Terracon

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Building Value: Strategies for Performance, Resilience, and ROI
WEBINAR SERIES

Recommissioning Building Systems for Enhanced Operations & Efficiency

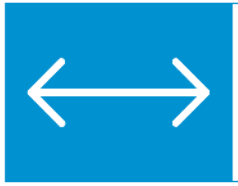
Injury and Incident Free (IIF) Moment

Terracon
Explore with us

SMITH SYSTEM

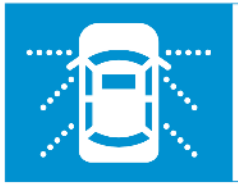
5 KEYS FOR TIME CHANGES

GET THE BIG PICTURE
Changing light conditions and more hidden hazards demand broader visual awareness



KEEP YOUR EYES MOVING
Helps combat fatigue and night-vision limitations

AIM HIGH IN STEERING
Anticipates hazards in newly dark commutes



MAKE SURE THEY SEE YOU
Visibility for others is reduced - lighting and signaling matter more

LEAVE YOURSELF AN OUT
Drowsy/inattentive drivers require more buffer space

Daylight Savings ends November 2nd

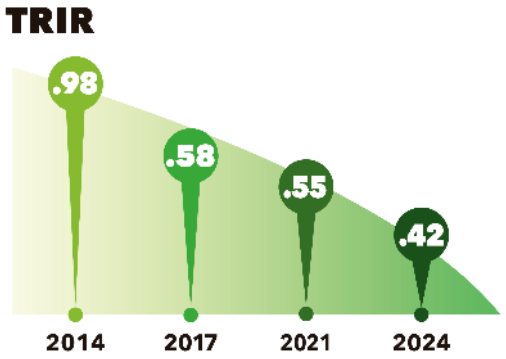
ABOUT TERRACON

Our Services:

- Facilities
- Environmental
- Geotechnical
- Materials

85,000+
PROJECTS COMPLETED
IN 2024
WITH OVER 23,000 CLIENTS

ENR RANKINGS 2025
#19
TOP 500
DESIGN FIRMS



Recommissioning Building Systems

People are a company's largest investment - often 10 to 100 times greater than its energy costs.

Source: Lawrence Berkeley National Laboratory, "Improving Energy Efficiency through Commissioning," LBNL-6495E (2009).

What is Recommissioning (ReCx)?

- A systematic quality-focused process to restore building systems to optimal performance in buildings previously commissioned.
- Targets existing systems—not major equipment replacement.
- Addresses HVAC, lighting, hot water, and critical systems.
- Improves energy efficiency, comfort, and reliability.

Existing Building Commissioning (EBCx)

