

AI on the Front Lines: Fault Detection, Compliance, and the Vanishing Workforce



Wallace Rucki
Director of Facilities & Plant Operations
Beth Israel Lahey Health



Mark Pipher
VP and General Manager
FacilityConneX

Session Description

AI On The Front Lines

AI Fault Detection and Diagnostics is transforming how healthcare facilities meet ASHRAE/ASHE Guideline 43 and USP 800 — catching ventilation and pressure faults instantly. Discover how agentic AI is closing compliance gaps and filling the void left by a retiring workforce.



Learning Objectives

AI on the Front Lines

1

Explain how through **real life use cases** at Beth Isreal Lahey Health, Brown University Health, and Southcoast Health of **AI-driven Fault Detection and Diagnostics** supports compliance with ASHRAE/ASHE Guideline 43 and USP General Chapter 800.

2

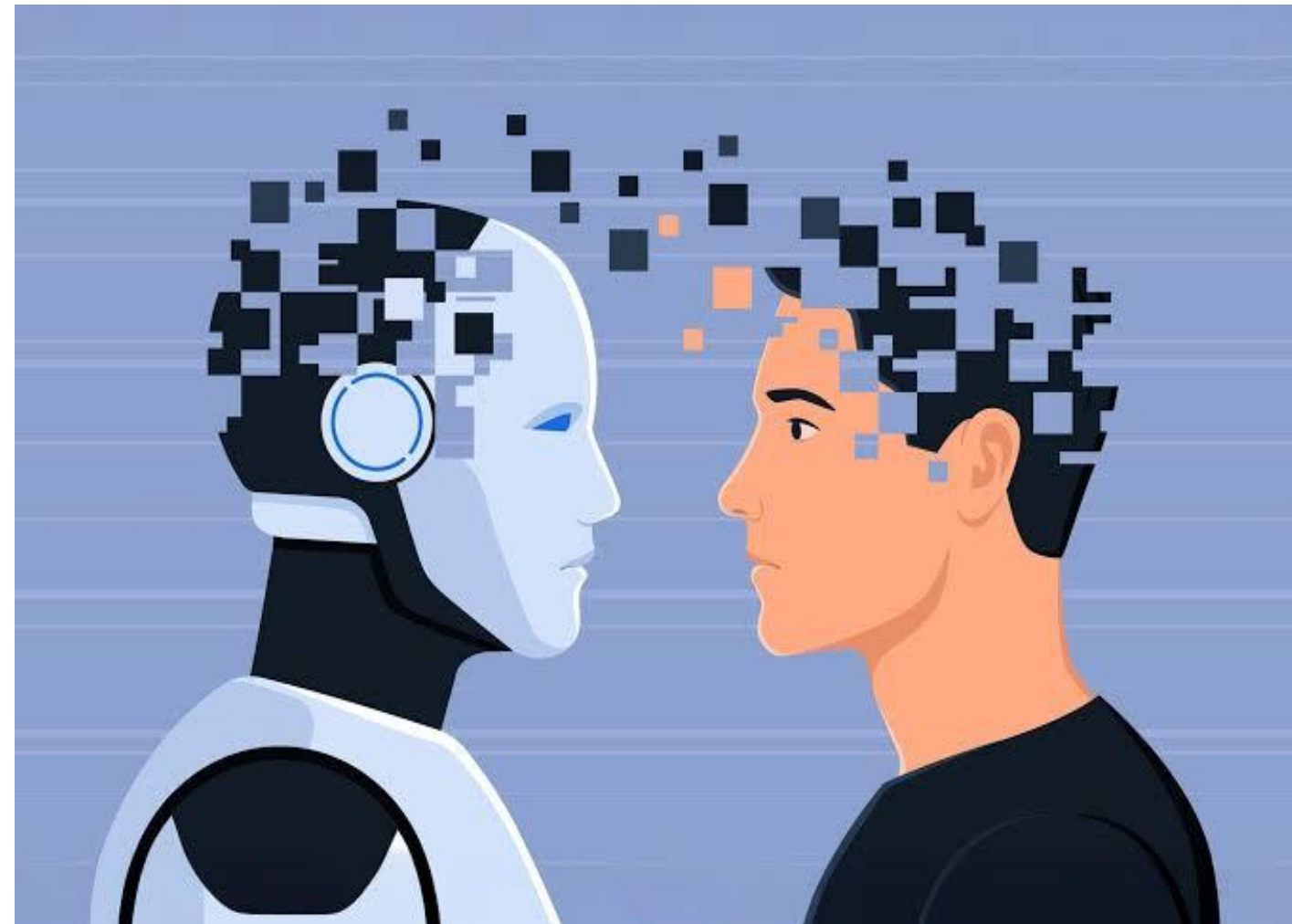
AI Fault Detection and Diagnostics is transforming how healthcare professionals are **catching ventilation and pressure faults instantly**. Discover how agentic AI is closing compliance gaps and filling the void left by a retiring workforce.

3

Evaluate how emerging **agentic AI methods** can offset the loss of a retiring facilities workforce by capturing tacit troubleshooting knowledge and acting as a **force multiplier for leaner operations teams**.

Demystify Use of AI

AI on the Front Lines



The Mind Meld



The Replacement Worker



The Manager

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Demystify Use of AI

AI on the Front Lines



The Mind Merit the Replacement Work the Manager

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What is REAL Today!

AI on the Front Lines



Operational AI

Operational AI is a secure focused approach to using analytics for specific equipment and process types. It comes in the form of fault detection, advanced diagnostics, optimization, and M&V.

