



CampusEnergy2019

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Using an Intelligent Predictive Maintenance Tool for Detecting and Predicting Equipment Failures

SPEAKERS

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Texas at Austin

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WHAT WE'LL COVER

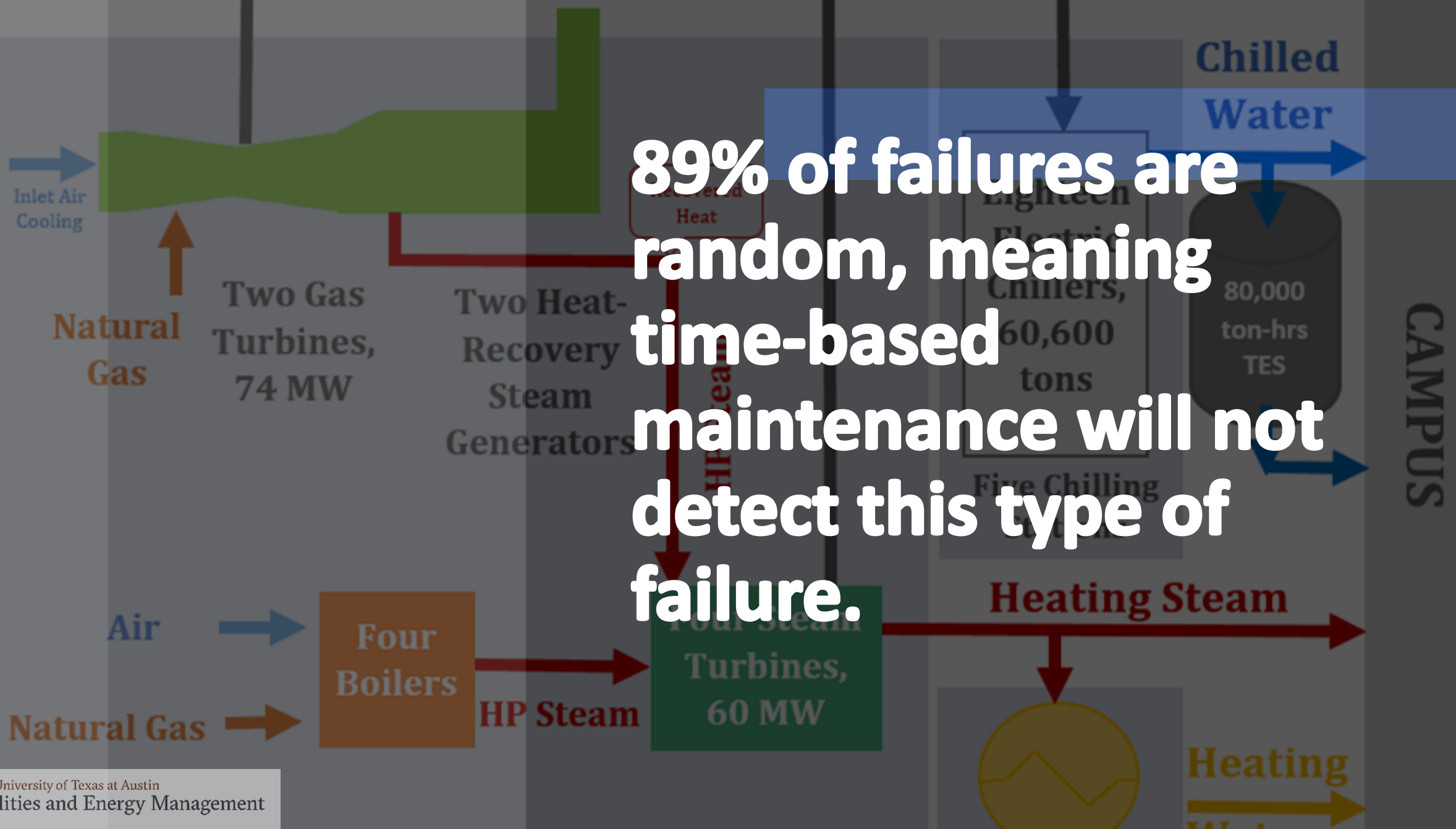
1 UT-Austin's implementation

2 Impact of potential & hidden failures

3 Value of a predictive maintenance tool



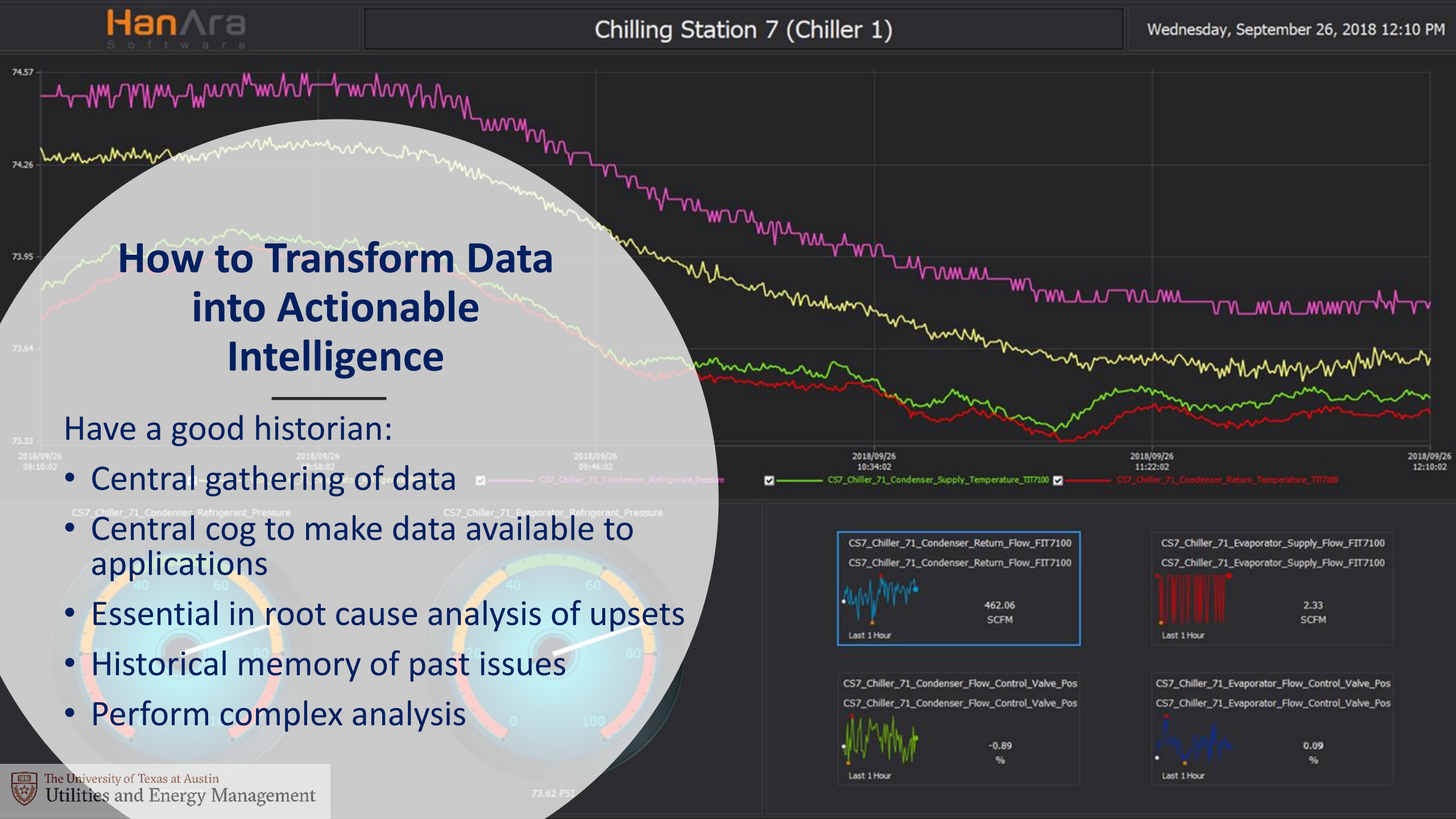
89% of failures are random, meaning time-based maintenance will not detect this type of failure.



