



Carbon Copy Operations

Gaining Back
Resolution Through O&M
Staff Benchmarking and Training



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hello



four

learning
objectives

assess your staff's **expertise** and **capabilities**

TO INSTALL TO REMOVE

! WARNING



Never jump onto or from a scaffold platform.

**DO NOT CLIMB SCAFFOLD COMPONENTS
SUCH AS BRACES AND GUARDRAILS**

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one

understand the impacts of
an **effective** training
program

two

three

establish and prioritize
training and education needs

participate in an interactive
training and testing session



four

agenda

- hospital cost structure
- energy solutions
- TSS approach
- diagnostics
- interactive training



A photograph of a flock of sheep in a field. Most sheep are white, but one sheep in the center is brown with a black face. The sheep are looking in various directions, some towards the camera. The background is a dark, possibly wooded area.

change in the
status quo

The background of the slide features two orange plastic pill bottles lying on their sides. The bottle in the foreground is slightly to the right and is open, revealing several yellow, oval-shaped capsules inside. The bottle behind it is to the left and is also open. Both bottles have white labels with black text, including the words 'CAPSULES' and 'DATE'. They are resting on a surface covered with medical forms or papers, which are slightly out of focus. The overall lighting is warm and soft.

change

in healthcare
delivery

laser focus on **cost**

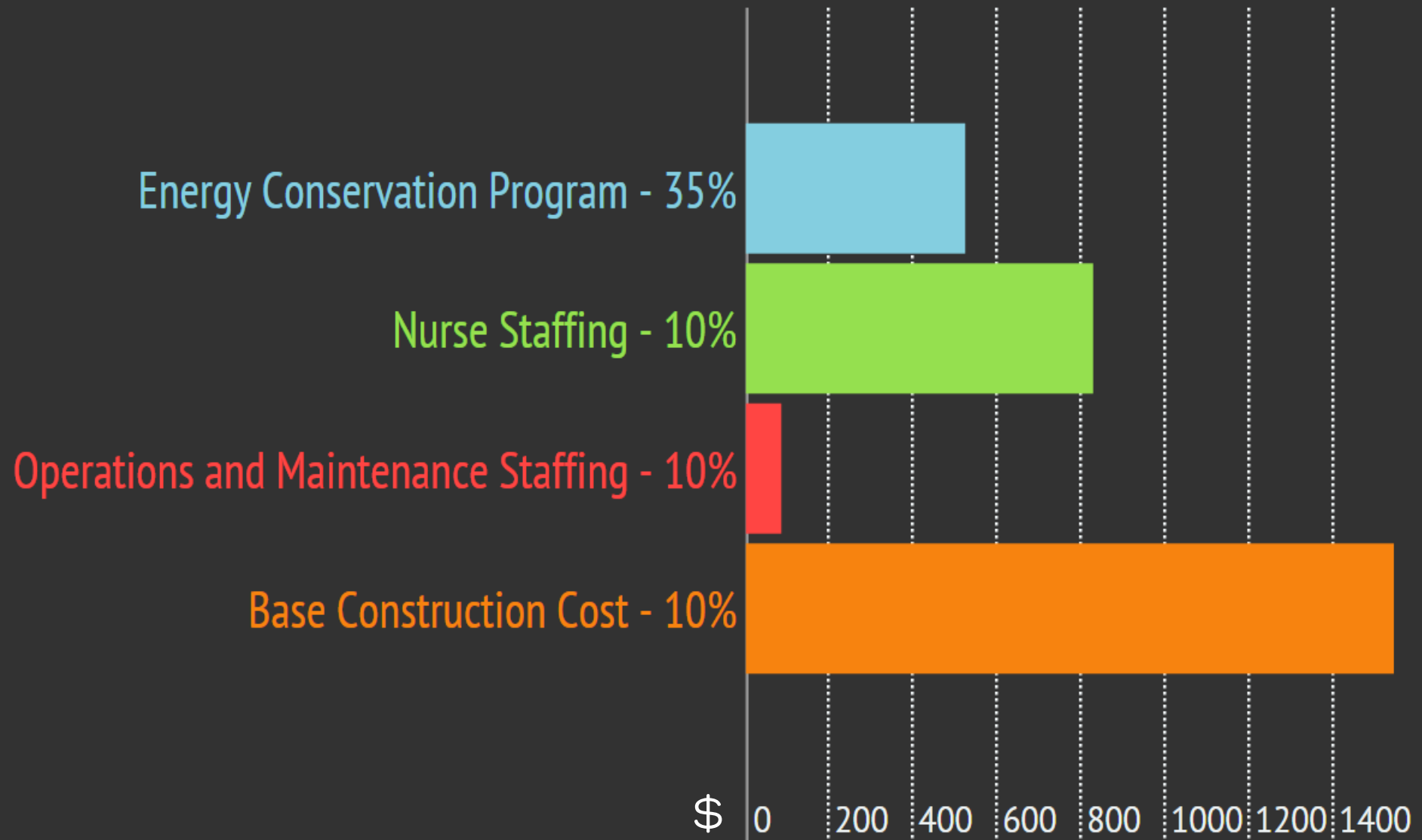




consolidation and staff reduction

business environment

facility impact on the Hospital Cost Structure



what can we

impact?



the answer is

energy

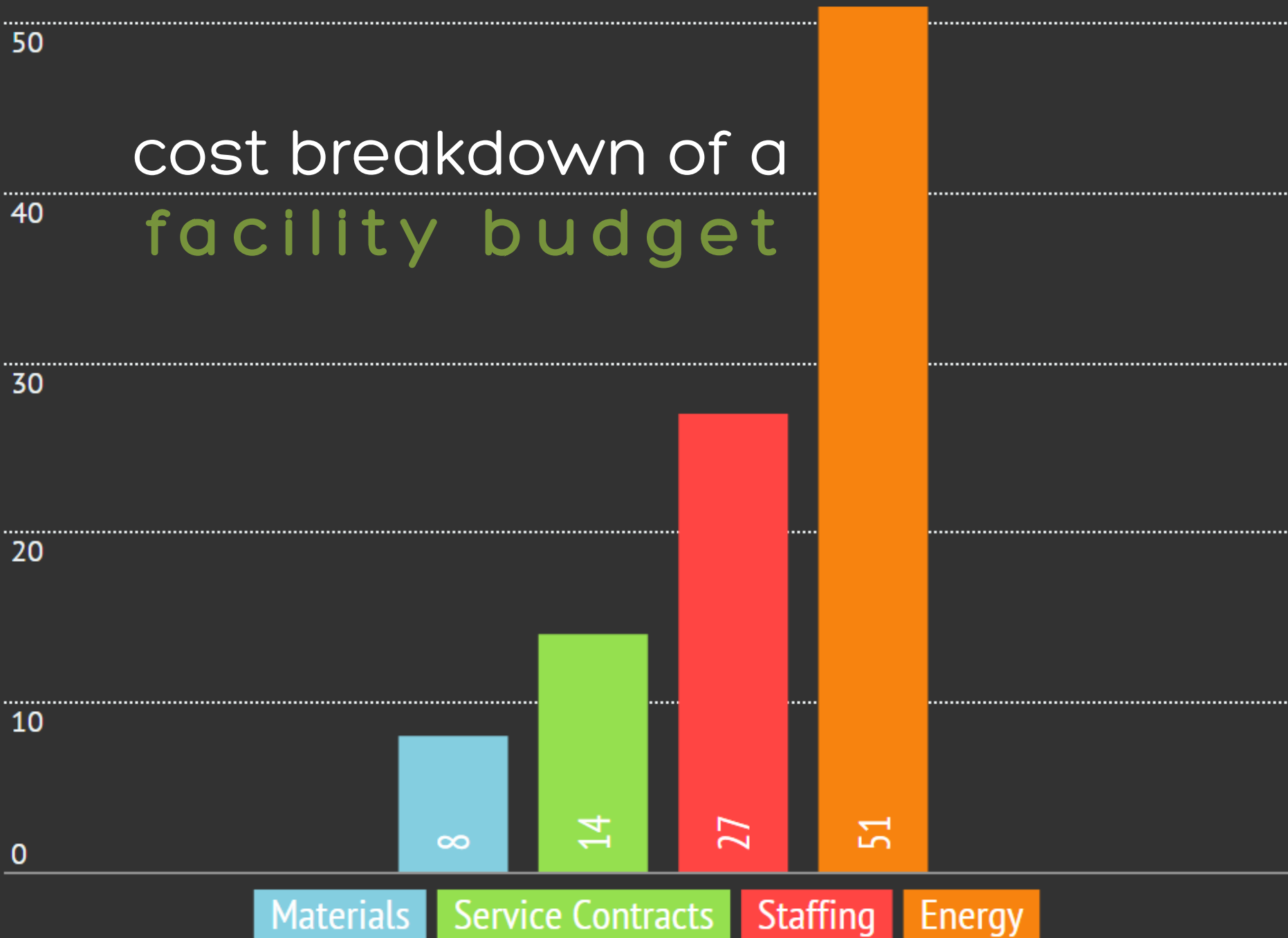


How do we
accomplish
this?