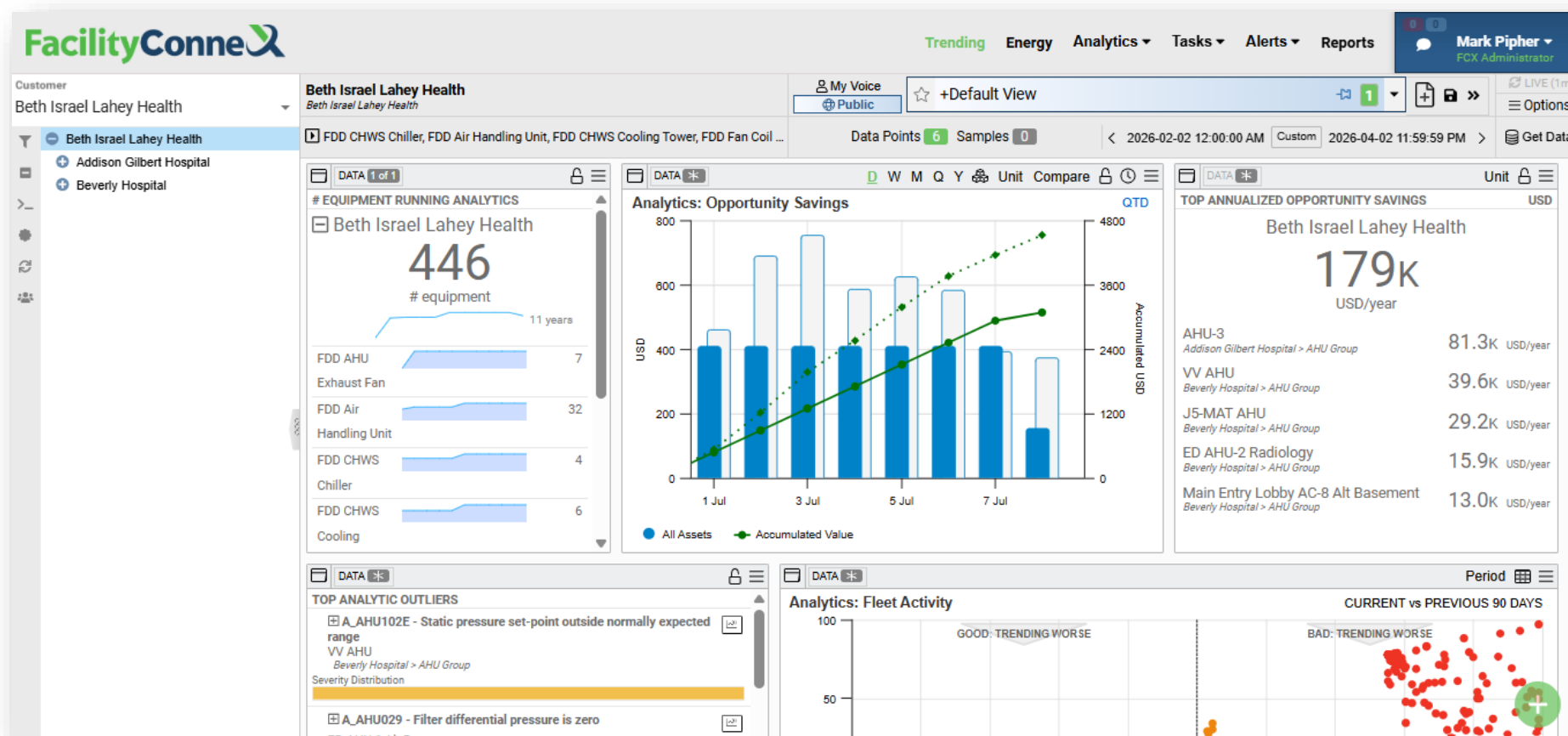
Success in AI FDD Solutions

The Timeline...

- Started FDD in 2023
- Incentives thru National Grid Program
- Monitoring HVAC, Chilled Water System, Critical Areas, and Boilers

The Result Snapshot...

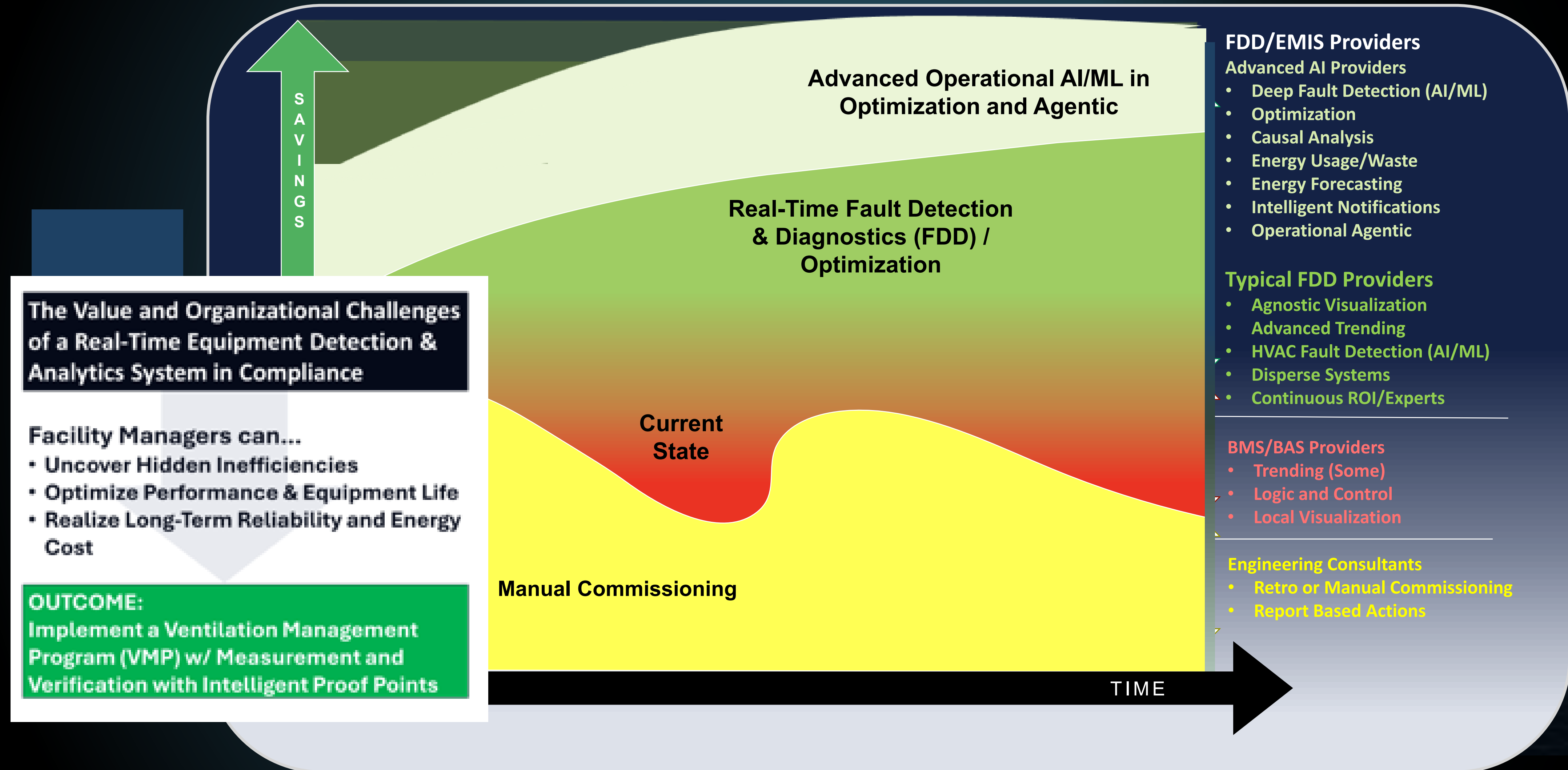
- ✓ 400+ Equipment Assets Deployed
- ✓ Over **\$250,000** In Potential Savings in 2025
- ✓ 500,000+ FDD Checks Per Day
- ✓ Patented Chilled Water Optimization (Oct 2026)



Beverly Hospital
Addison Gilbert Hospital
Anna Jaques Hospital



Operational AI in Your Environment



What Can Operational AI Do For You?

AI on the Front Lines

Visibility/M&V



- 1000 Pieces of Equipment
- 10,000 Data Points
- 100's of Control Logic Sequences

Decision Making/Planning



- Ventilation Management Plan
- Energy Planning
- Capital and Deferred Maintenance

Analysis/Reporting



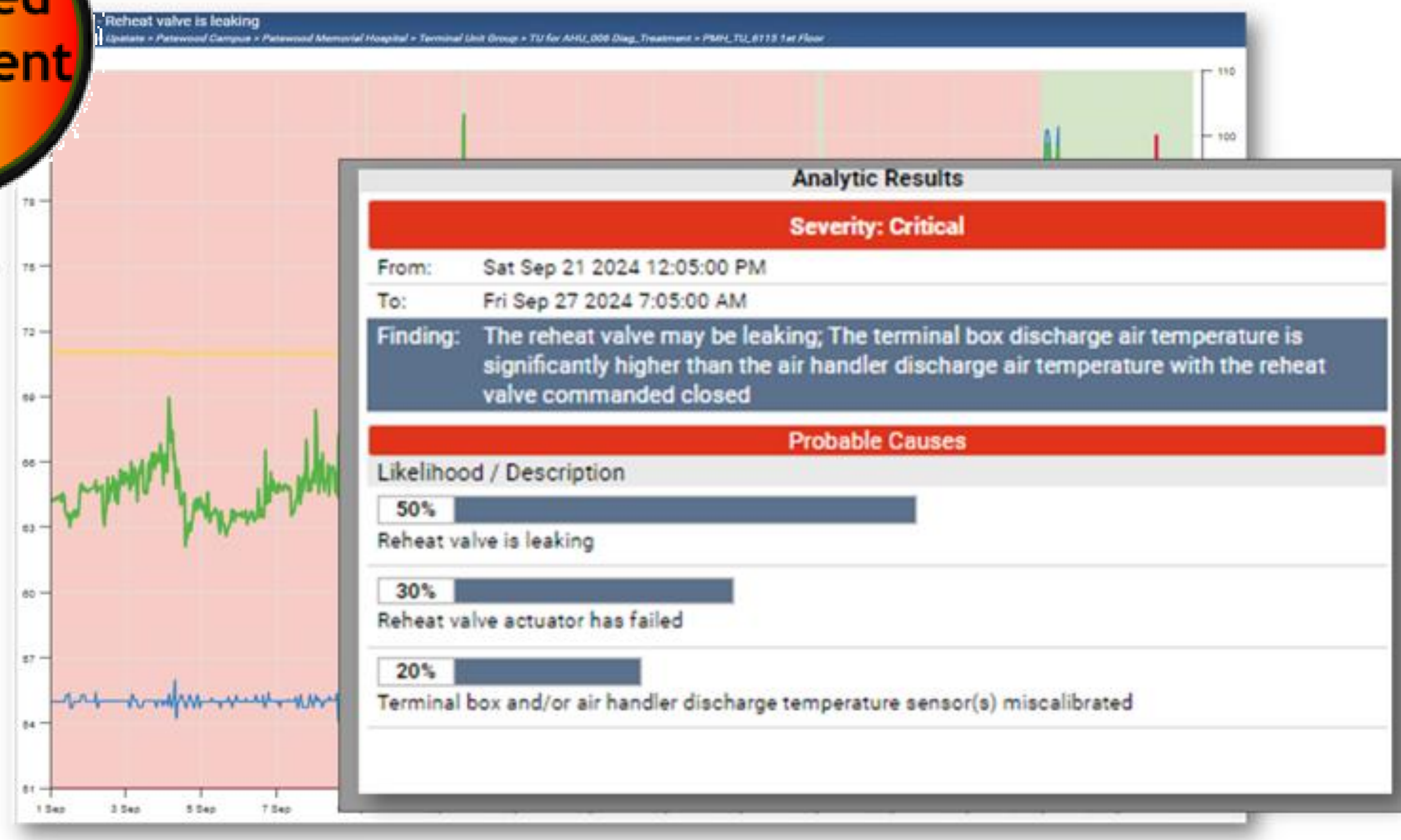
- Causal and Optimization Analysis
- Intelligent Notifications
- Compliance and Regulatory



