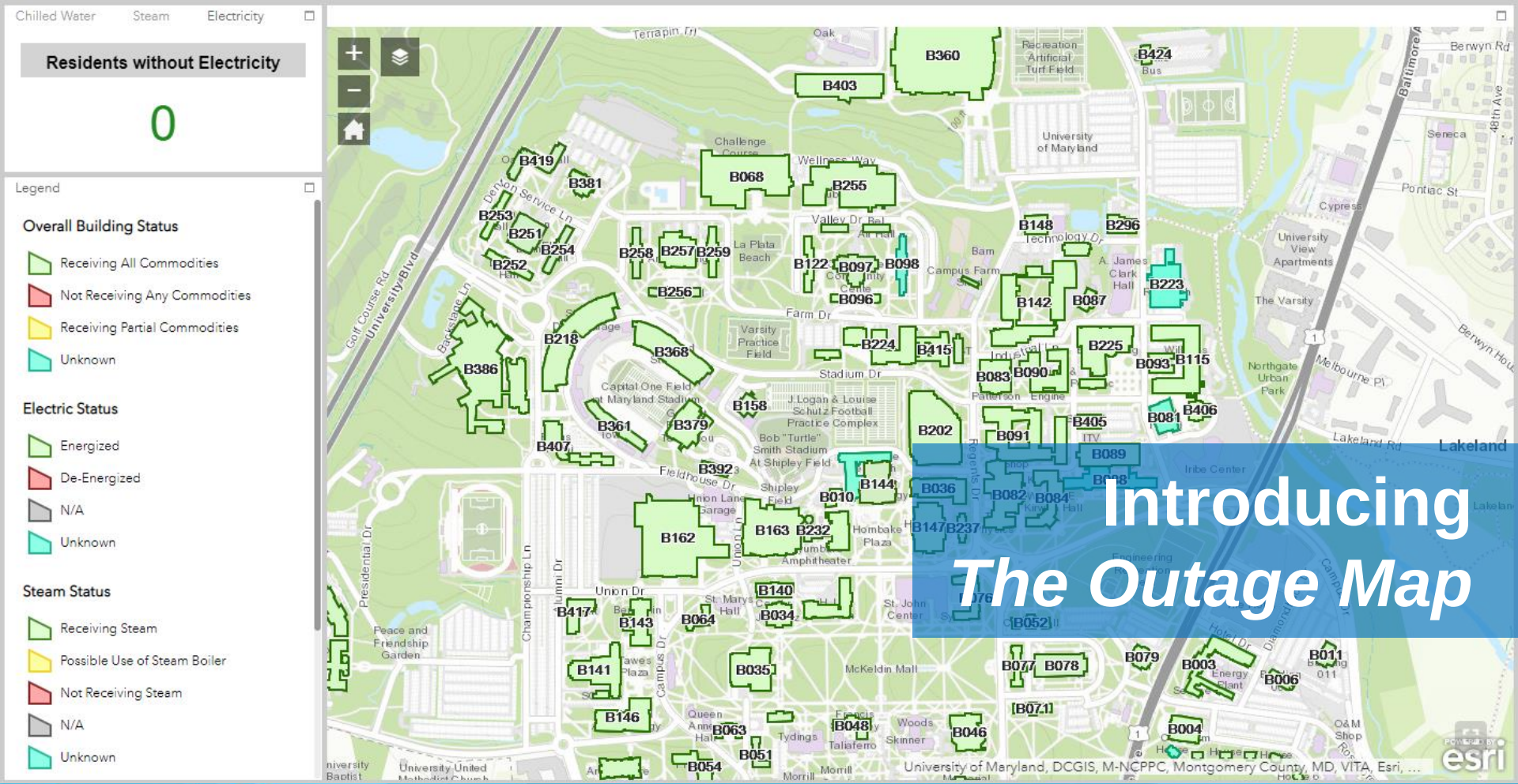
Result 2: Accurate Data on Affected Buildings