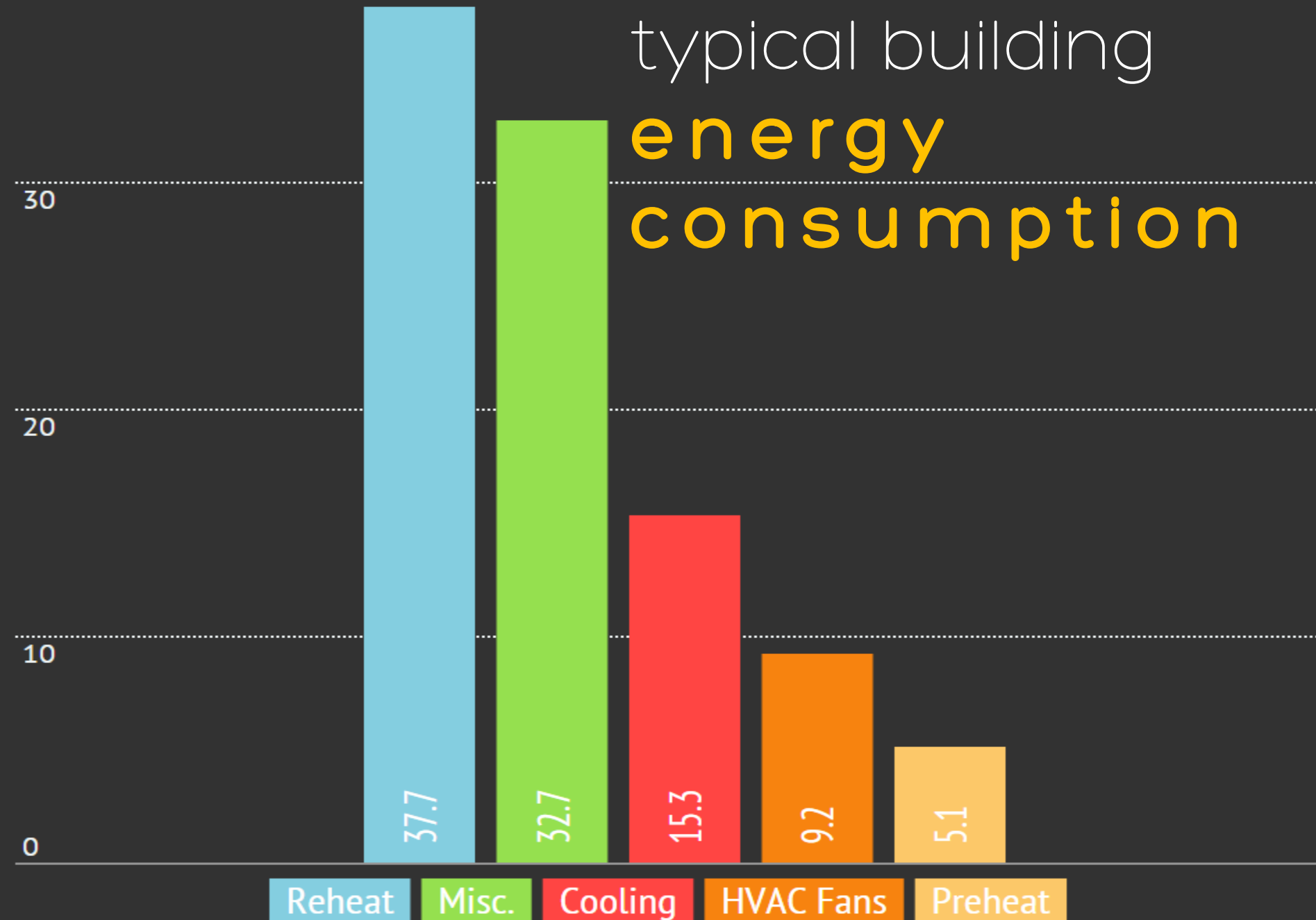


typical facility budget
averages between **\$5** and **\$15**
per square foot


cost breakdown of a facility budget



typical building energy consumption



sustainable energy solutions




retro-
commissioning:
optimizing the performance of
the energy systems

benchmarking:



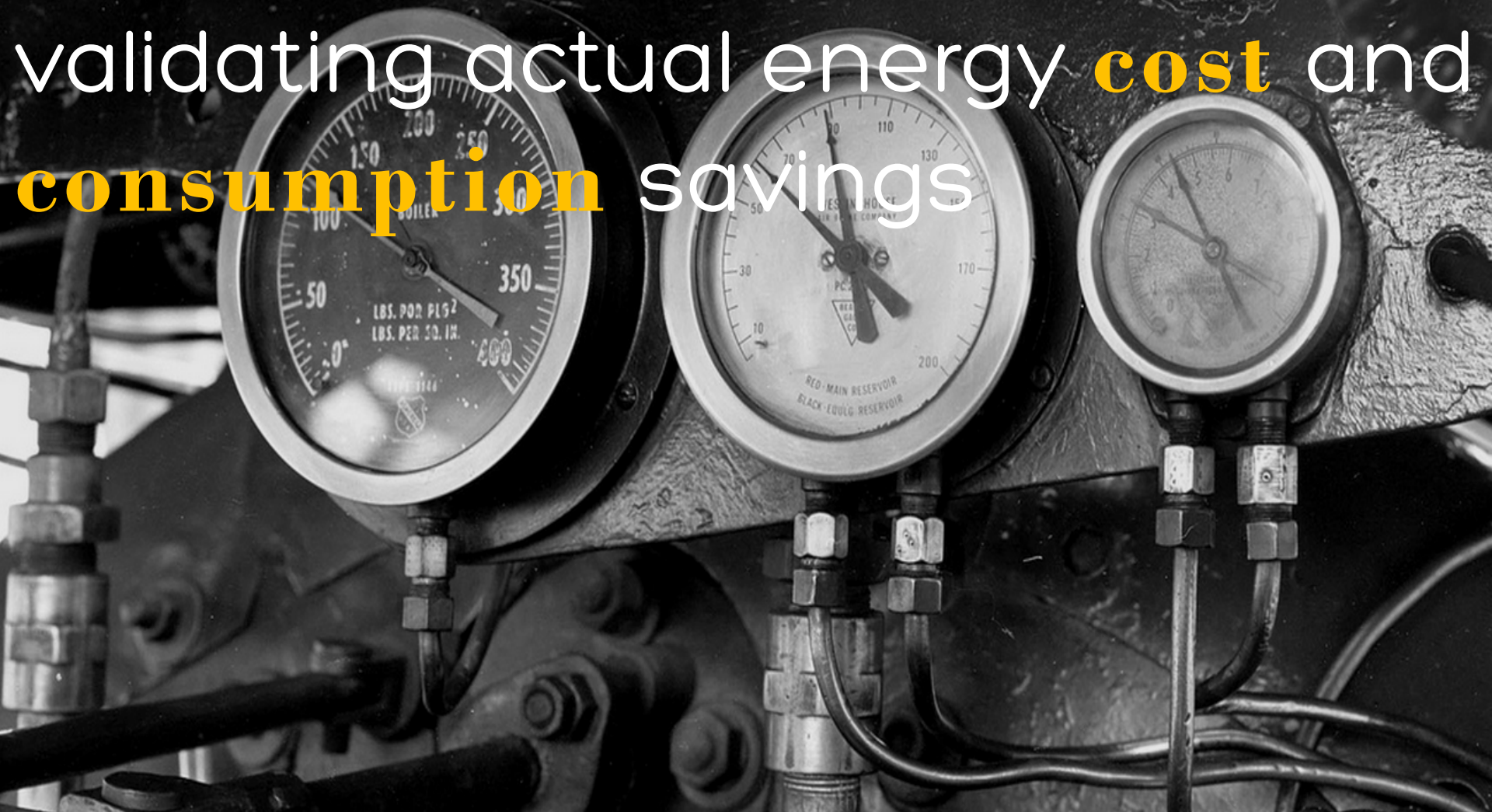
comparing facility management
department **staffing** and **costs**
to national standards



utility procurement:
purchasing energy at the
lowest possible cost


measurement and verification:

validating actual energy **cost** and
consumption savings



strategic energy
plan: comprehensive long
range plan to upgrade energy
systems over 30 to 40 years





long push:
reinvesting energy savings
into infrastructure
upgrades



asset monetization:
funding energy conservation efforts
by **monetizing central energy plants**

energy solutions goals

A scenic landscape featuring a bright sunburst over a range of jagged mountains in the background. The foreground is filled with a dense field of wildflowers, including yellow and purple blooms, under a clear blue sky.

