Are Dirty Coils Putting Pressure on Your Budget?

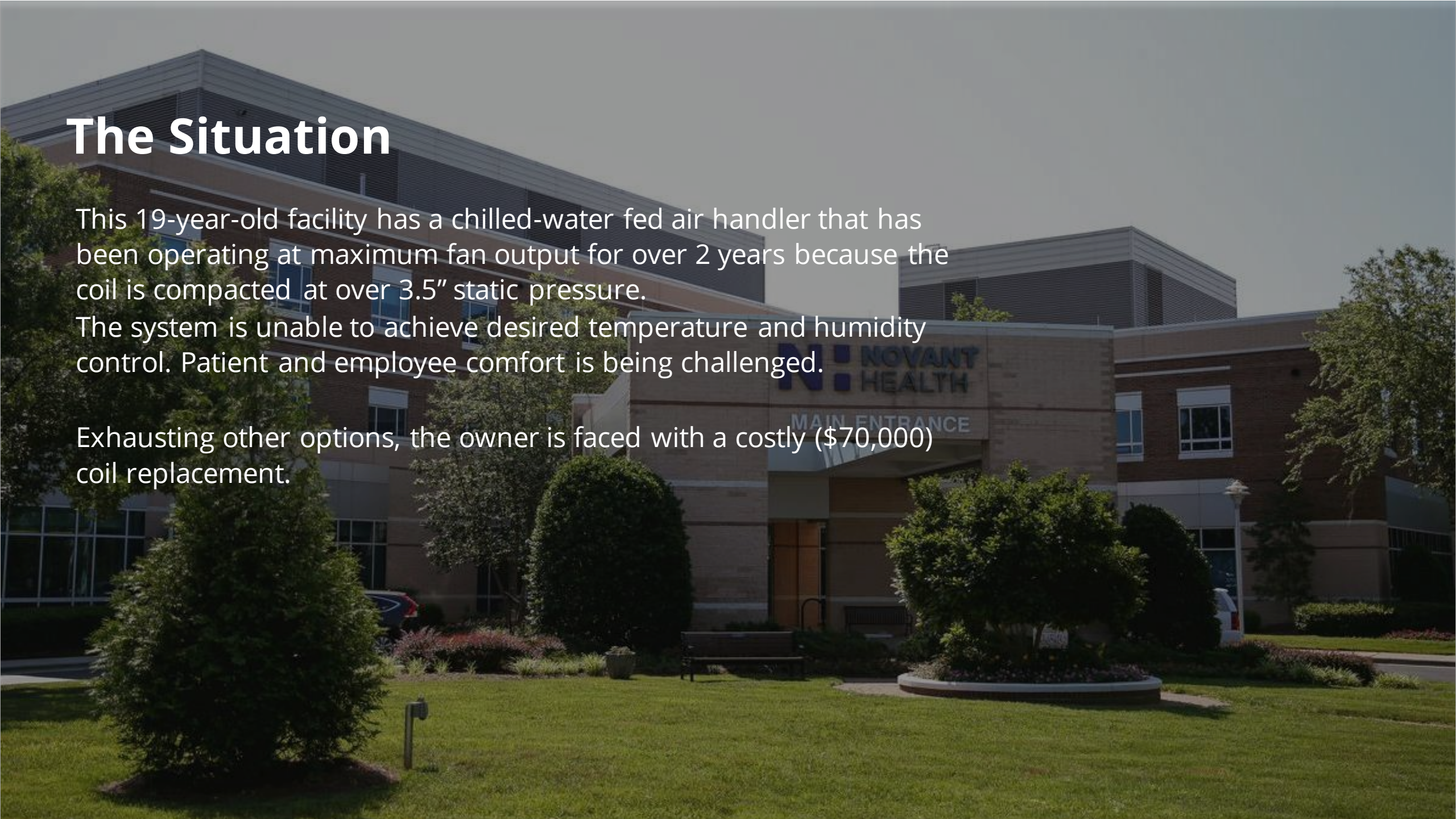
GPS-iMod® Coil Efficiency Platform

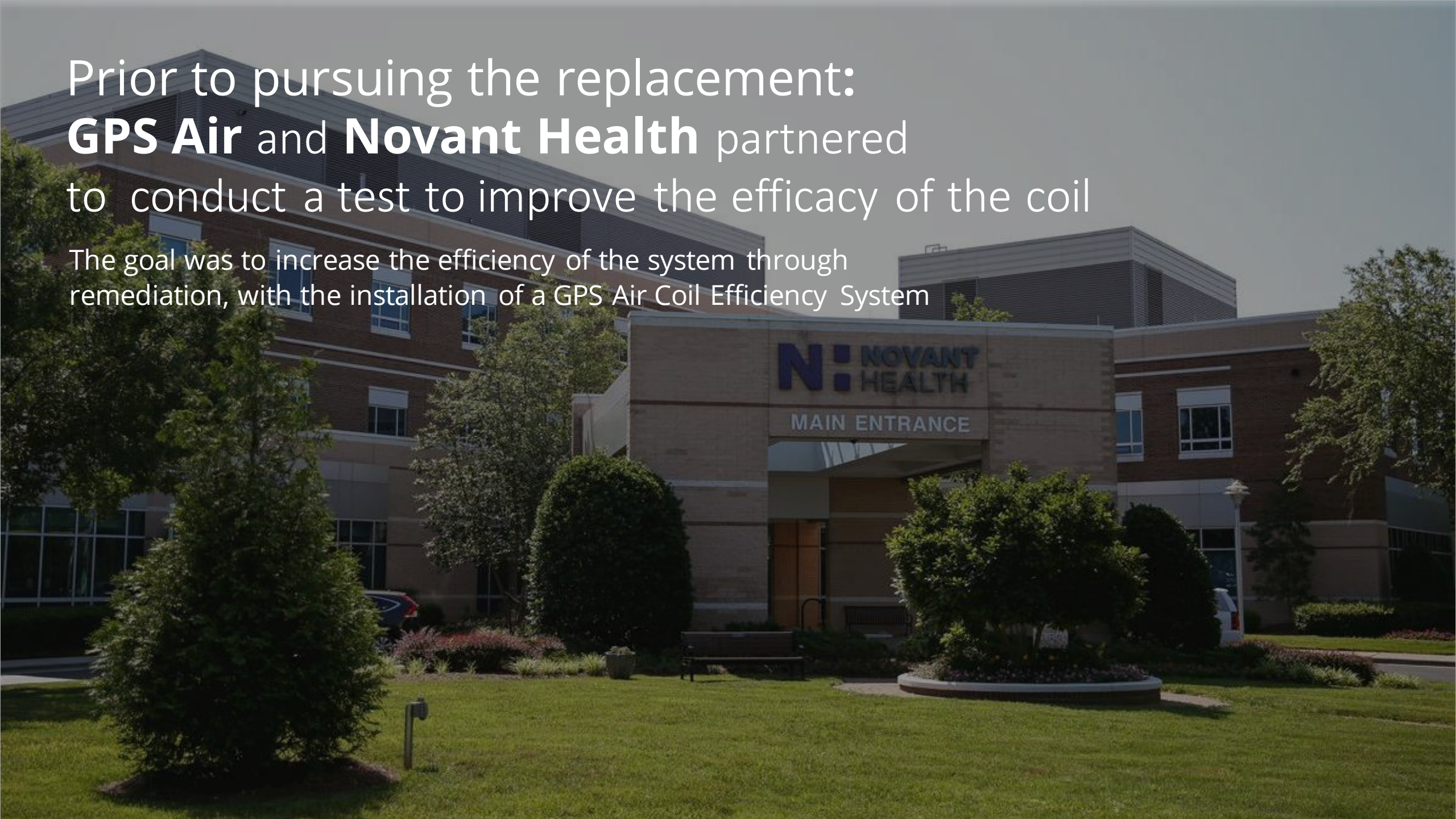
Through ionization, the iMod inhibits bacteria and mold growth on air handler coils. iMod's bio-guard performance keeps a new coil clean longer or cleanses existing coils; saving energy through efficient heat transfer and reduced static pressure across the coil. This lowers fan power and other HVAC equipment stress (e.g. chiller pumps, compressors, etc.).