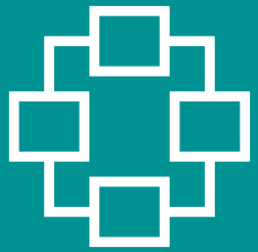
Feeder Loop Drill-down Screen

© Copyright 2018 OSIsoft, LLC



© Copyright 2018 OSIsoft, LLC

Challenge: No Distribution System Awareness

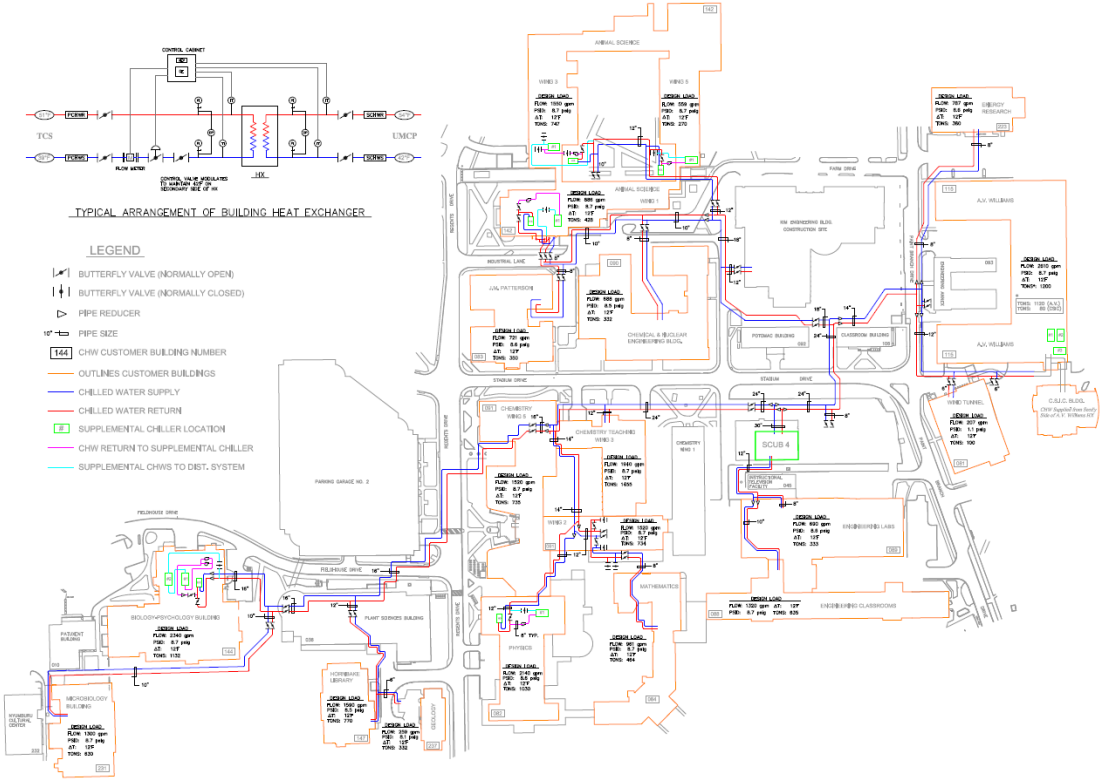


No Distribution System Awareness

Static CAD drawings

No insight into “hotspots”