How Many Values Do You Have?

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FDD: Detection of the Leaking Valve



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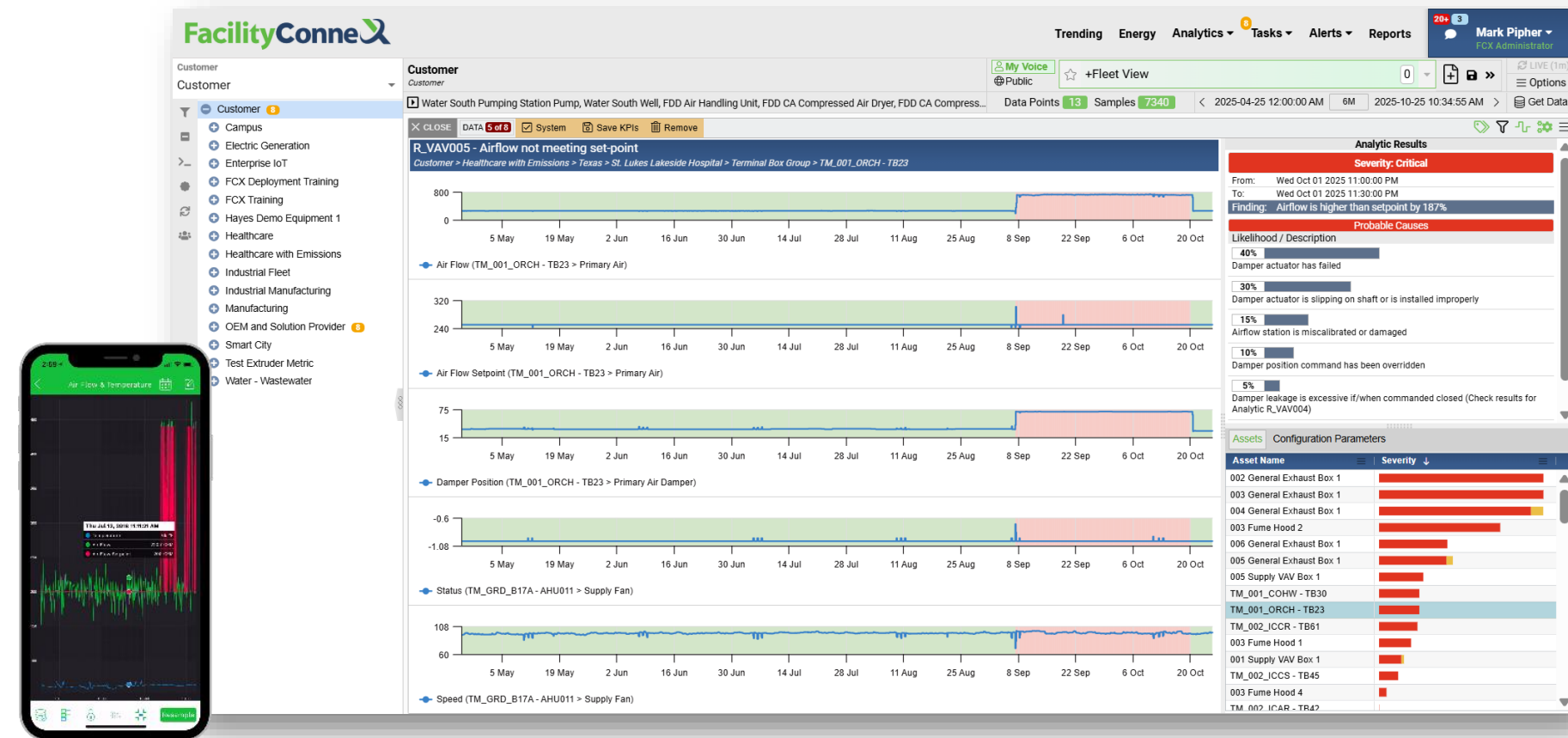
Return on M&V for 10 Years!

The Timeline...

- Started FDD in 2016
- 10 Years of Proven Return on Investment
- Monitoring HVAC, Chilled Water System, Critical Areas, and Boilers

The Result Snapshot...

- ✓ 1200+ Equipment Assets Deployed
- ✓ Over **\$300,000** In Potential Savings in 2025
- ✓ 2,300,000+ FDD Checks Per Day
- ✓ Six-Month ROI Year Over Year



Charlton Hospital
St. Lukes Hospital
Tobey Hospital
Fairhaven Cancer Center



Ventilation Management Plan (VMP)

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Operational Guideline...

...highlights the importance of ventilation system management with increasing scrutiny. Can your facilities afford inefficiencies?

The Guideline Pushes You Towards:

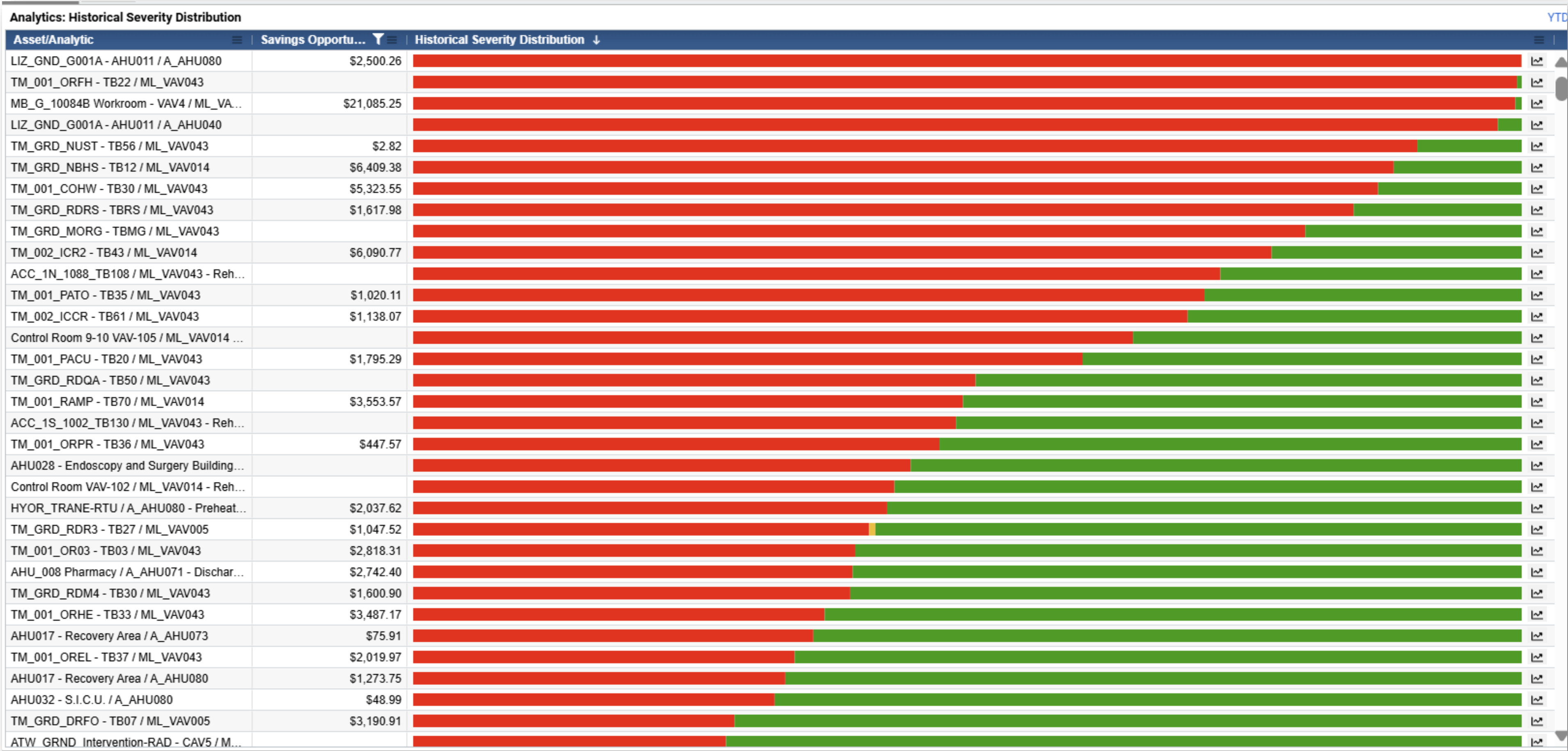
- Implementing a Ventilation Management Program (VMP)
- Maintaining Consistency in HVAC Operations
- Addressing Excursions and Operational Variations
- Applying Reliability-Centered Maintenance
- Supporting Accreditation Compliance

AHRAE Guideline 43 acknowledges that not every facility has brand-new equipment and also offers guidance for older systems.



Blow Up of Southcoast AHU FDD...

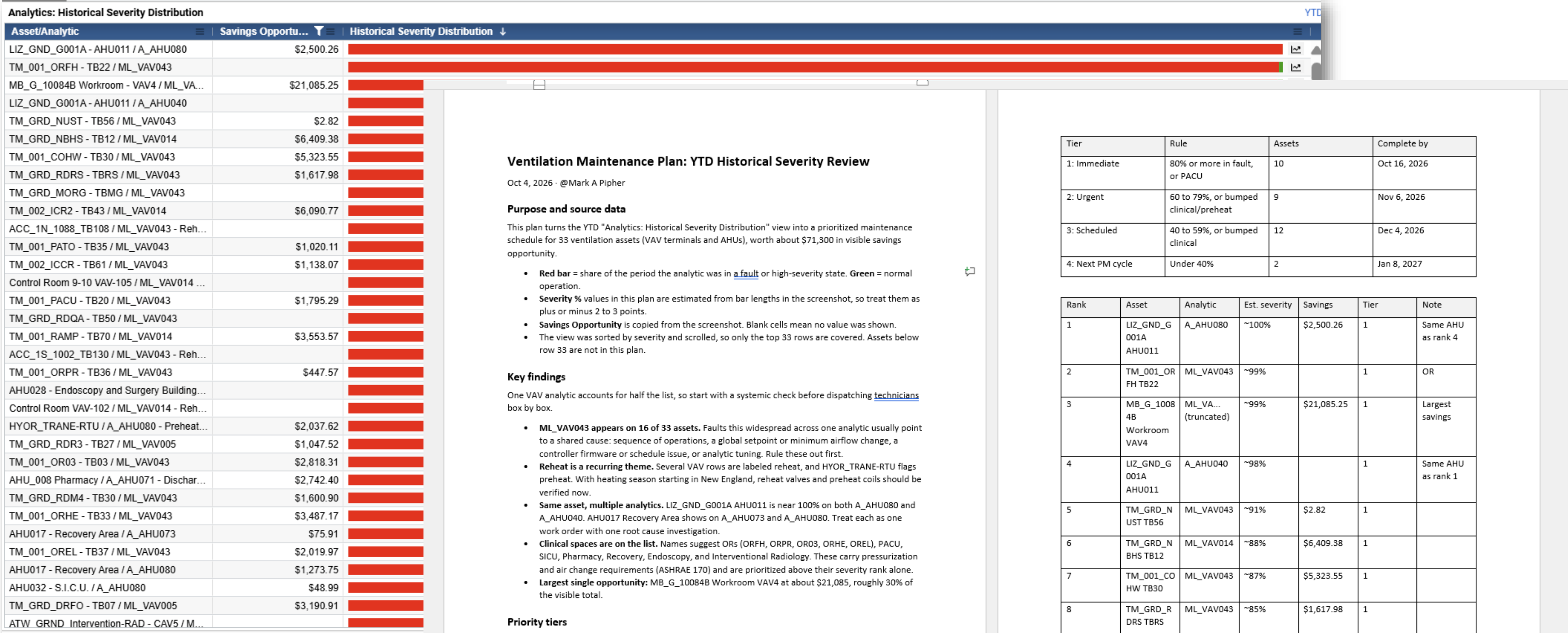
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AI Generate VMP Section...

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Embedded Inspection Checklist...

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Analytics: Historical Severity Distribution

Asset/Analytic

Savings Opportu...

Historical Severity Distribution

LIZ_GND_G001A - AHU011 / A_AHU080	\$2,500.26	
TM_001_ORFH - TB22 / ML_VAV043		
MB_G_10084B Workroom - VAV4 / ML_VA...	\$21,085.25	
LIZ_GND_G001A - AHU011 / A_AHU040		
TM_GRD_NUST - TB56 / ML_VAV043	\$2.82	
TM_GRD_NBHS - TB12 / ML_VAV014	\$6,409.38	
TM_001_COHW - TB30 / ML_VAV043	\$5,323.55	
TM_GRD_RDRS - TBR5 / ML_VAV043	\$1,617.98	
TM_GRD_MORG - TBMG / ML_VAV043		
TM_002_ICR2 - TB43 / ML_VAV014	\$6,090.77	
ACC_1N_1088_TB108 / ML_VAV043 - Reh...		
TM_001_PATO - TB35 / ML_VAV043	\$1,020.11	
TM_002_ICCR - TB61 / ML_VAV043	\$1,138.07	
Control Room 9-10 VAV-105 / ML_VAV014 ...		
TM_001_PACU - TB20 / ML_VAV043	\$1,795.29	
TM_GRD_RDQA - TB50 / ML_VAV043		
TM_001_RAMP - TB70 / ML_VAV014	\$3,553.57	
ACC_1S_1002_TB130 / ML_VAV043 - Reh...		
TM_001_ORPR - TB36 / ML_VAV043	\$447.57	
AHU028 - Endoscopy and Surgery Building...		
Control Room VAV-102 / ML_VAV014 - Reh...		
HYOR_TRANE-RTU / A_AHU080 - Preheat...	\$2,037.62	
TM_GRD_RDR3 - TB27 / ML_VAV005	\$1,047.52	
TM_001_OR03 - TB03 / ML_VAV043	\$2,818.31	
AHU_008 Pharmacy / A_AHU071 - Dischar...	\$2,742.40	
TM_GRD_RDM4 - TB30 / ML_VAV043	\$1,600.90	
TM_001_ORHE - TB33 / ML_VAV043	\$3,487.17	
AHU017 - Recovery Area / A_AHU073	\$75.91	
TM_001_OREL - TB37 / ML_VAV043	\$2,019.97	
AHU017 - Recovery Area / A_AHU080	\$1,273.75	
AHU032 - S.I.C.U. / A_AHU080	\$48.99	
TM_GRD_DRFO - TB07 / ML_VAV005	\$3,190.91	
ATW_GRND_Intervention-RAD - CAV5 / M...		

