

Fault Detection and Diagnostics Initiative Update

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Fault Detection and Diagnostics

What is it?

Fault Detection and Diagnostics (**FDD**) is a software tool...

used to **PROACTIVELY** discover building system problems and identify optimization opportunities...



BEFORE they lead to alarms, excessive waste of resources, occupant discomfort or system failure.

Fault Detection and Diagnostics

Buildings currently in scope

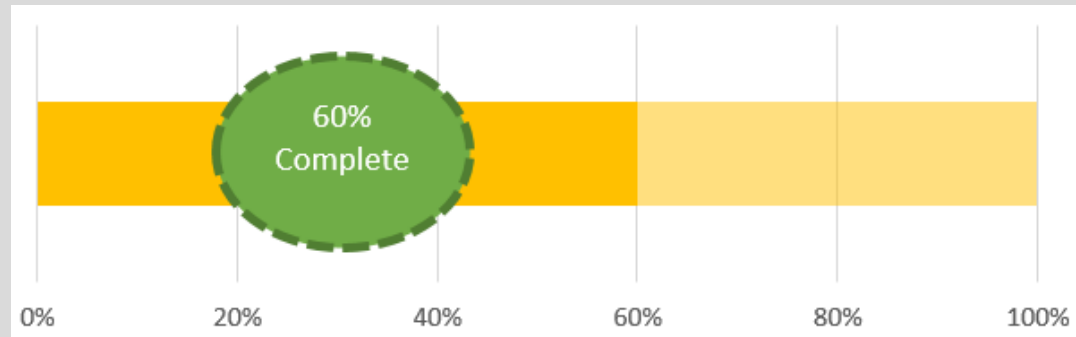
| | | | |
|---|-----------------------|-----------------------------------|---------------------------------------|
| College of Medicine Administration Building | Biology Building East | Adler Journalism Building | Campus Recreation and Wellness Center |
| College of Public Health Building | Blank Honors Center | Boyd Law Building | Chemistry Building |
| Pappajohn Biomedical Discovery Building | Voxman Music Building | Spence Laboratories of Psychology | Pomerantz Center |
| Dental Science Building | Hancher Auditorium | University Services Building | Trowbridge Hall |
| Carver Biomedical Research Building | Stuit Hall | Medical Laboratory | Calvin Hall |

Fault Detection and Diagnostics

On-boarding Quick Metrics

Initiative Start Date

2/23/2017



Warranty Items Identified

35

Hancher Auditorium

Number of Diagnostics Running

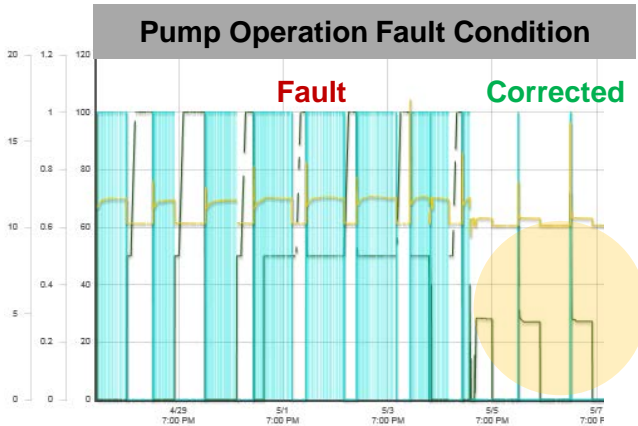
6,669

FDD Work Orders Generated

180

Blank Honors Center

“Quick Win”