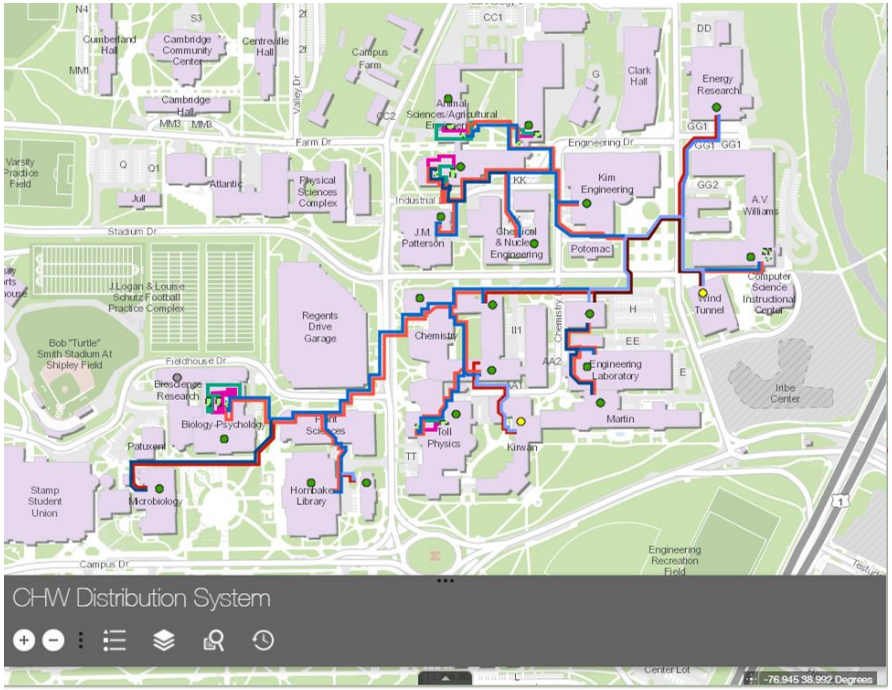
Data access impractical or non-existent



© Copyright 2018 OSIsoft, LLC

Solution: Multi-Platform Awareness

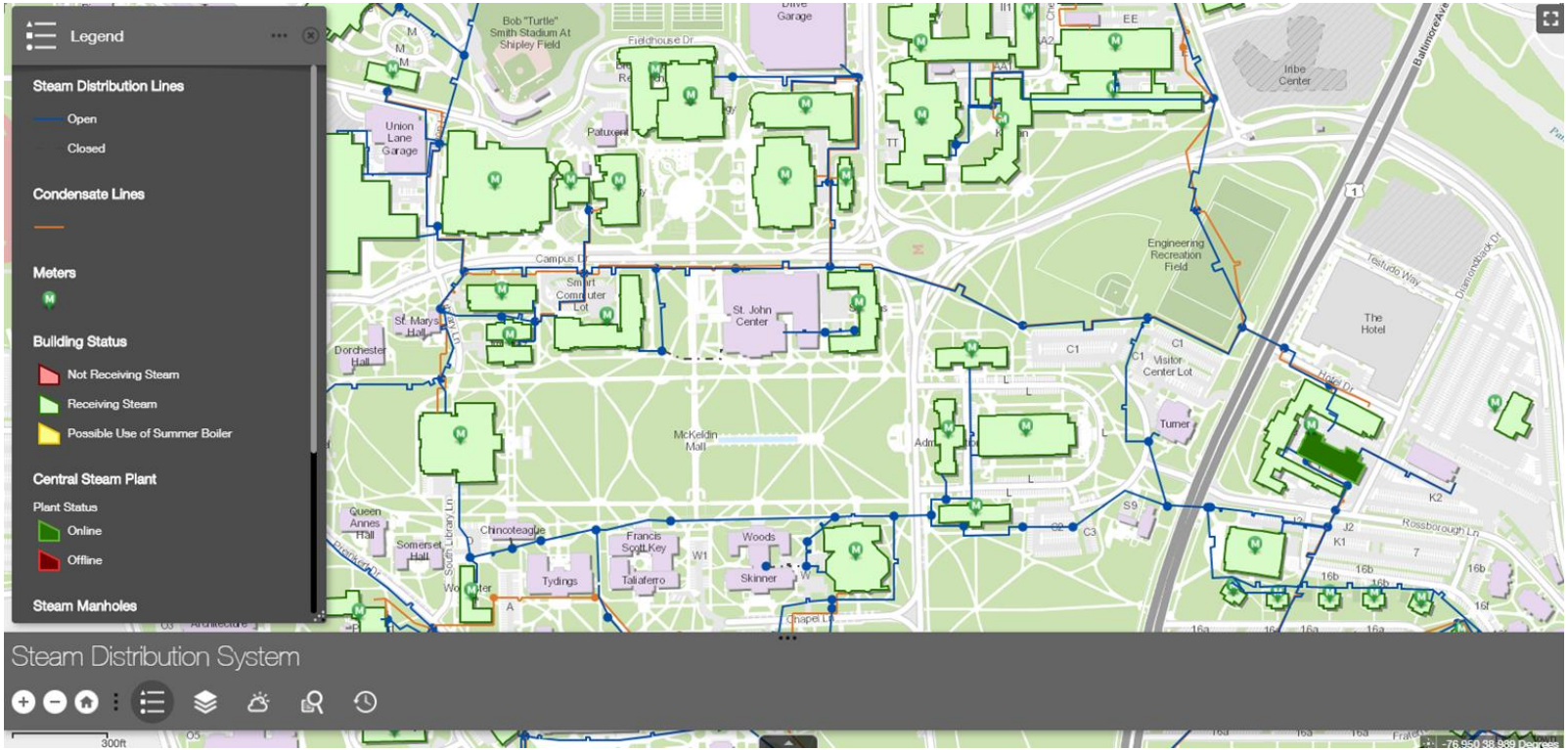
- PI Integrator for Esri® ArcGIS®
  - Transformed CAD drawings
  - Enriched layers with data
  - Created ArcGIS® WebApps
- PI Vision-based drill-downs