VAV terminal units

- ☐ Airflow sensor and flow cross: clean, check tubing, calibrate against a hood reading
- ☐ Damper and actuator: full stroke test, check linkage slip and commanded vs actual position
- ☐ Reheat valve: stroke test, check for leak-by and stuck-open or stuck-closed
- ☐ Discharge air temp sensor: verify reading against a reference probe
- ☐ Zone temp sensor: verify calibration and location (not near diffusers or heat sources)
- ☐ Min/max airflow and heating setpoints: compare to design and current schedule
- ☐ Controller: point mapping, overrides, and communication health
- ☐ Clinical rooms: verify air change rate and pressure relationship meet ASHRAE 170 after repair

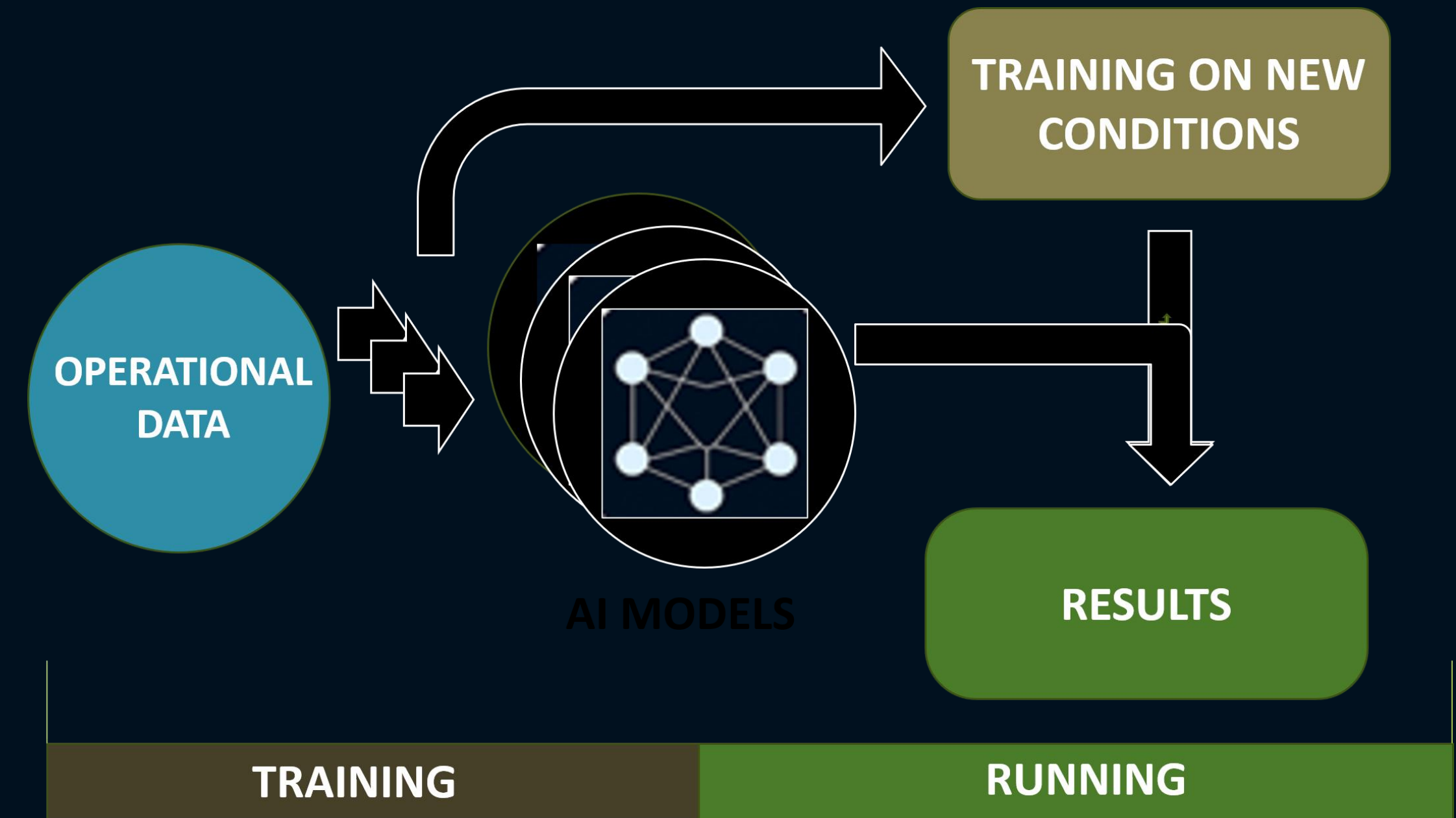
Air handling units

- ☐ Preheat coil and valve: stroke test, freeze stat test, check for coil fouling (priority before first freeze)
- ☐ Discharge air temp loop: review trend for hunting or offset, [retune](#) if needed
- ☐ Outside, return and mixed air dampers: stroke test and seal check
- ☐ Filters: check pressure [drop](#), replace per differential not calendar
- ☐ Fans: belts, bearings, VFD faults, static pressure control
- ☐ Sensors: calibrate supply, mixed and outside air temperatures and duct static
- ☐ Cooling coil and drain pan: clean, confirm drainage



Autonomous Predictive AI: Continuous Self-Adaptation

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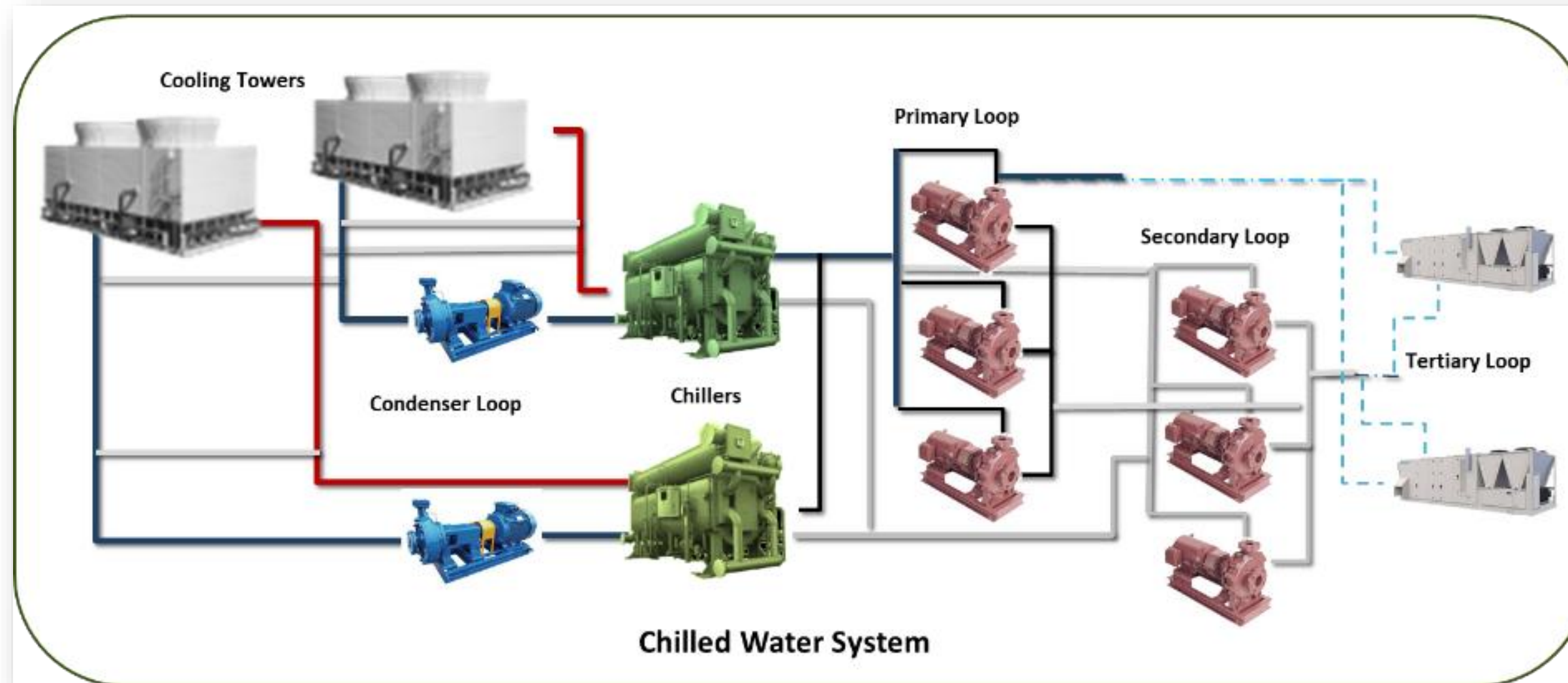