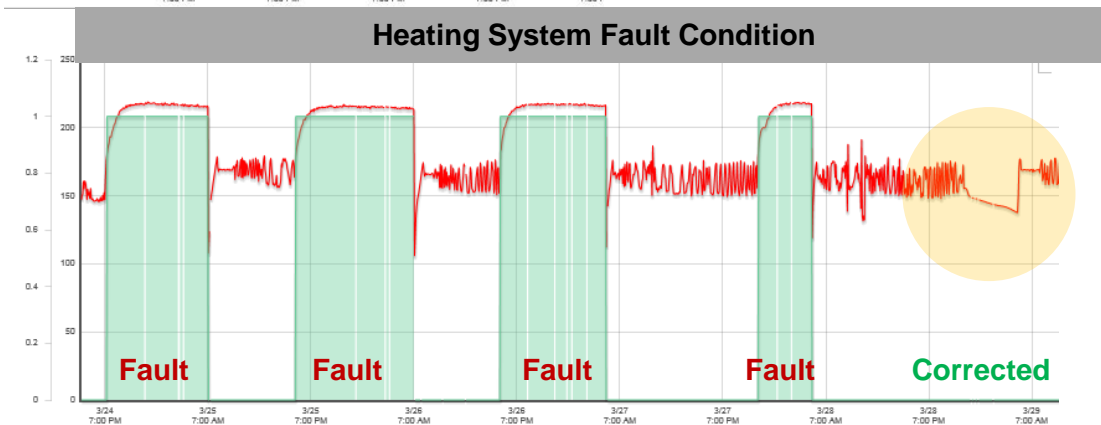


Issues Identified

- Heating system discharging higher temperature water than required
- **Only occurring when building unoccupied** and minimal call for heat

Findings

- Faulty valve was causing steam to leak by & **overheat** system
- Pumps were overshooting setpoint & **wasting energy**
- Faulty pressure sensor was causing **poor performance**



Hancher and Voxman Commissioning Benefits

601 data records found for 5/22/2017 to 5/22/2017 in daily intervals.

[Download Full Diagnostics Results](#)

| Building | Equipment | Analysis | Start Date | Notes Summary | Tasks | Cost | E | C | M | Actions |
|------------------------|---|----------------|------------|---|-------|------|----|----|---|---------|
| Voxman School of Music | AHU 05 (Air Handler) | AHU Economizer | 5/22/2017 | Excess mechanical cooling. Insufficient economizing. OA Damper should be max. | 0 | \$34 | 10 | 0 | 6 | ✓ |
| Voxman School of Music | ERU 01 | AHU Coils | 5/22/2017 | Excess cooling. Valve short cycling | 0 | \$18 | 7 | 1 | 3 | ✓ |
| Voxman School of Music | | | | | 0 | \$10 | 4 | 1 | 1 | ✓ |
| Voxman School of Music | | | | | 0 | \$8 | 3 | 0 | 0 | ✓ |
| Voxman School of Music | | | | | 0 | \$6 | 2 | 0 | 0 | ✓ |
| Voxman School of Music | | | | and heat wheel info available (see | 0 | \$4 | 2 | 0 | 5 | ✓ |
| Voxman School of Music | | | | was zero. Fan short | 0 | \$4 | 2 | 0 | 4 | ✓ |
| Voxman School of Music | BCU-08_Rm 5200 (Zone Equipment) | Zone Unit | 5/22/2017 | Supply temp lower than setpoint while cooling on. Stuck cooling valve. Room temp setpoint is low. | 0 | \$0 | 0 | 10 | 4 | ✓ |
| Voxman School of Music | Rm X3000_SVAV-A6-X3000 (Zone Equipment) | Zone Unit | 5/22/2017 | Supply flow lower than setpoint. Heating and cooling setpoints close together. | 0 | \$0 | 0 | 10 | 2 | ✓ |
| Voxman School of Music | EVAV E1-L2-3_EVAV-E1-L... (Zone Equipment) | Zone Unit | 5/22/2017 | Exhaust flow lower than setpoint. Setpoint was zero. | 0 | \$0 | 0 | 10 | 2 | ✓ |
| Voxman School of Music | Rm 1400Q_ACB-E1-1400Q (Zone Equipment) | Zone Unit | 5/22/2017 | Room air temp higher than setpoint. Heating and cooling setpoints close together. Leaky heating valve. Slow room air temp response to conditioning. Stuck | 0 | \$0 | 1 | 7 | 4 | ✓ |

New Construction Buildings Under Warranty

- Submit punchlist items directly from the tool
- Many issues at Voxman are zone-level programming issues, which are difficult to catch during commissioning



Fault Detection and Diagnostics

Next Steps

- Incorporate the tool within our normal workflow
- Measure results to determine impact
- Onboard future buildings upon successful implementation

Questions?

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