Chilled Water Distribution ArcGIS® WebApp

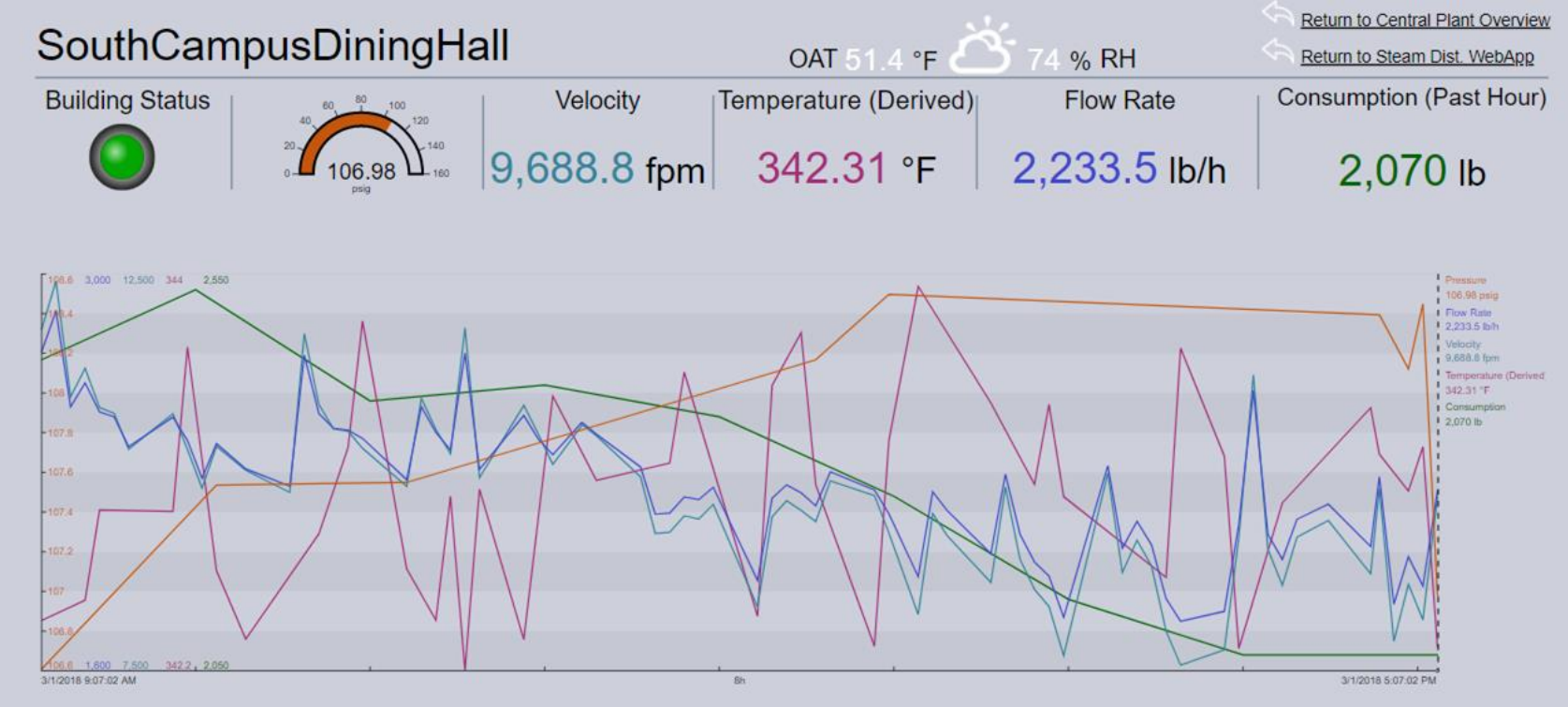
© Copyright 2018 OSIsoft, LLC

Result: Intuitive Visuals with Actionable Data



Steam Distribution ArcGIS® WebApp