How to Transform Data into Actionable Intelligence

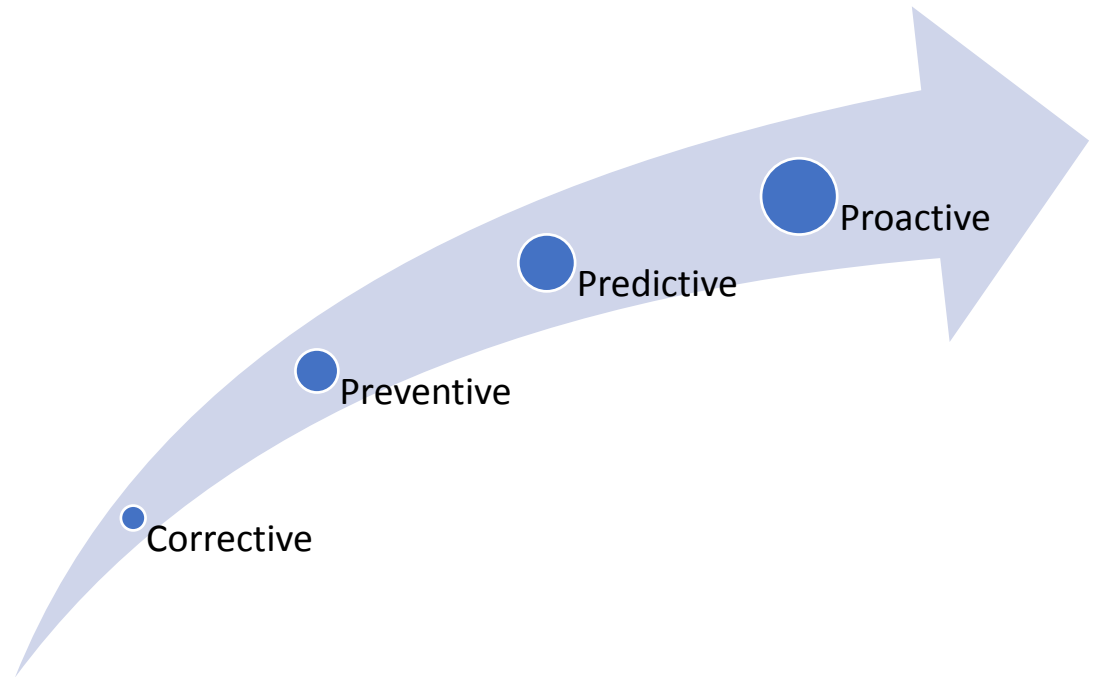
Have a good historian:

- Central gathering of data
- Central cog to make data available to applications
- Essential in root cause analysis of upsets
- Historical memory of past issues
- Perform complex analysis