improve
thermal comfort
indoor air quality
occupant safety



achieve and **sustain** significant
energy cost savings



upgrade building automation systems



replace **inefficient** and **obsolete**
equipment and systems





**repair or replace failed
components**



competitive procurement
of control system materials,
equipment, and labor for
current and future projects



effectively train
operations and maintenance
staff

diagnose
hot and
cold calls





room ventilation schedule **and**
air handling unit
programming modifications



chilled water system
programming modifications



heating water system programming modifications

Daily Measurement and Verification Scorecard

St. Vincent's Hospital - Clay County, FL

Monday, March 31, 2014

M&V Period Start 12/11/2013

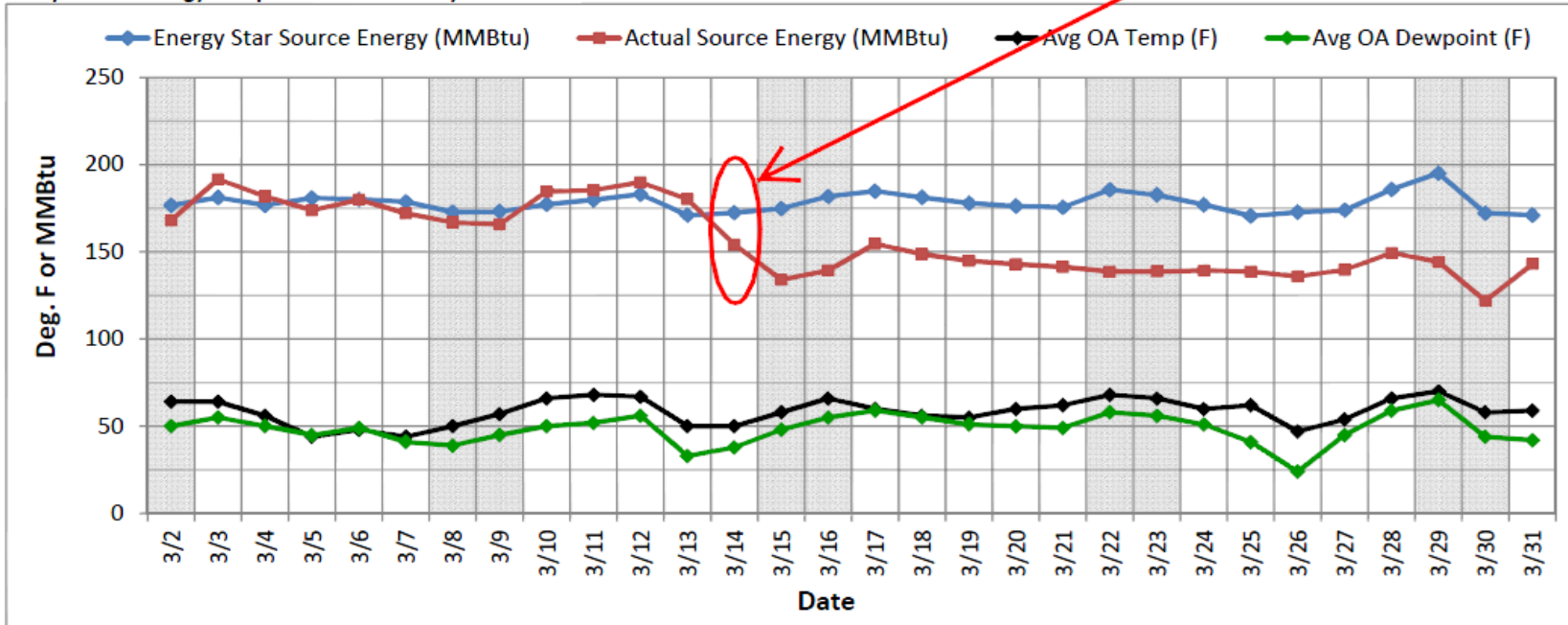
Daily Weather Data

Parameter	Units	Low	Average	High
Outside Air Dry Bulb Temperature	F	41	59	77
Outside Air Dewpoint Temperature	F	32	42	50