The Situation

This 19-year-old facility has a chilled-water fed air handler that has been operating at maximum fan output for over 2 years because the coil is compacted at over 3.5” static pressure.
The system is unable to achieve desired temperature and humidity control. Patient and employee comfort is being challenged.

Exhausting other options, the owner is faced with a costly ($70,000) coil replacement.





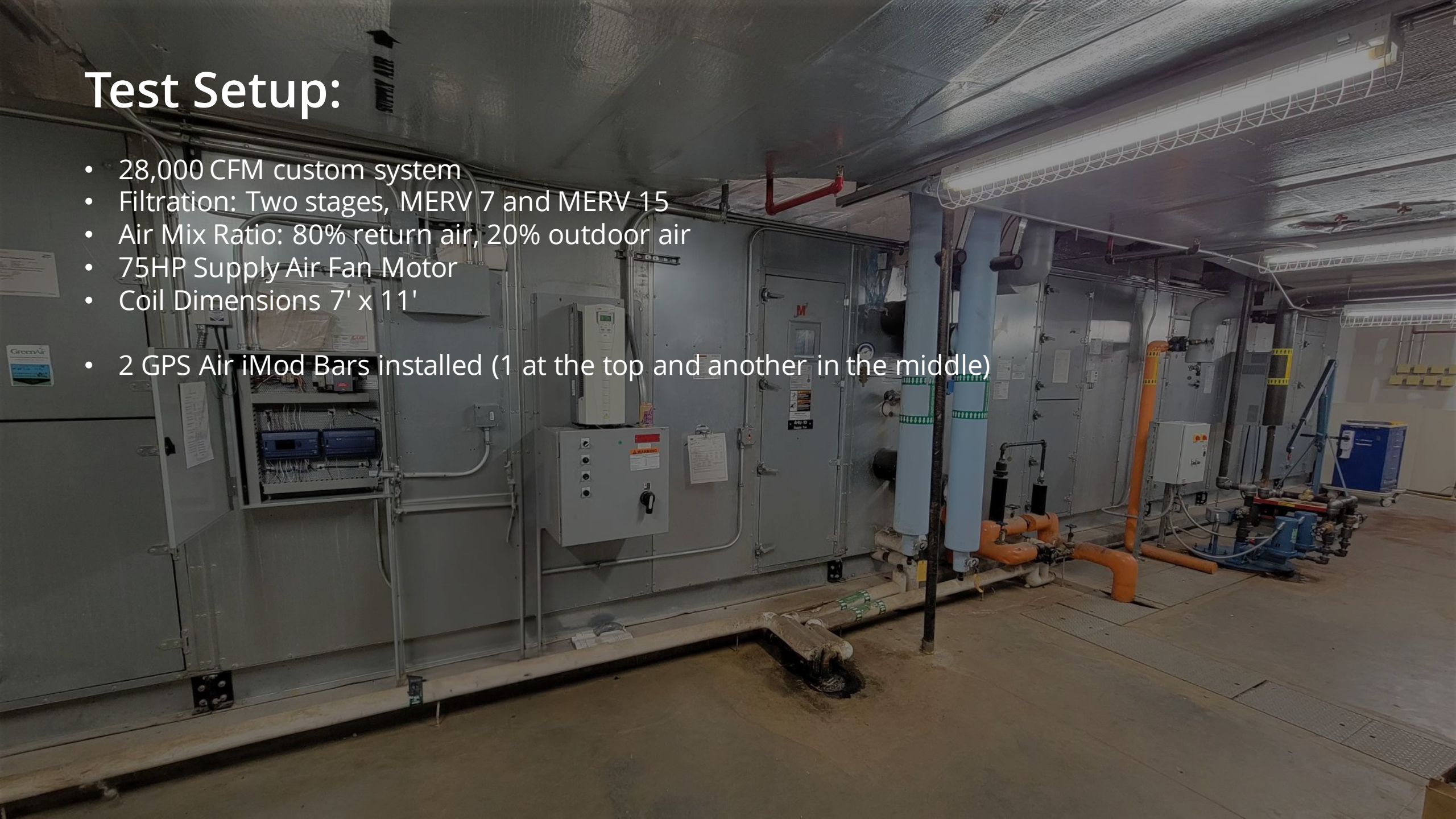
Prior to pursuing the replacement: **GPS Air** and **Novant Health** partnered to conduct a test to improve the efficacy of the coil