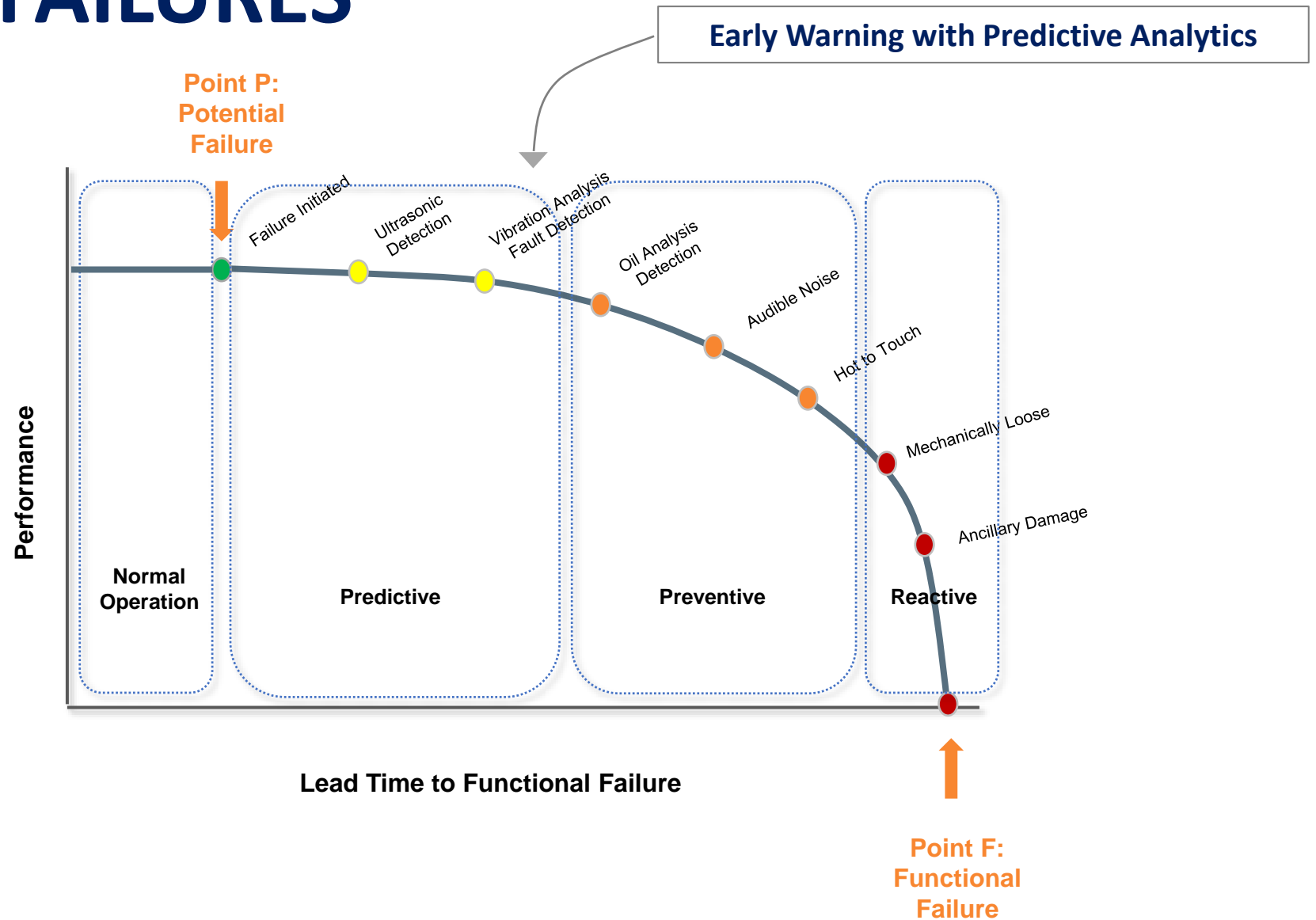


FUTURE OF MAINTENANCE

- Reduce non-productive time/downtime
- Increase labor efficiency
- Increase plant safety
- Reduce equipment cost



DETECTING FAILURES



UT-AUSTIN ADOPTION



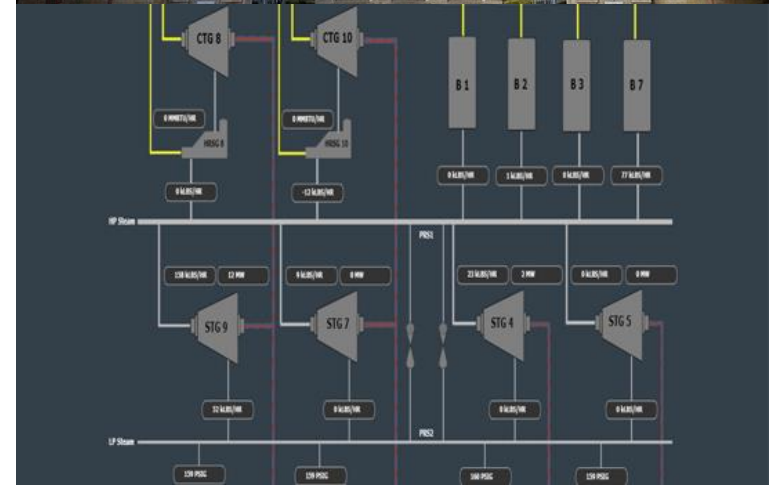
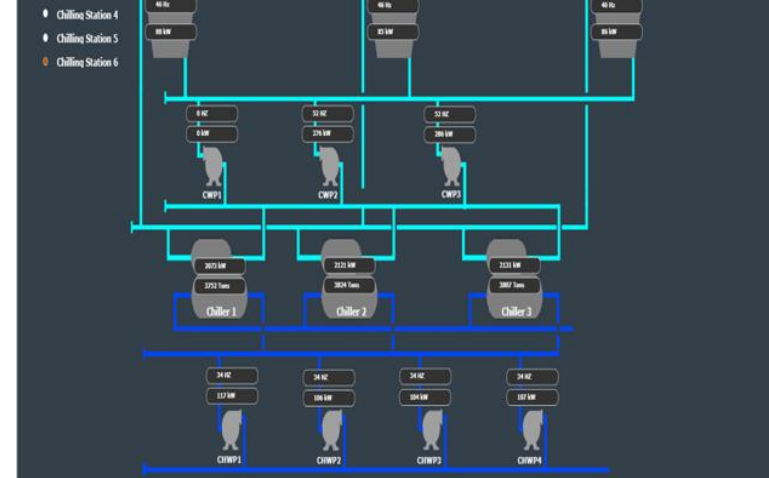
2012: Power