Retro-Cx

Building not previously Cx'd

Ongoing Cx

Cx continues during occupancy/ operations

ReCx

Previously Cx'd

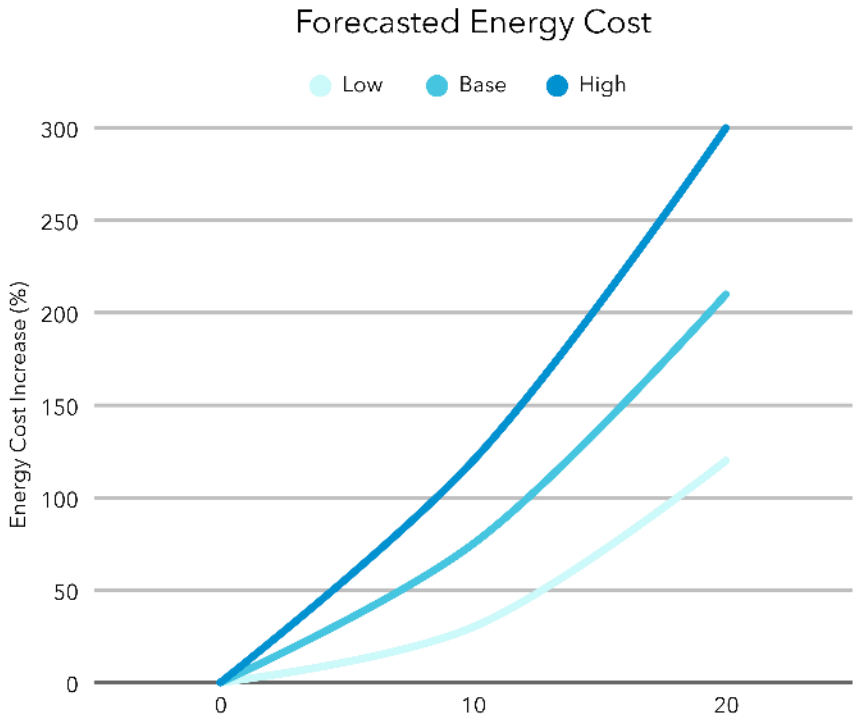
Monitoring Based on Cx

Ongoing Cx approach utilizing data monitoring/ analytics

Continuous Cx®

A Texas A&M methodology/ ongoing process

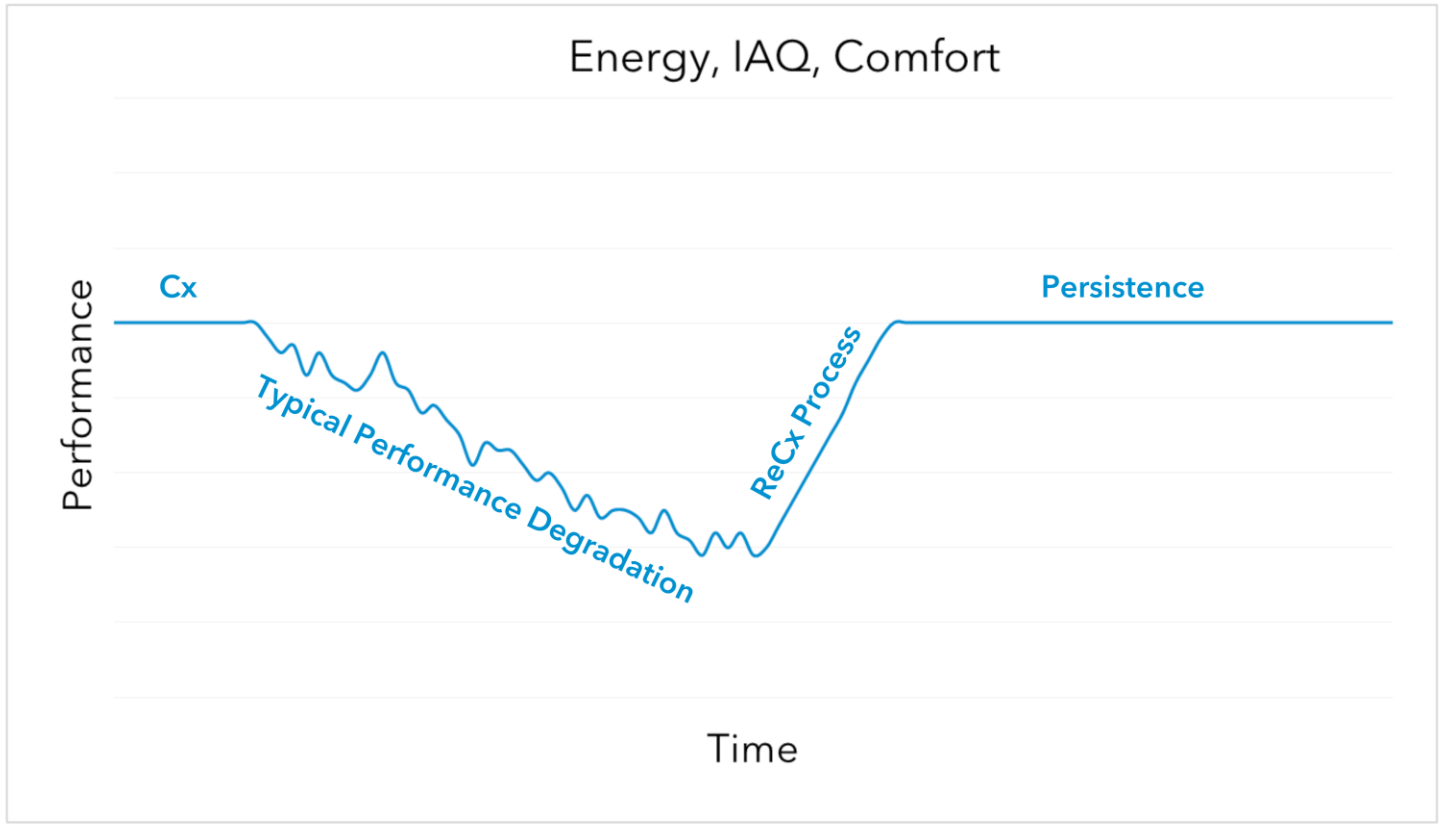
Why ReCx Matters?