The goal was to increase the efficiency of the system through remediation, with the installation of a GPS Air Coil Efficiency System

Test Setup:

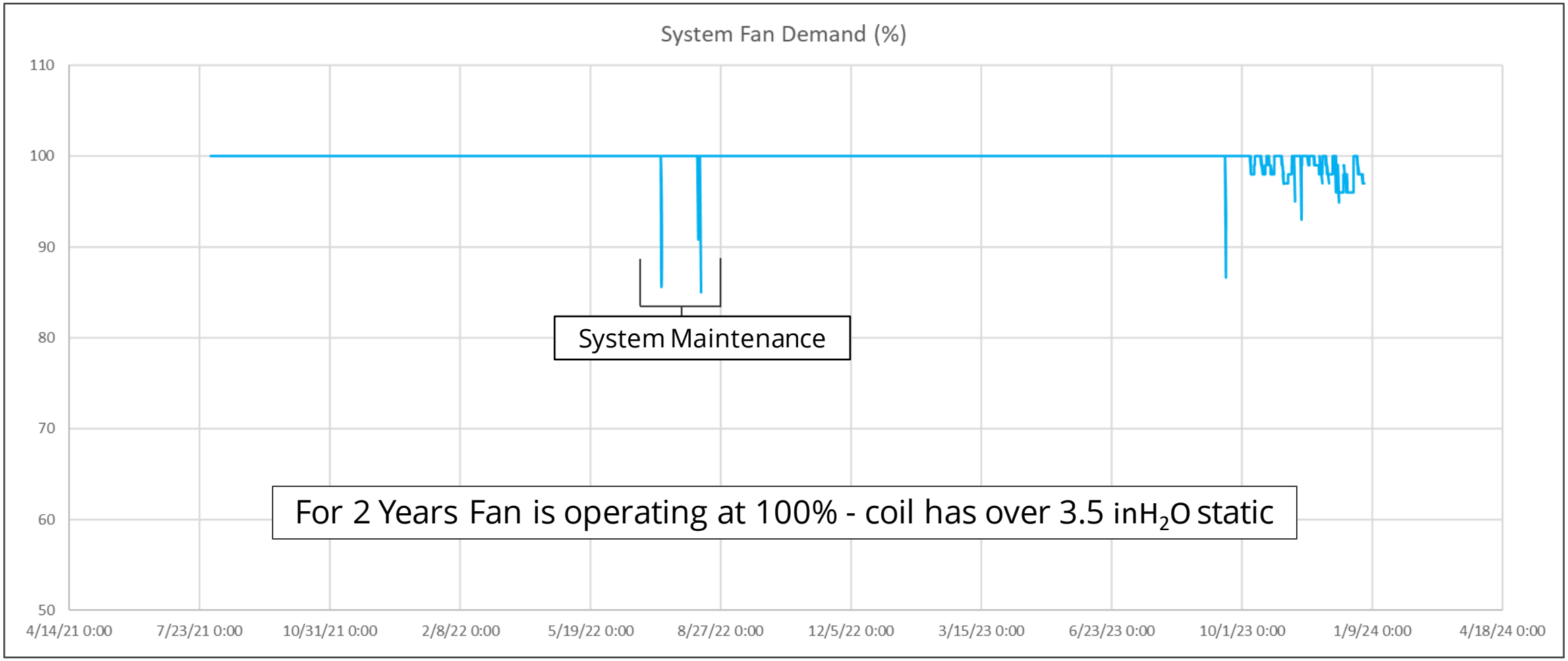
- 28,000 CFM custom system
- Filtration: Two stages, MERV 7 and MERV 15
- Air Mix Ratio: 80% return air, 20% outdoor air
- 75HP Supply Air Fan Motor
- Coil Dimensions 7' x 11'