2018: Chillers



Detect hidden failures in advance



REASON FOR ADOPTION

Help in achieving goal of providing uninterrupted and cost effective power supply for university campus

Reduce unnecessary maintenance activities

Improve stability and performance and increase reliability

THE SOLUTION HanPHI



Designs empirical models with fault-free, historical normal operation data of plant and groups correlated equipment signals



Measures discrepancies between the real-time operating condition and predicted operating condition with the prediction models



Provides early warning before any discrepancies and indicates them as a percentage (plant's health condition)





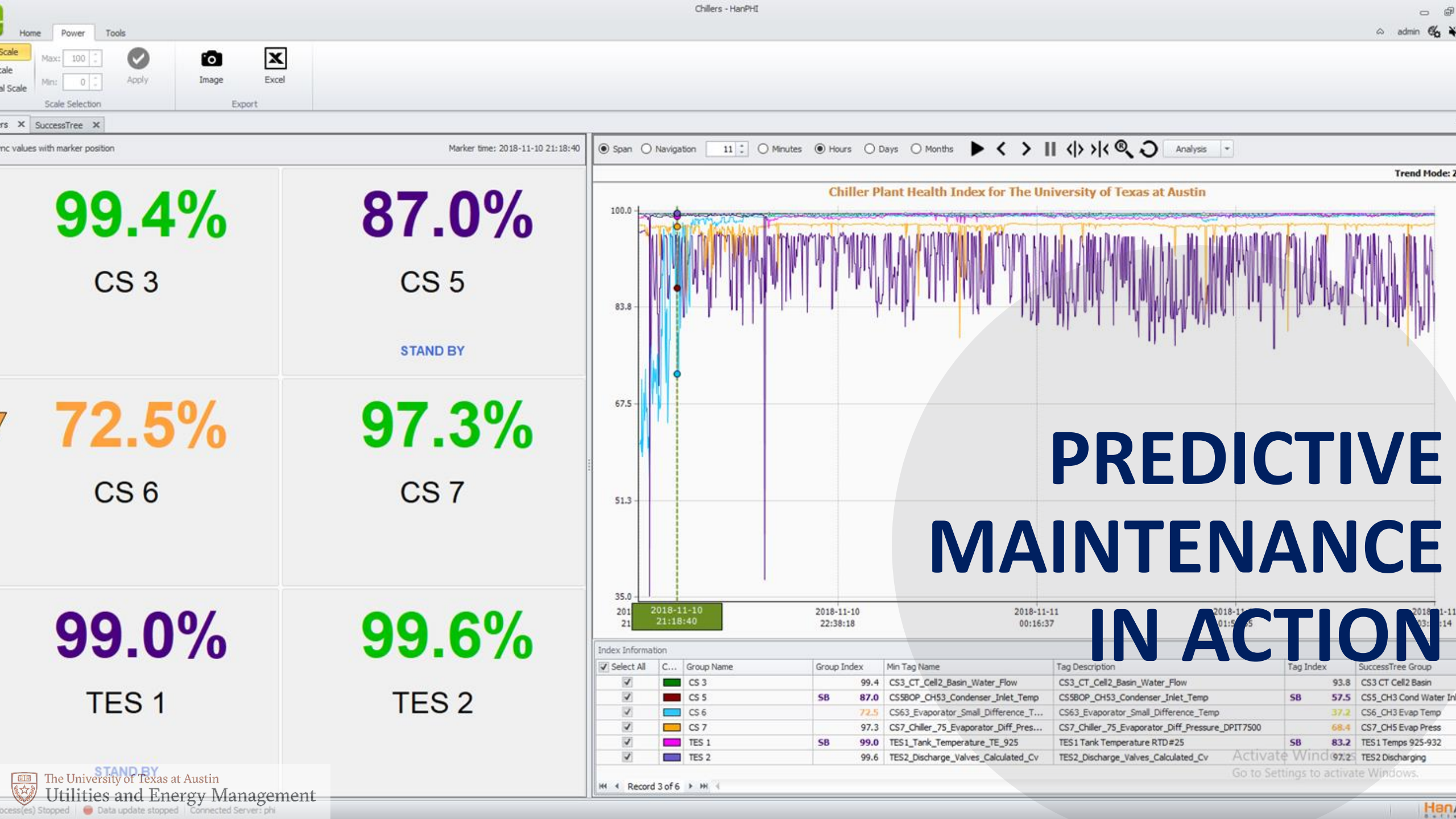
PREDICTIVE MONITORING

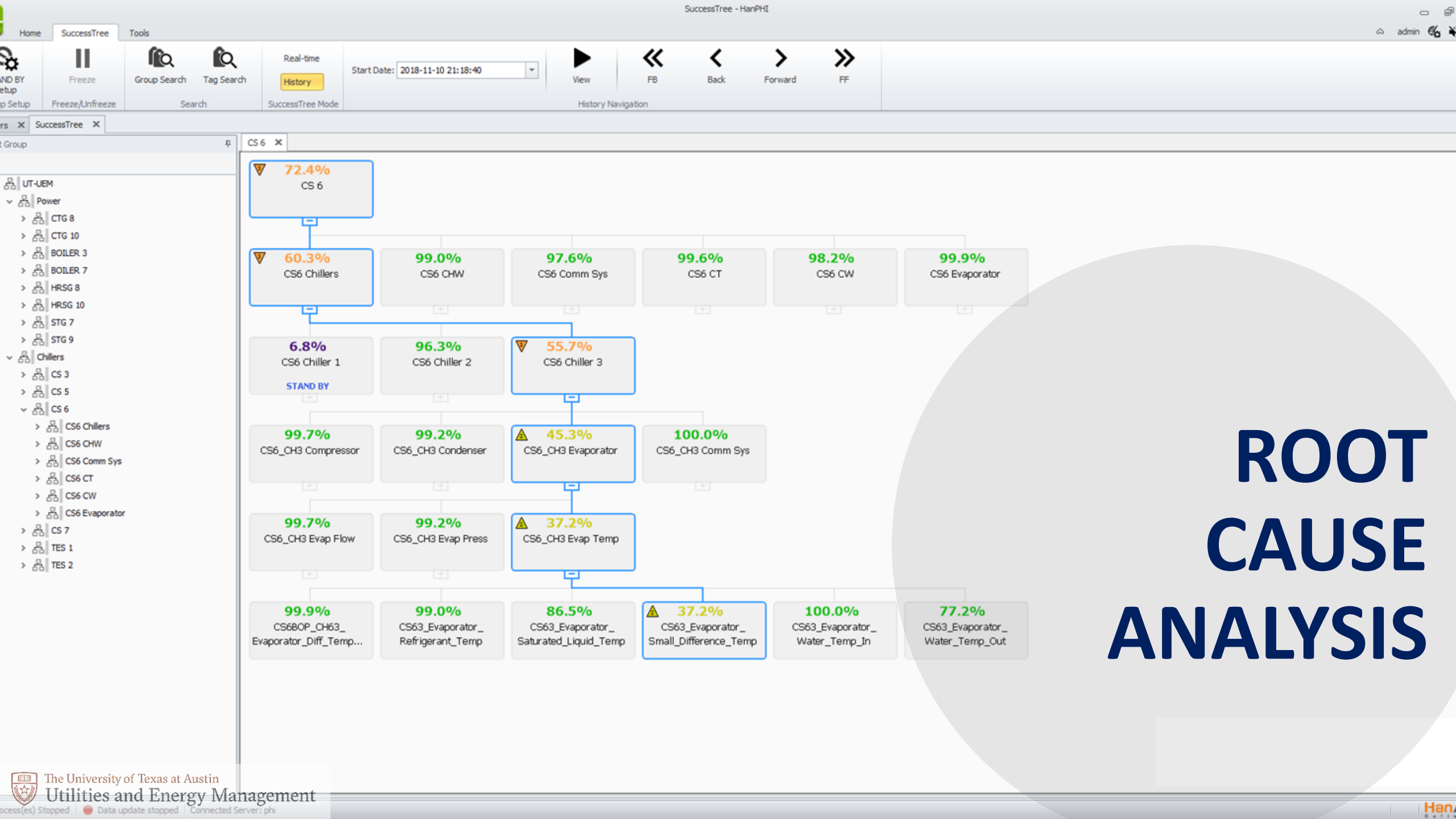
Identification

- Sensor failure
- Potential equipment failure
- Process failure

Value Creation

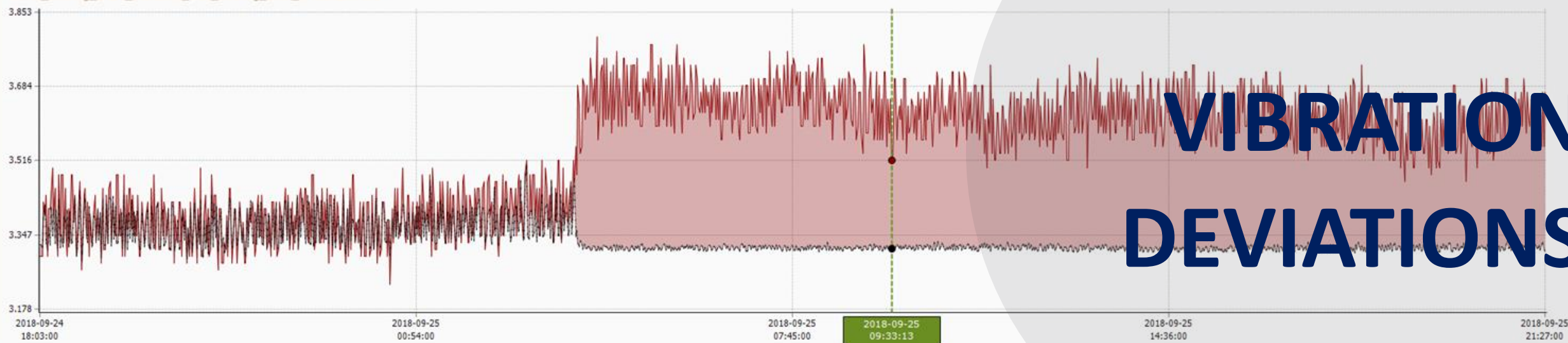
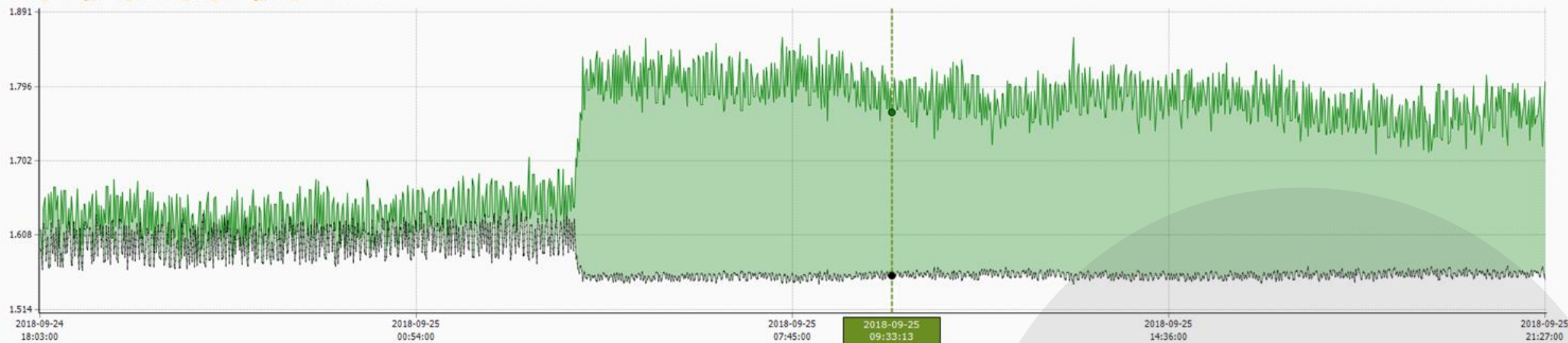
- Improve stability of sensors
- Improve stability of equipment
- Improve availability and reliability of the plant





ROOT CAUSE ANALYSIS

Trend Mode: Zoom



VIBRATION DEVIATIONS

<input checked="" type="checkbox"/> Select All	Color	Tag Name	Description	Low	High	Actual 1	Expected 1	Residual 1	Index 1	Unit
<input checked="" type="checkbox"/>		STG9 Bearing_Shift_Vibr...	T9 SHAFT VIBRATION GEN BEARING REAR		0.00	15.75	1.76	1.56	-0.21	40.4 MILS
<input checked="" type="checkbox"/>		STG9 Bearing_Shift_Vibr...	T9 SHAFT VIBRATION GEN BEARING REAR		0.00	15.75	3.52	3.32	-0.20	86.7 MILS

NEXT STEPS



Continue to operationalize



Standardize on historian



Access remotely





The University of Texas at Austin

Utilities and Energy Management

QUESTIONS

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Texas at Austin**

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