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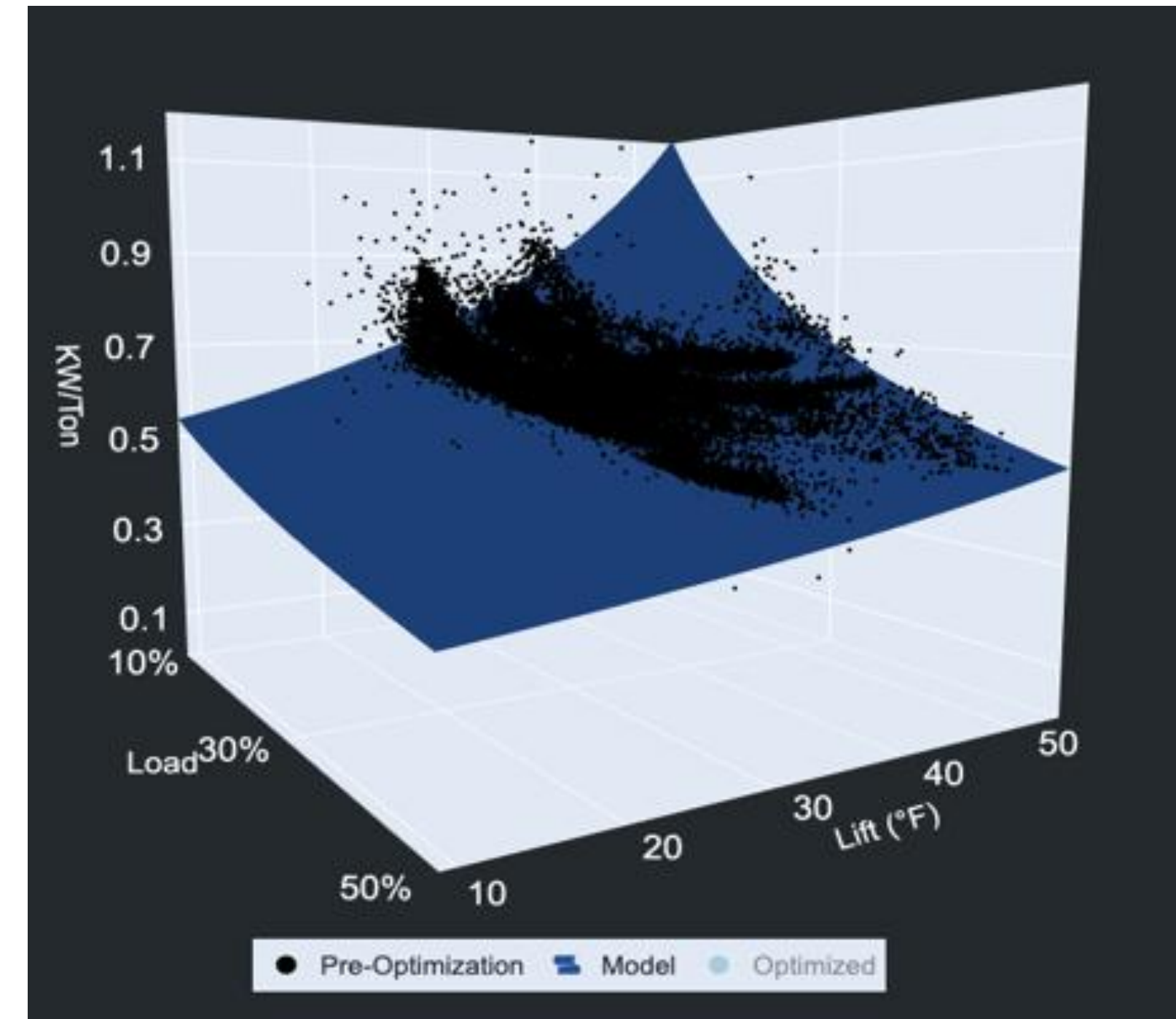
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AI Machine Learning In Action...

AI on the Front Lines



Prisma Health



On Average 25% of Electrical Draw is YOUR Chilled Water Plants

Continuous M&V and ROI

Advanced Machine Learning Optimization

- Dynamic Condenser Water Temperature Reset Algorithm
- Dynamic Condenser Water Flow Reset Algorithm
- Chiller Sequencing Strategy
- Chiller Stage Up & Down Demand Setpoints
- Dynamic Chiller Load Balancing Algorithm

Patented ML Technology By

FacilityConneX

FacilityConneX/Exergenics Proprietary - Access to this information is restricted to those specifically authorized by FacilityConneX LLC.

Automated and Decision-Making Results...

AI on the Front Lines

Many
Benefits



Prisma Health



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Design and Compliance

AI on the Front Lines

Benefits of USP <800> Compliance

- Occupational Safety
- Patient Protection
- Environmental Containment
- Legal & Regulatory Compliance



Success in Compliance and Regulatory



The Timeline...

- Started FDD in 2020
- HVAC, Chilled Water System, Critical Areas, Energy/GHG and Boilers FDD and Optimization
- Patented Chilled Water Optimization (2026)

The Result Snapshot...

- ✓ 600+ Equipment Assets Deployed
- ✓ Over \$159,000 in Savings in 2026
- ✓ 500,000+ FDD Checks Per Day
- ✓ Over 1000+ Intelligent Alerting – Critical Areas

Critical Areas Results...

96 ORs/Pharmacies
1000+ Intelligent Alerts
300+ KPI for Safety

Driven by Policy
(30% Noise Reduction in Alerts)