© Copyright 2018 OSIsoft, LLC



Steam Drill-down Screen

© Copyright 2018 OSIsoft, LLC

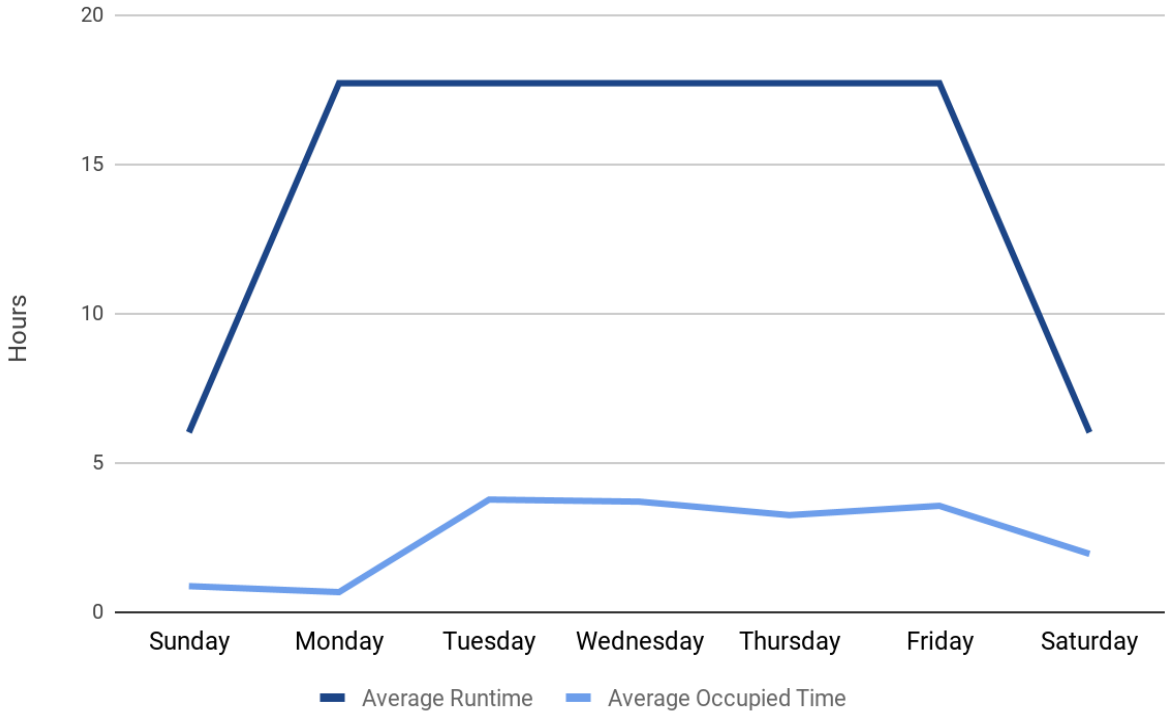
Challenge: Reduce Classroom Conditioning