Daily Energy Data

Parameter	Units	Energy Star Baseline	Actual	Difference
Daily Electricity Consumption	kWh	13,267	11,681	-12%
Daily Natural Gas Consumption	MMBtu	27.5	17.0	-38%
Daily Source Energy Consumption	MMBtu	171	143	-16%
Month to Date Avg. Source Energy Consumption	MMBtu	178	157	-12%
M&V Period Avg. Source Energy Consumption	MMBtu	179	178	-1%

Daily Source Energy Comparison - Last 30 Days



implementation effects

sustainable operational efficiency

succession planning and
accreditation opportunities

effective operator training



5

five simple steps

one

pre-assessment
to determine
training requirements


two

develop the curriculum



three

e-learning programs

A photograph of an empty classroom. In the foreground, several rows of wooden desks and chairs are visible, arranged in a traditional classroom layout. The desks are light-colored wood, and the chairs are dark wood. In the background, there is a large chalkboard on the left wall and a large, multi-paned window on the right wall. The room is well-lit, and the floor is a dark, polished surface. The text "classroom and field training sessions" is overlaid on the left side of the image in a white, sans-serif font.

classroom and field
training sessions

four



exit exam to
verify retention

five

use technology to
improve productivity



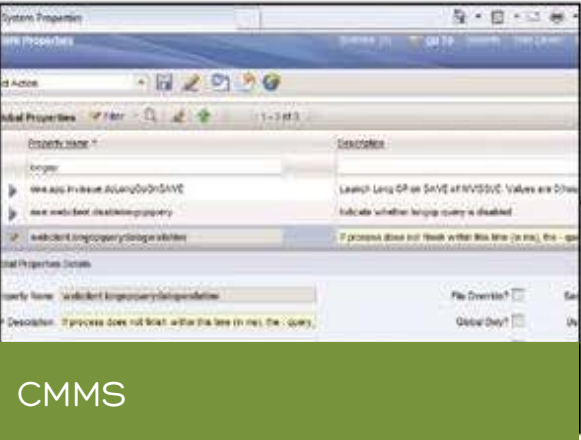
building information modeling



people



geographic information system



CMMS

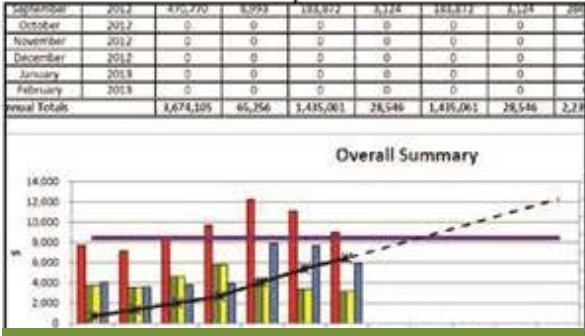


RFID tags

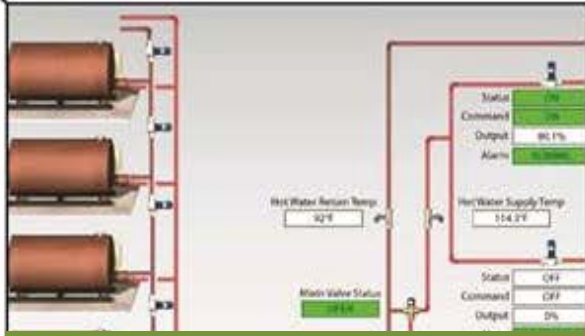
FM dashboard



computer aided facility management



energy management system



building automation system

Measurement & Verification Monthly Summary