- 2 GPS Air iMod Bars installed (1 at the top and another in the middle)



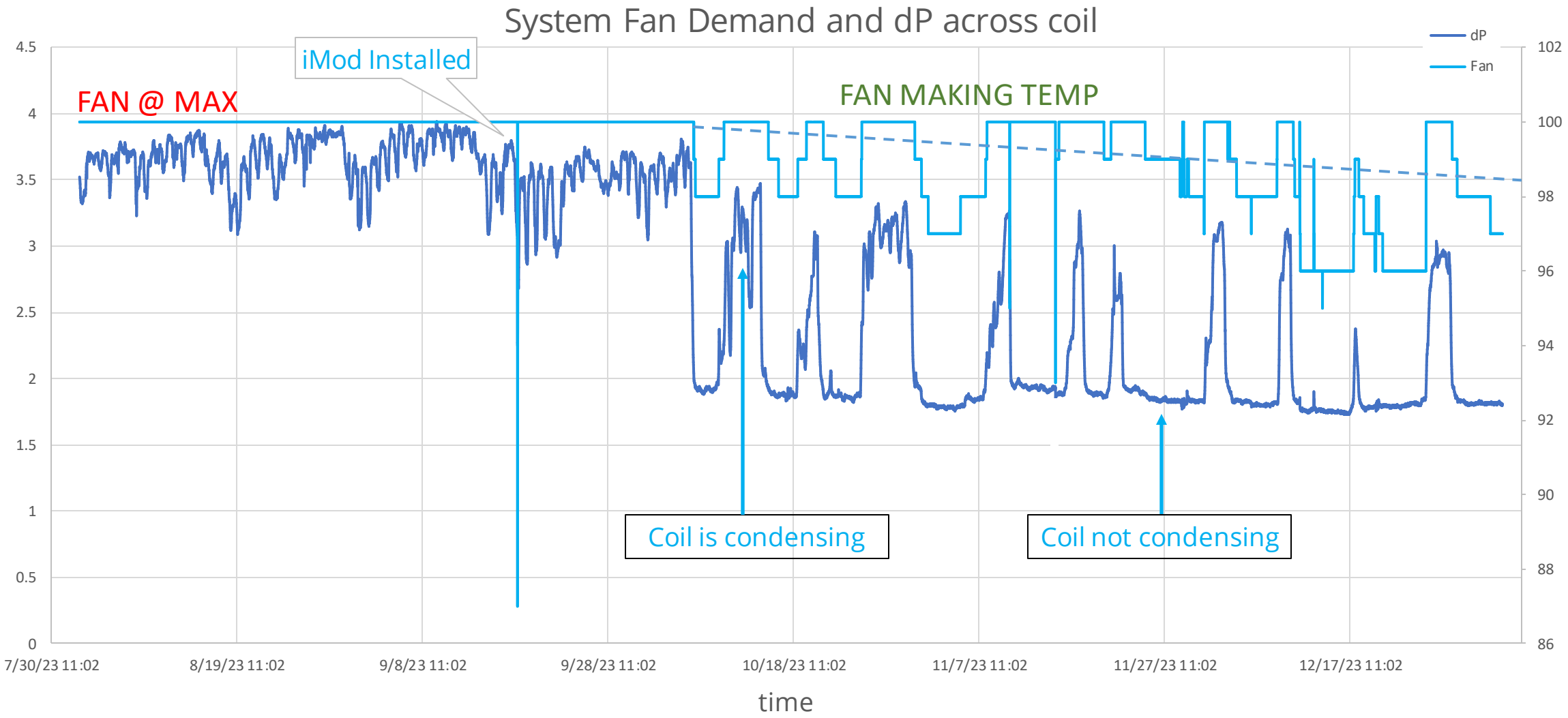
Pre-iMOD Efficiency Condition

- System fan demand (% of max) was used to determine if the coil heat transfer was restricting system performance
- For the 2 years prior to iMOD installation the system fan was operating at 100%, except during maintenance
- After iMod installation fan demand declined below max for the first time in 2 years