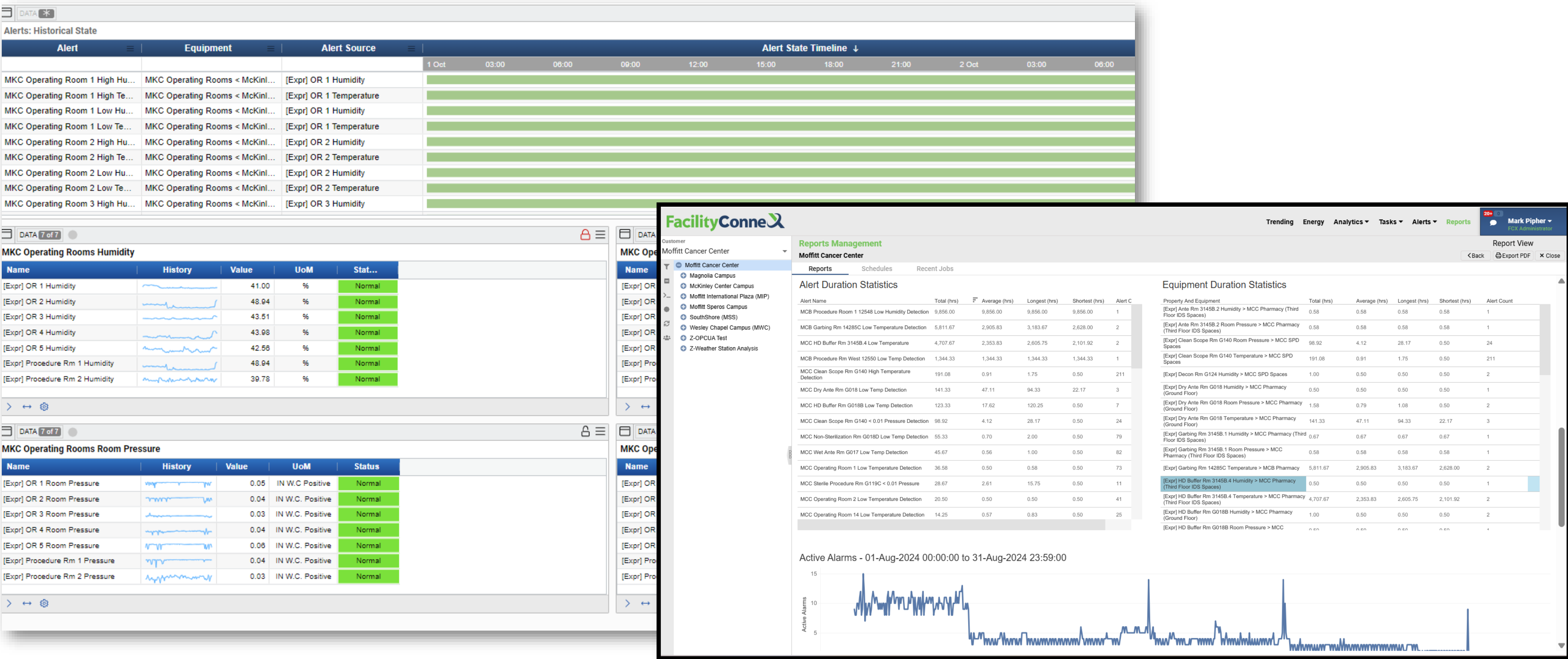
MMH Operating Rooms Temperature				
Name	History	Value	UoM	Status
[Expr] Angio CT1 Temperat...		65.30	F	Low
[Expr] Angio CT2 Temperat...		66.54	F	Low
[Expr] CT Biopsy Temperat...		67.52	F	Low
[Expr] MRI Temperature		66.21	F	Low
[Expr] OR 1 Temperature		68.54	F	Normal
[Expr] OR 2 Temperature		68.79	F	Normal
[Expr] OR 3 Temperature		68.32	F	Normal
[Expr] OR 4 Temperature		68.61	F	Normal
[Expr] OR 5 Temperature		68.65	F	Normal
[Expr] OR 6 Temperature		68.27	F	Normal
[Expr] OR 7 Temperature		68.29	F	Normal
[Expr] OR 8 Temperature		68.51	F	Normal
[Expr] OR 9 Temperature		68.32	F	Normal
[Expr] OR 10 Temperature		68.82	F	Normal
[Expr] OR 11 Temperature		66.17	F	Low
[Expr] OR 12 Temperature		67.99	F	Low
[Expr] OR 14 Temperature		64.64	F	Low

Moffitt Cancer Center
Moffitt Clinical Support Building
Moffitt McKinley Outpatient
Moffitt Memorial Hospital
Moffitt Research Center
Stabile Research Center
Moffitt Clinical Building
Moffitt International Plaza
Moffitt Speros Center
Moffitt Wesley
Moffitt Terrace Place
Proton Accelerator
Animal Research
MIOMS Plant
Cyclotron
CEP



Critical Care Dashboard

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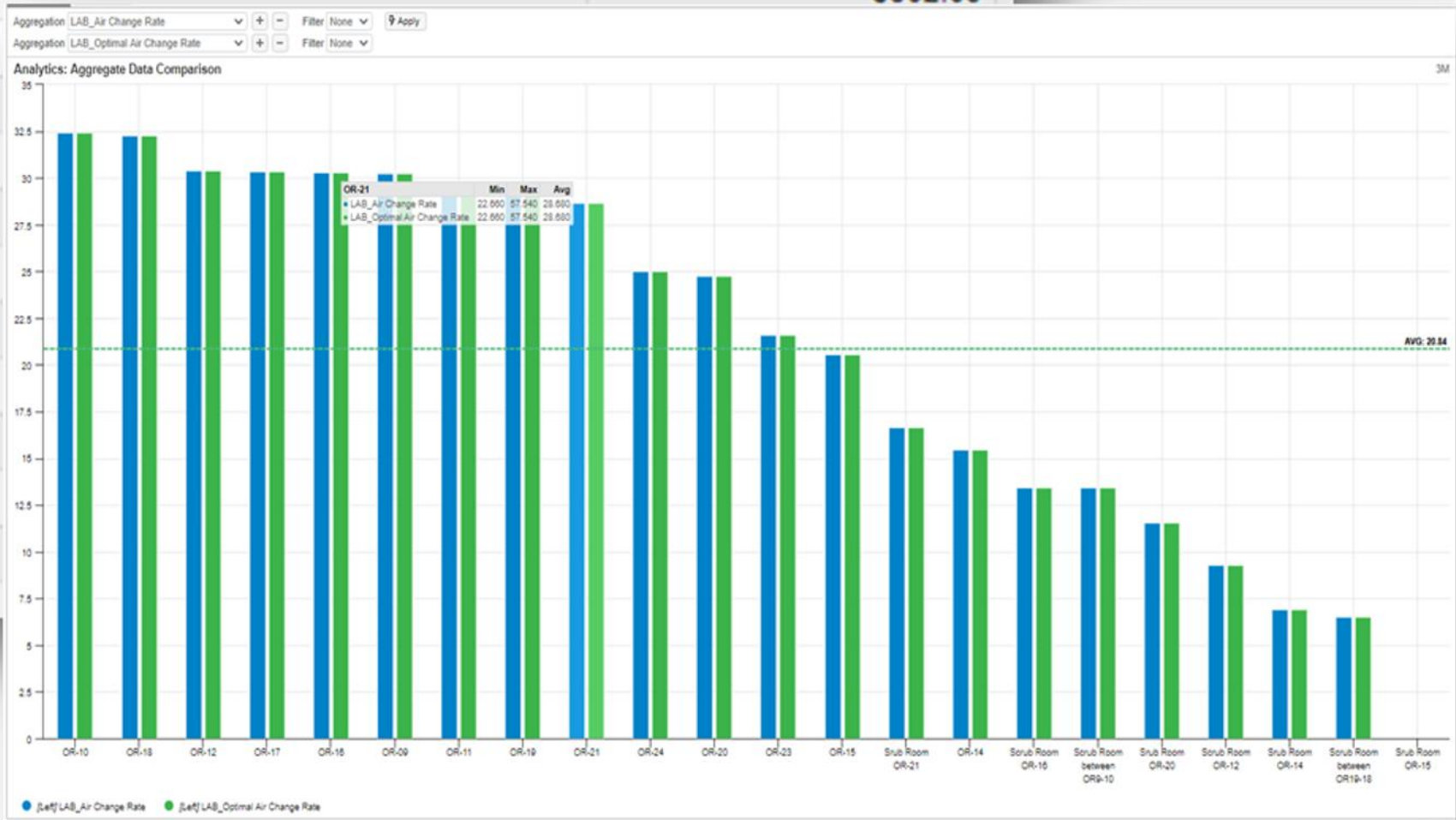
Every Room, All Environment Properties, Safe?

AI on the Front Lines

Critical Area Environmental Monitoring



R_LAB006D - Zone air change rate reduction recommendation		\$7,923.09
R-05		\$696.67
R-06		\$677.80
R-03		\$656.97
R-02		\$608.51
R-10		\$601.09
R-11		\$579.12
R-08		\$562.63
R-09		
R-12		
R-07		
R-13 UOR-1		
R-14 UOR-2		
SURG_G_CATH3		
OR-15		
MB_G_10069 Clean Workroom		
OR-18 Rm 1107		
OR-04		
OR-01		



Brown University Health



Interactive AI: Agents

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Agent Interactions...

AI on the Front Lines

Ask your building a question. Get an answer backed by its data.