Low Cost/High ROI Process to:

- Improve Comfort, Indoor Air Quality (IAQ), Humidity Management
- Energy Usage and Cost Savings
- Improved Tenant Retention
- Equipment Longevity
- Meet Sustainability Targets
- Operations & Management (O&M) Team training

The Recommissioning Process



Planning / Assessment

Investigation

Implementation / Verification

Turnover

Ongoing Cx / Persistence Phase

Planning/ Assessment

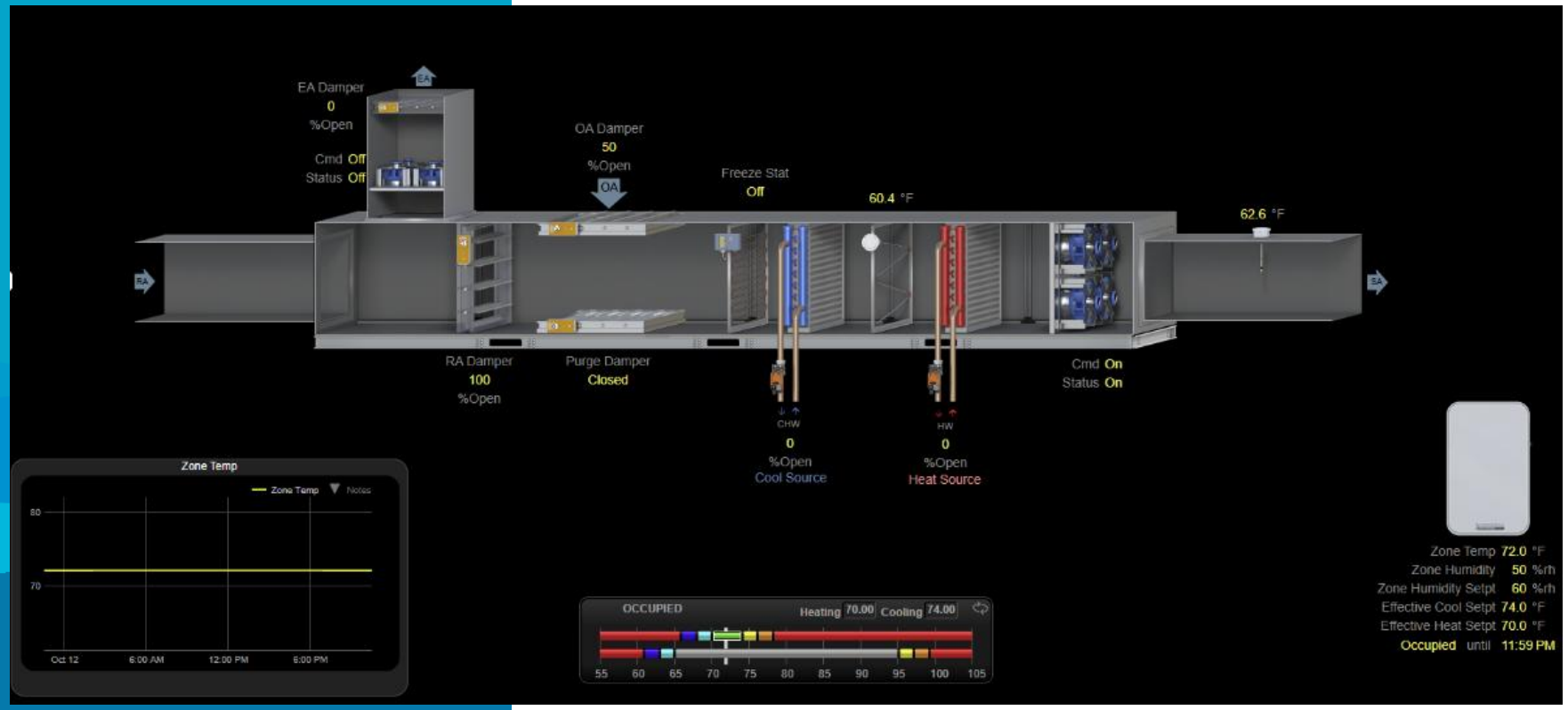
- Set goals & objectives.
- Build the ReCx team.
- Identify buildings with the greatest opportunity.
- Interview operators.
- Review/update past documentation.
- Define project & facility requirements.
- Develop functional test plans.
- Develop ReCx plan (scope, roles, schedule, training, M&V).