Sacred Heart Hospital on the Gulf

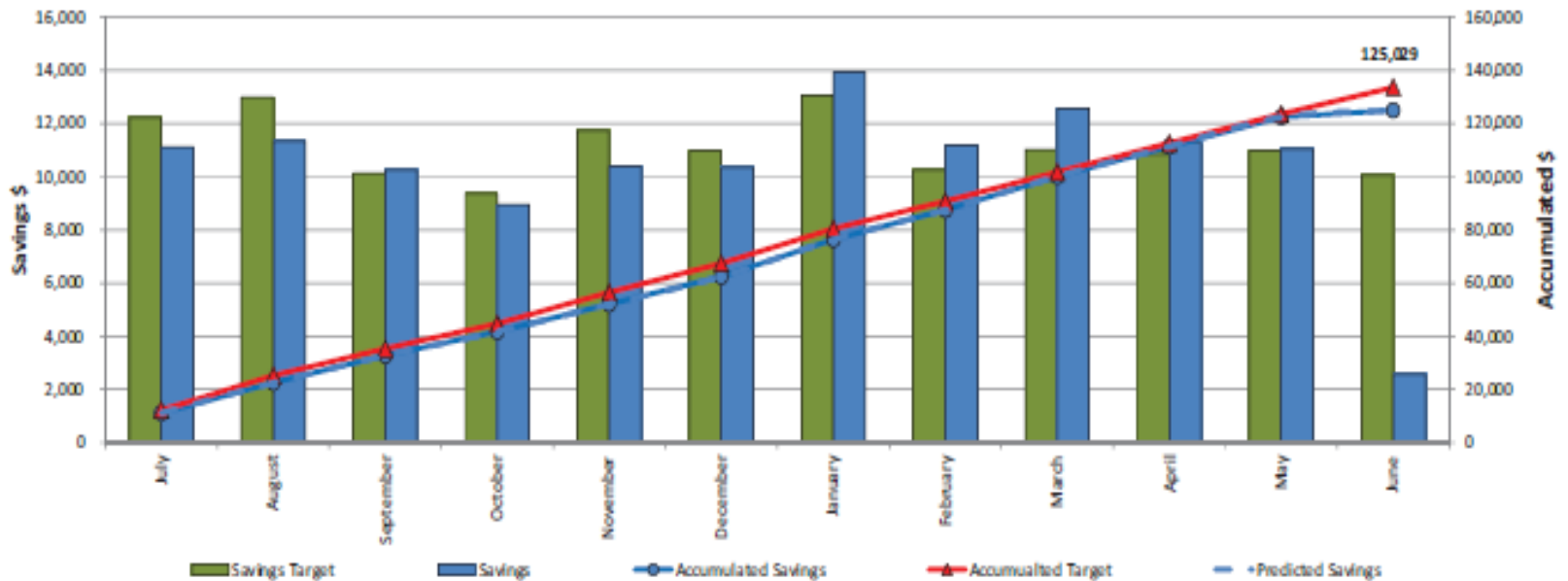
3801 E Hwy 98
Port St. Joe, FL

12-Month Report Ending:	2014	June
Airport Code:	KAAF	
Gross Floor Area: (1000 Square Feet)	64	

Overall Summary

Month	Year	Baseline		Actual		Utility Invoicing		Savings Target		Savings			Savings Percent		
		MMBtu	\$	MMBtu	\$	MMBtu	\$	MMBtu	\$	MMBtu	@ Current \$	Rate \$	% MMBtu	@ Current \$	Rate \$
July	2013	1,995	40,736	1,401	26,611	1,401	26,611	598	12,221	594	11,118	2,127	29.8%	29.3%	5.2%
August	2013	2,176	43,337	1,539	28,086	1,539	28,086	653	13,001	637	11,350	2,817	29.3%	28.6%	6.5%
September	2013	1,838	33,774	1,277	24,302	1,277	24,302	551	10,132	561	10,266	(560)	30.5%	29.4%	-1.7%
October	2013	1,708	31,256	1,207	21,650	1,207	21,650	512	9,377	501	8,957	460	29.3%	29.2%	1.5%
November	2013	2,267	39,172	1,580	25,201	1,580	25,201	680	11,752	687	10,385	2,569	30.3%	28.7%	6.6%
December	2013	2,074	36,560	1,409	23,912	1,409	23,912	622	10,968	665	10,351	1,625	32.1%	29.4%	4.4%
January	2014	2,697	43,543	1,699	25,871	1,699	25,871	809	13,063	998	13,983	2,465	37.0%	33.9%	5.7%
February	2014	2,129	34,211	1,355	21,713	1,355	21,713	639	10,263	774	11,205	870	36.4%	32.8%	2.5%
March	2014	2,225	36,760	1,428	24,270	1,428	24,270	667	11,028	797	12,589	(37)	35.8%	33.3%	-0.1%
April	2014	2,001	36,137	1,337	24,410	1,337	24,410	600	10,841	664	11,258	326	33.2%	30.8%	0.9%
May	2014	2,037	36,575	1,398	26,275	1,398	26,275	611	10,973	639	11,087	(436)	31.4%	28.8%	-1.2%
June	2014	1,864	33,523	1,659	32,001	1,659	32,001	559	10,057	205	2,580	(950)	11.0%	7.2%	-2.8%
Annual Totals		25,010	445,584	17,290	304,252	17,290	304,252	7,508	133,675	7,721	125,029	11,277	30.9%	28.4%	2.5%