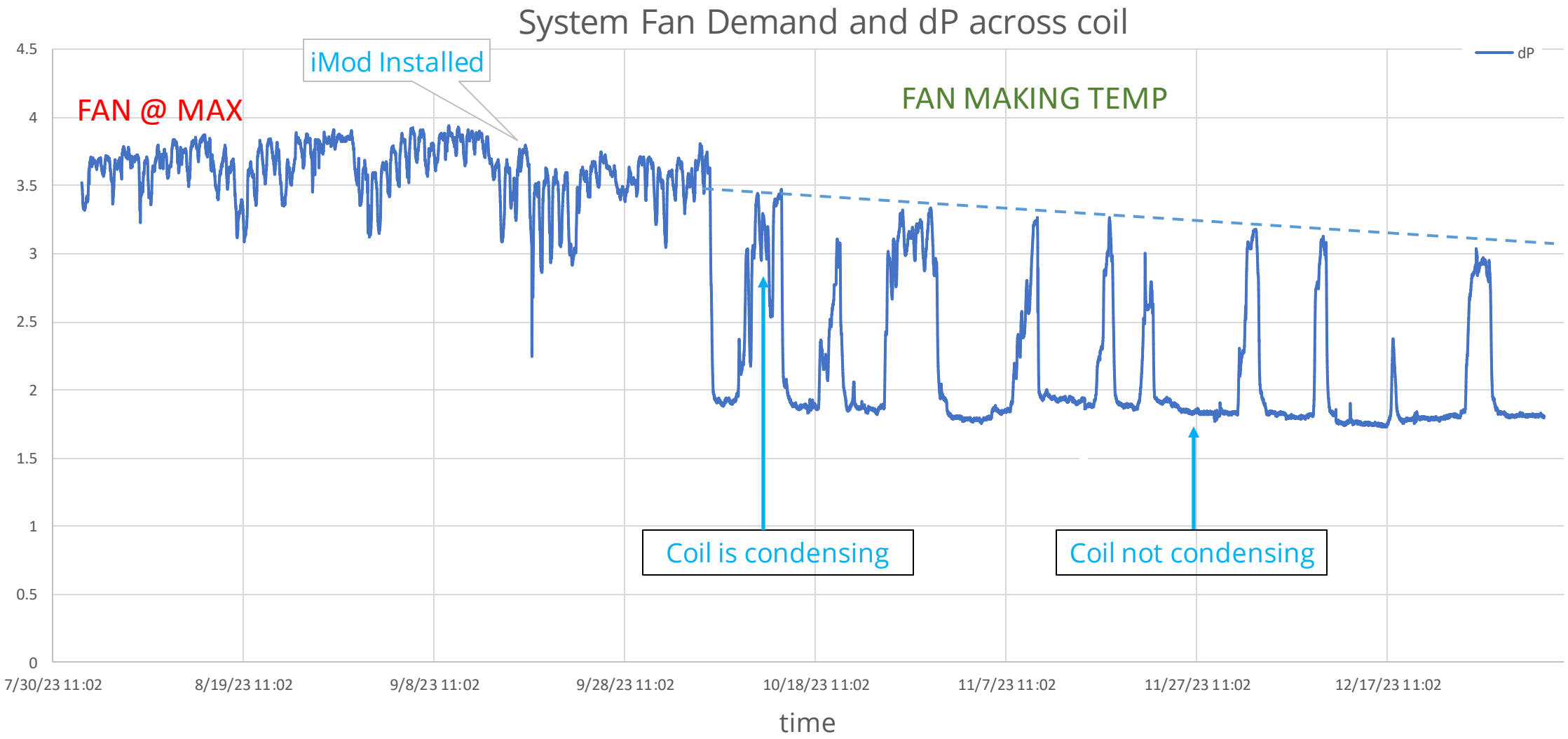
System Fan Demand with Differential Pressure Data

Taken together, the fan speed began to decline as both the maximum and minimum coil pressure drop began to decline. This indicates a reduction of static pressure due to the coil biofilm being reduced after the iMod was installed.