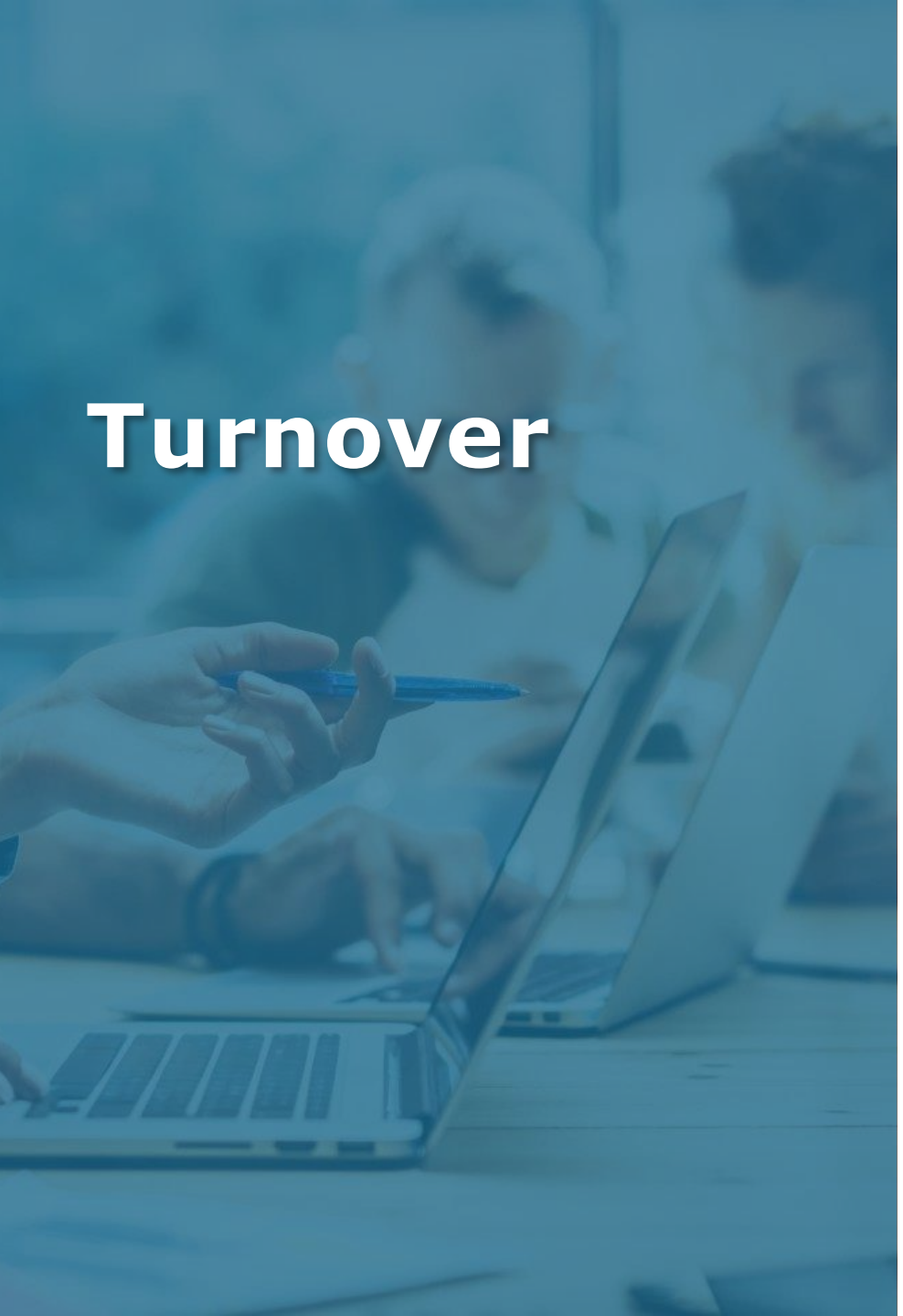
Investigation

- Assessment Data Review
- Utility Analysis
- Walkthroughs
- Functional Tests
- Trend Review
- Diagnostics
- Cost Estimates
- Planning & Prioritization

Implementation & Verification

- Implement the measures that meet ROI criteria.
- Commission/Verify/Test implemented measures.
- Execute on the measurement and verification plan developed in the ReCx plan.
- Engage O&M Personnel throughout.