Reduce Classroom Conditioning

Manual scheduling

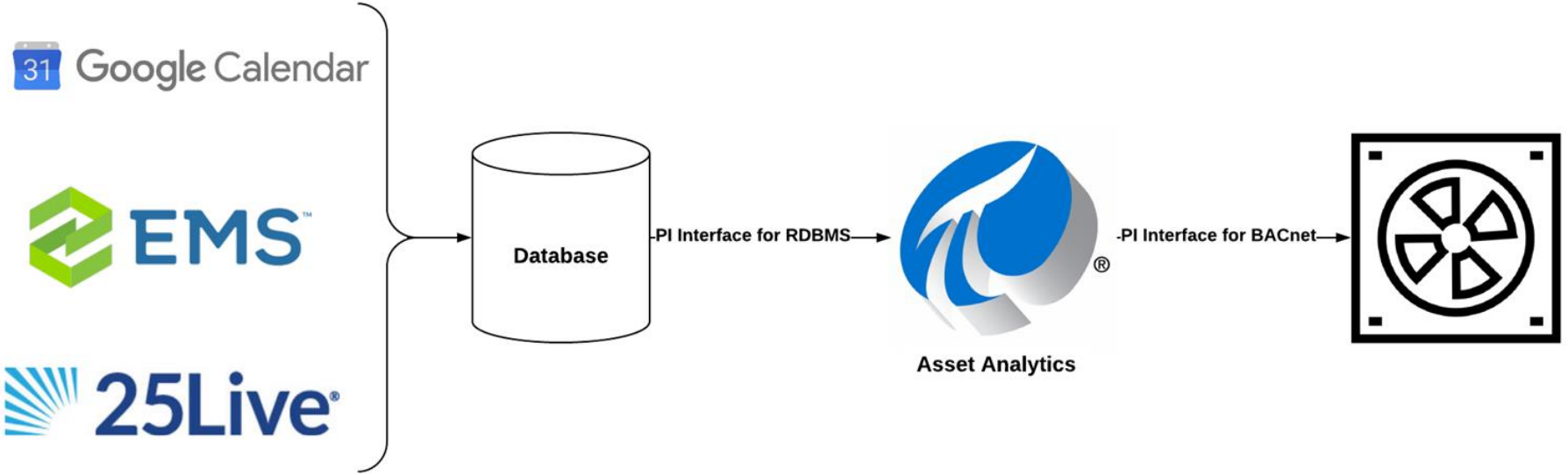
Overuse of equipment

Unnecessary energy use



© Copyright 2018 OSIsoft, LLC

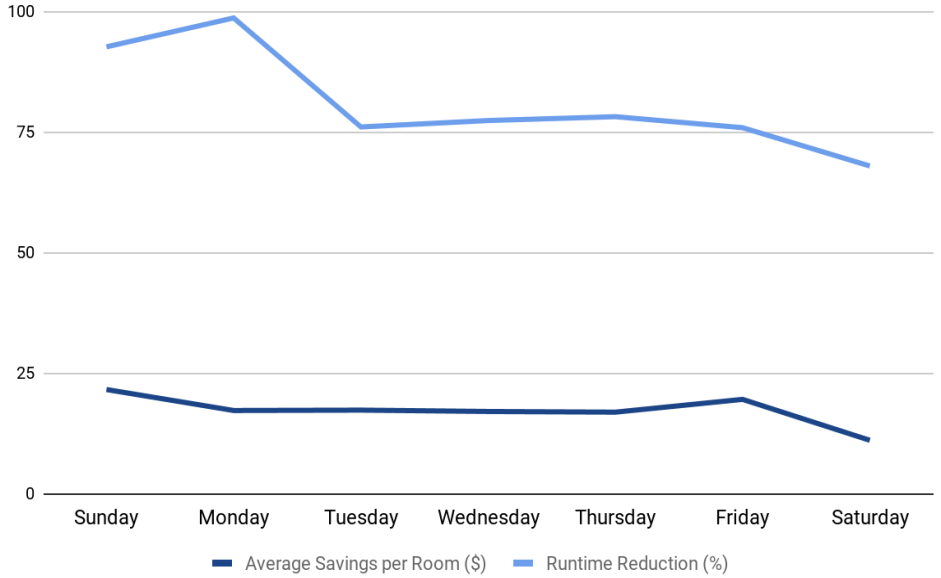
Solution: Smart HVAC Scheduling



© Copyright 2018 OSIsoft, LLC

Result: Resource Optimization

- Automated scheduling
- Reduced runtime
- Energy savings



Average Savings and Runtime Reduction

© Copyright 2018 OSIsoft, LLC

Connecting a Campus Infrastructure

COMPANY and GOAL

The University of Maryland, College Park Facilities Managements (FM) aims to continuously improve responsiveness, cost effectiveness, and service quality while meeting or exceeding customer expectations.

UNIVERSITY OF MARYLAND

DSA

CHALLENGE

No real-time operational transparency, causing delayed response and recovery times

- No remote monitoring of CHP Plant, requiring a physical visit
- Highly customized scripts and multiple UIs required to capture and view data from other systems

SOLUTION

Situational Awareness through data centralization, visualization, and analysis using the PI System

- Utilizing 5 interfaces to collect data
- Waterfall Secure Gateway for secure connectivity to Plant data
- PI Vision and Esri ArcGIS® to visualize data

RESULTS

Resource optimization, improved incident response, and empowered FM staff

- Reduced electrical outage response times from up to 90 minutes to almost instantaneous