The FCX Agent reads your alerts, analytics, energy and trend data inside FacilityConneX and explains what matters in plain language, with the numbers to back it up.

You 10/2/26, 12:...

What specific secondary metrics in the VAV damper or motor control are driving the \$9,706.86 annual savings opportunity, and should we prioritize repair or recalibration?

FCX Agent (Sources: Analytics) 10/2/26, 12:2...

On TM_002_ICR2 - TB43, VAV014 (reheating while above minimum airflow setpoint) is firing at 76.0% non-normal (critical severity, ML build) and 78.0% non-normal (critical severity, R build) of the time, the highest severity on this box, making it the clear driver of the \$9,706.86 savings opportunity. This looks like a validity-gate issue rather than a standalone VAV014 failure: recommend recalibration/control-loop fix first, not a reheat valve repair.

Why: the validity gate is firing hard on this same box

Analytic	Role	Severity on TM_002_ICR2 - TB43
VAV011 (ML)	Validity gate	99.7% non-normal (high severity)
VAV011 (R)	Validity gate	100.0% non-normal (high severity)
VAV014 (ML)	Subject fault	76.0% non-normal (critical severity)
VAV014 (R)	Subject fault	78.0% non-normal (critical severity)
VAV005 (R)	Tier 0, same unit	76.6% non-normal (low severity)
VAV035 (R)	Tier 0, same unit	76.9% non-normal (low severity)
VAV018 (R)	Tier 0, same unit	76.0% non-normal (low severity)

43 / R_VAV014, Savings

Agent Interactions...

AI on the Front Lines

One question turns a savings opportunity into a repair decision.

1 Analytics ranks a \$9,706 per year savings opportunity on a VAV terminal box

Asset/Analytic	Savings Opportu...	Historical Severity Distribution
TM_002_ICR2 - TB43 / ML_VAV014	\$7,663.66	
TM_002_ICR2 - TB43 / R_VAV014	\$9,706.86	
TM_002_ICCR - TB61 / ML_VAV043	\$1,409.25	
TM_002_ICCR - TB61 / R_VAV043	\$1,420.54	

2 You select the row and ask the question you would ask an engineer

What specific secondary metrics in the VAV damper or motor control are driving the \$9,706.86 annual savings opportunity, and should we prioritize repair or recalibration?

3 The agent names the fault, explains the cause and says what to do first

On TM_002_ICR2 - TB43, VAV014 (reheating while above minimum airflow setpoint) is firing at 76.0% non-normal (critical severity, ML build) and 78.0% non-normal (critical severity, R build) of the time, the highest severity on this box, making it the clear driver of the \$9,706.86 savings opportunity. This looks like a validity-gate issue rather than a standalone VAV014 failure: recommend recalibration/control-loop fix first, not a reheat valve repair.

Check VAV011 and VAV014 across all terminal boxes

Retry the topAnnualized savings breakdown

Show VAV005/VAV023/VAV035 trend on TB43

Pull alert history for TM002ICR2 - TB43

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Agent Interactions...

AI on the Front Lines

WHERE THIS GOES NEXT

Your design intent becomes the agent's context.



Compare operation to design

Upload the sequence of operations, specifications and drawings. The agent checks how each air handler, terminal box and plant actually runs against how it was designed to run.



Tailor analytics to the design

Design values set the thresholds. Analytics and alert limits are proposed from the documents for your approval, and equipment with no coverage is flagged.



Insight from design deviation

Supply air above design, an economizer ignoring its sequence, a chilled water plant short of design efficiency: quantified in energy and dollars, with the fix.



Available today: paste a chart screenshot or an equipment photo into the chat and the agent reads it as part of your question.

Use of AI Drives Results...

Reduction in Energy Consumption

\$ 15 – 25%

- Reduction in HVAC usage
- Reduction in Central Plants
- Reduction in overall Utility Usage and Demand

Reduction in Maintenance Costs

 **10 – 40%**

- Condition Aware
- Prioritization and Planning
- FTE Efficiency

Reduction in Equipment Downtime

 **30 – 50%**

- Predictive Detection
- Prevent interrupted revenue
- Safety and Compliance

OPERATION EFFICIENCY UP BY 30+%

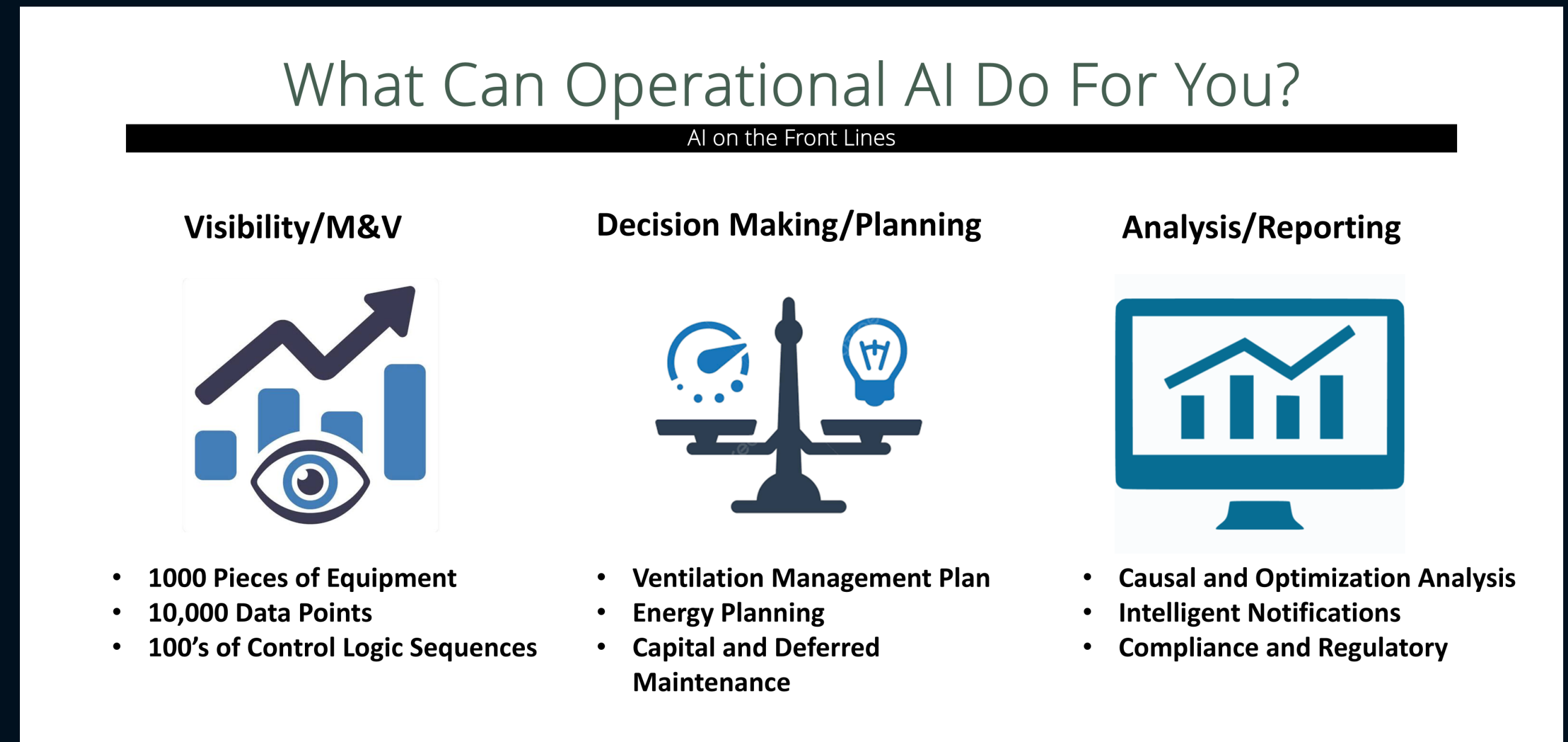
Conclusions/Questions

How can you use an assistant to help your everyday tasks?

Do you get the time to analyze that report or are you lucky just to get the report done?

Are you worried about operational knowledge?

Your organization know how to leverage AI?



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