Turnover

- Clear, accessible documentation
- O&M staff ready for transition
- Controls set for trends and alarms

Ongoing Cx / Persistence Phase

- Monitor dashboards, alarms, trends
- Document, document, document
- Build proactive maintenance culture

Common Findings

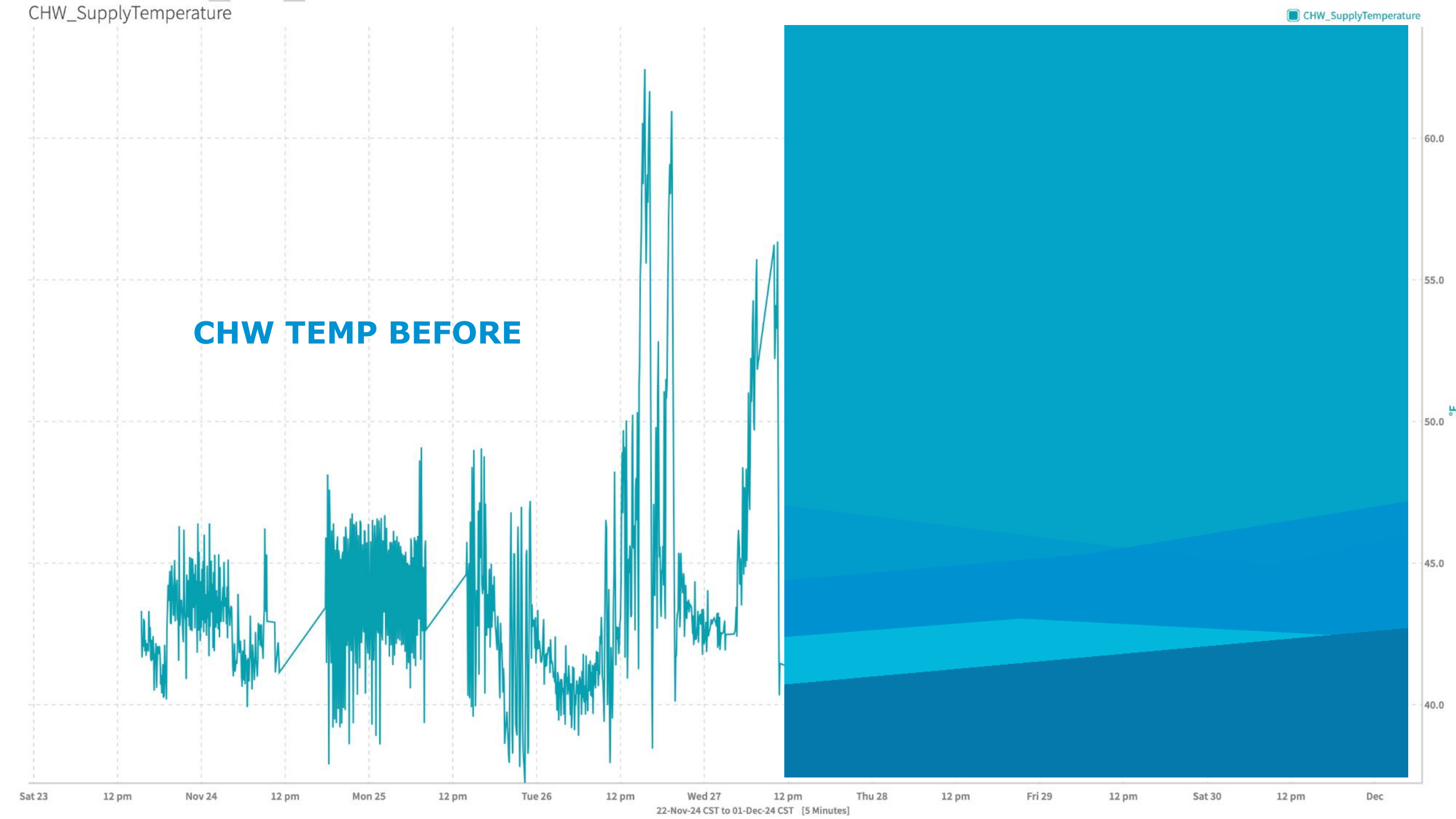
Common Findings

- Simultaneous heating & cooling
- Faulty or uncalibrated sensors
- Leaky dampers/valves
- Manual overrides of equipment
- Schedule misalignment
- Constant volume operation
- Failed lighting sensors
- Ventilation imbalance
- Misconfigured dehumidification controls
- Disabled efficiency equipment