- Up to $500,000 annually in cost avoidance from mechanical room flood prevention

© Copyright 2018 OSIsoft, LLC

What's Next

- ArcGIS® integration of remaining utility grids
- Monitoring of Emergency Power Generation and UPS units
- Smart HVAC Scheduling expansion
- Integration with work order management system
- Building demand forecasting

© Copyright 2018 OSIsoft, LLC

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please don’t forget to…

complete the Post Event Survey

© Copyright 2018 OSIsoft, LLC

Contact Information

Don Hill
dhill@umd.edu
Assistant Director,
Facilities Performance
UMCP

Dave Shaughnessy
dshaugn@umd.edu
Assistant Director, Utilities
UMCP

Kelsey Bobeck
Kelsey.Bobeck@dsainc.com
OSIsoft Implementation Lead
DSA, Inc.

© Copyright 2018 OSIsoft, LLC

Thank You

謝謝
KEA LEBOHA
TAPADH LEIBH
고맙습니다
БАЯРЛАЛАА
MISAOTRA ANAO
DZIĘKUJĘ CI
NGIYABONGA
GRÀCIES
SALAMAT
OBRIGADO
شكرا
TEŞEKKÜR EDERIM
DANKON
TANK
TAPADH LEAT
DANKIE
TERIMA KASIH
KÖSZÖNÖM
СПАСИБО
MULȚUMESC
OSIsoft
FAAFETAI
РАКМЕТ СІЗГЕ
HVALA
ESKERRIK ASKO
GO RAIBH MAITH AGAT
HVALA
ХВАЛА ВАМ
БЛАГОДАРЯ
GRACIAS
THANKYOU
TEŞEKKÜR EDERIM
ТИ БЛАГОДАРАМ
MAHADSANID
DANK JE
ΕΥΧΑΡΙΣΤΩ
GRATIAS TIBI
GRAZIE
TAK
DANKE
AČIŪ
SALAMAT
MAHALO IĀ ʻOE
TAKK SKAL DU HA
ДЯКУЙ
RAHMAT
MERCI
GRAZZI
ÞAKKA ÞÉR
ありがとうございました
DI OU MÈSI
HATUR NUHUN
РАХМАТ САГА
ĎAKUJEM
SIPAS JI WERE
TERIMA KASIH
MATUR NUWUN
CẢM ƠN BẠN
FALEMINDERIT
UA TSAUG RAU KOJ
WAZVIITA
ТИ БЛАГОДАРАМ
СИПОС