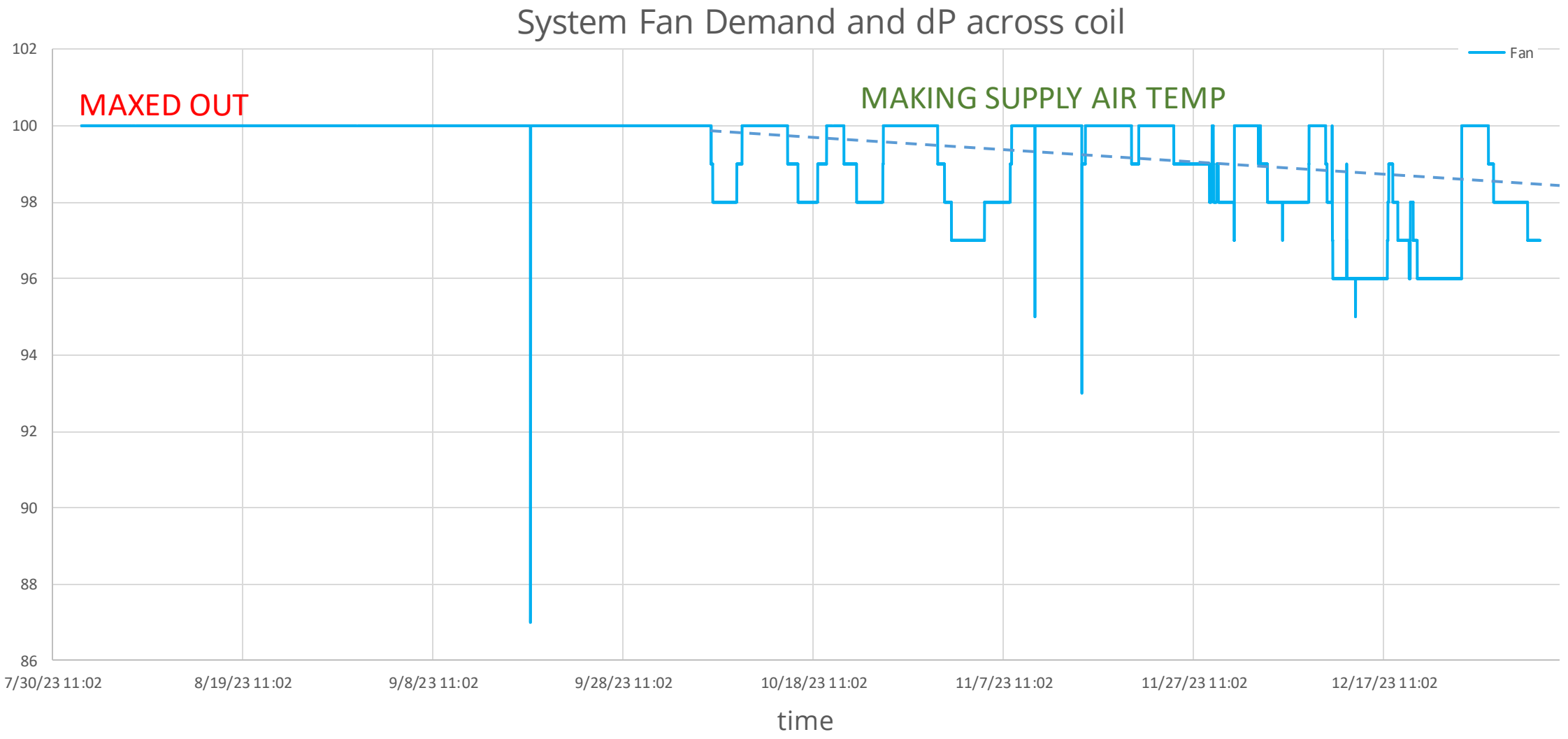
System Fan Demand with Differential Pressure Data

Isolating for pressure across the coil, it is clear a decline is occurring both in max and minimum pressure.