Case Study

60,000 SF Laboratory Building (Texas, 2018)

- **Investigation Trigger:** Persistent operational issues in 2022
- **Key Findings:**
  - Pressure imbalances between lab/ non-lab spaces
  - Temperature fluctuations (chillers short cycling, failed sensors/valves)
  - Slow responding startup/shutdown exhaust and makeup air sequences
  - Control valve leaks, increasing airflow demand
  - Fire damper and actuator failures
  - Door/Air lock infiltration concerns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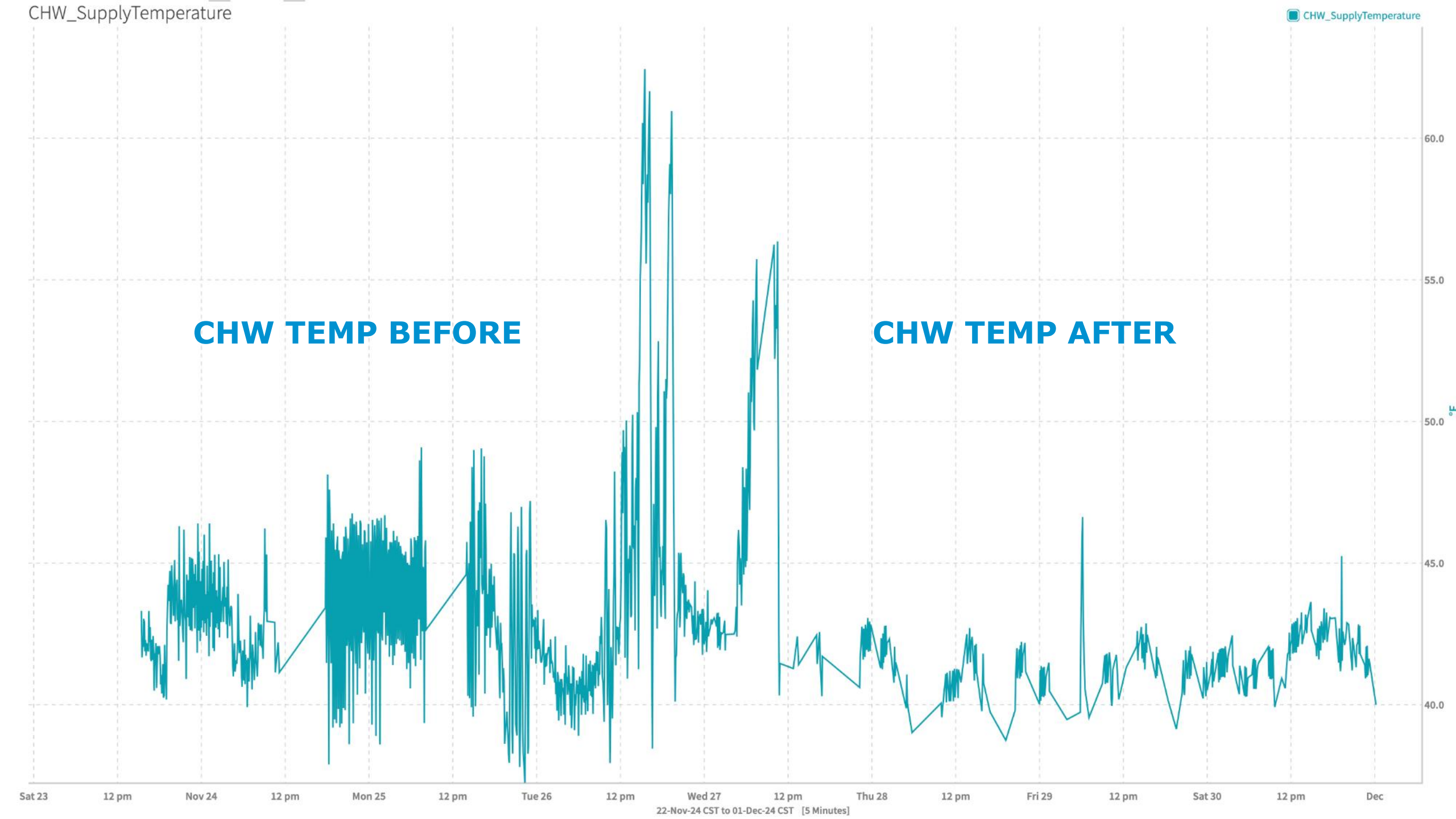
Dec
22-Nov-24 CST to 01-Dec-24 CST [5 Minutes]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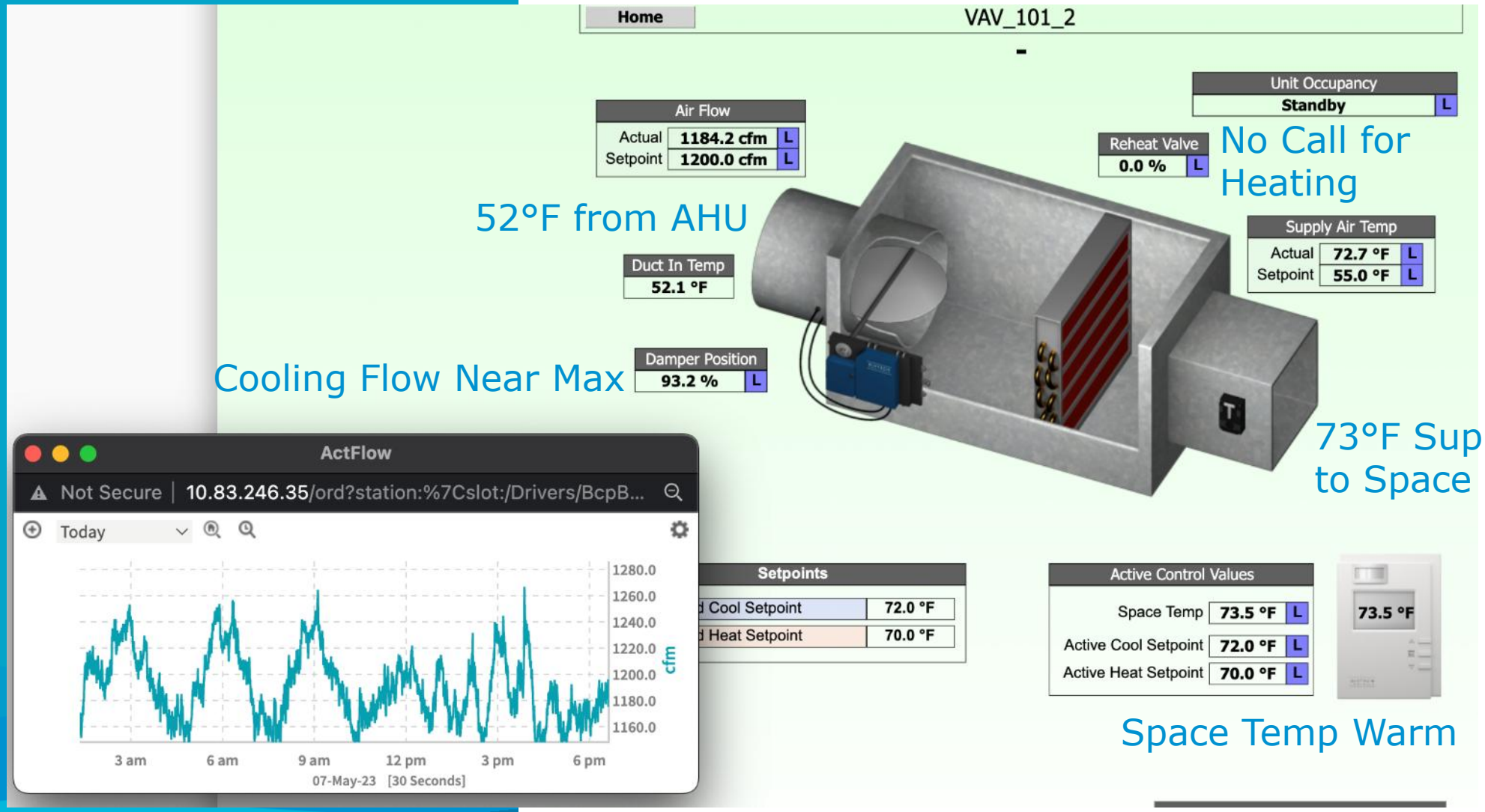
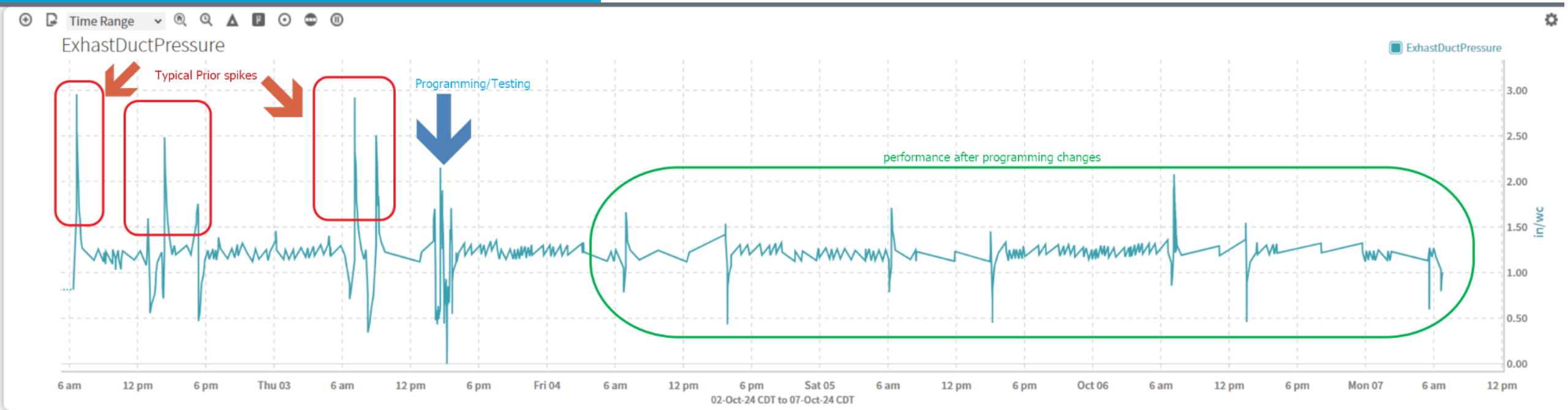