System Fan Demand with Differential Pressure Data

Fan operation is now averaging less than 98% and continuing to decline as the system is achieving temperature and humidity setpoints. This is a major improvement as the fan was at 100% for 2 years indicating it was never able to achieve the setpoint.



The numbers

AHU units of this size require an average investment of $19,000 for an iMod, installed. By avoiding a coil replacement, the payback is immediate.

Assuming the coil was not at end of life, the energy savings and deferred coil cleaning save over $9,000/year providing a 23-month payback

For this customer:

- Net energy savings is 60MWh per year, or $7,000/year
- Net carbon reduction of over 95,000 lbs. per year

iMod ROI Expected Results with Coil Efficiency

GPS Air iMod System ROI Calculator and Proposal Tool

INPUTS				
Project Name:	Novant Hospital			
	L		W	
Air Handler Dimensions	40	in.	132	in.
AHU Capacity:	28,000	cfm		
Starting Static:	3.5	in. w.g.		
Project Location:	North Carolina			
Average kWh rate:	0.112	$/kWh	Override?	No
Inflation (energy/labor)	3.0%			
Project hurdle rate:	10%	(time value of money)		
Operating Hours:	8,760	hours		

iMOD COIL EFFICIENCY RESULTS		
NPV iMOD:	$ 23,088	
Payback:	23	months
Annual Energy Savings:	80,777	kWh saved
Annual Carbon Savings:	126,259	lbs. CO_2 reduced

iMod by GPS Air

- NPBI technology, UL2998 certified
- 10 year expected life
- Low maintenance: isopropyl alcohol wipe 1/ year
- Also reduces hydrocarbon exhaust fumes

www.gpsair.com

Get More Out Of Your Air

rev. 1.0 -A Cash

iMod maintains lower static pressure, approximately 1.5" w.g. per year. This saves ~$7k in fan power annually. This also allows a ~$2k deferral in maintenance to every other year. It costs about $140/year to operate.

A $19k iMOD investment has a 5-year NPV of $23k and a payback of 23 months.

Key Project Parameters:

- 28,000 cfm air handler
- 24/7 operation
- $0.11/kWH
- 3% inflation rate on energy

iMod ROI Expected Results with Coil Efficiency

CASH FLOW ANALYSIS iMOD

	Full System ROI with iMOD						
	iMOD Operating Cost	0	1	2	3	4	5
	Equipment & Installation	19,600					
	Energy Consumption		30	31	32	33	34
	Maintenance Expense		103	106	109	113	116
(a)	Total Costs	$ 19,600	$ 133	$ 137	$ 141	$ 146	$ 150
	AHU Op Ex without iMOD (Current State)						
	Fan Energy at Current Static Pressure		15,832	16,782	17,257	17,732	18,207
	Annual Coil Cleaning Expense†		2,000	2,120	2,180	2,240	2,300
(b)	Total AHU Operating Expense		$ 17,832	$ 18,902	$ 19,437	$ 19,972	$ 20,507
	AHU Op Ex with IMOD (Future State)						
	Fan Energy after cleaning		6,785	6,989	6,989	6,989	6,989
	Annual Coil Cleaning Expense†		-	2,120	-	2,240	-
(c)	Total AHU Operating Expense		$ 6,785	$ 9,109	$ 6,989	$ 9,229	$ 6,989
	iMOD Deployment Cash Flow Analysis						
(d)	Project Benefits due to iMOD (c) - (b)		$ 11,047	$ 9,793	$ 12,448	$ 10,743	$ 13,518
(e)	iMOD Expense (a)	$ (19,600)	$ (133)	$ (137)	$ (141)	$ (146)	$ (150)
	Net Cash Flows (d) + (e)	**$ (19,600)**	**$ 10,914**	**$ 9,656**	**$ 12,307**	**$ 10,598**	**$ 13,369**
	Net Present Value (10% rate)	**$ 23,088**			Payback:	23 months	

* wipe the emitters down during a filter change

† Pays $2000/ year to chemically clean; will move cleaning to every other year

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Global Plasma Solutions