VAV Terminal with HW Valve commanded closed yet is still heating air. Approaching MAX cooling.

Building pressure peaks/troughs before and after retuned startup sequencing



Costs, Savings, and ROI

Costs, Savings and Return on Investment

- **Typical Cost:** $0.25–$0.60/ft² (depending on complexity/testing level)
- **High End:** Hospitals, Labs, Large Campuses
- **Low End:** Offices and Schools
- **Typical Payback:** 1-3 years
- **Typical Energy Savings:** 5-15%
- **Utility Incentives:** Many programs cover 25-75% of eligible Re-Cx Costs
- **Additional Benefits:** Improved comfort, reliability, and extended equipment life
- **Bottom Line:** One of the most cost-effective ways to boost performance and control operating costs

Building Resilience & Futureproofing

Building Resilience and Futureproofing

- RCx finds weak points before failure.
- Adapts buildings to new usage patterns (e.g., hybrid work).
- Supports decarbonization and load management.
- Optimizes performance for longer equipment life.
- Can include critical infrastructure testing and equipment safety feature testing to demonstrate system capabilities to protect the building, its equipment, and occupants from outside shocks.

Implementation Tips for Owners

Making ReCx Successful

- Screen Building Portfolio
- Select a Qualified and Trusted Provider
- Budget for Fees and Fixes
- Set Realistic Goals and Timelines
- Engage O&M Staff Early
- Leverage Data and Stay Persistent
- Frame It as a Risk Management Strategy

Key Takeaways

Key Takeaways

- Recommissioning = building performance tune-up
- High ROI through energy, comfort, and reliability improvements
- Strengthens resilience and sustainability goals
- Builds a culture of operational excellence

Thank You!

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