Overall Savings Summary

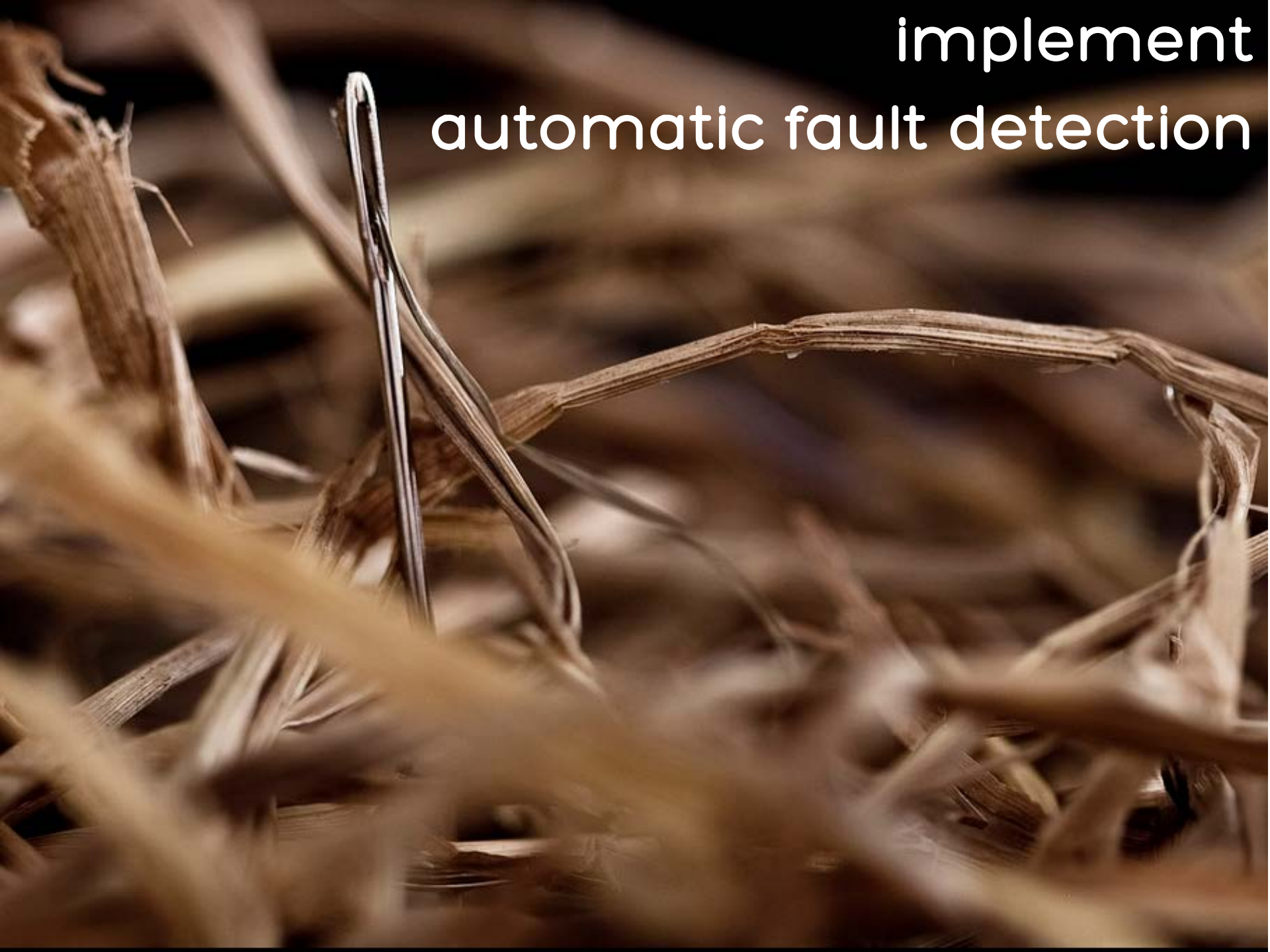


sustain energy savings with
remote support services



implement operator dashboards

implement
automatic fault detection





implement continuous data archive

communicate daily with
operators by e-mail, telephone,
text, telegram, etc.



A close-up photograph of a magnifying glass resting on a document. The magnifying glass is positioned over a section of text, which is slightly blurred. The background is a warm, out-of-focus mix of reds and oranges. The text is in a bold, black, sans-serif font.

develop and maintain
issues log and distribute
monthly reports



rewind and recap

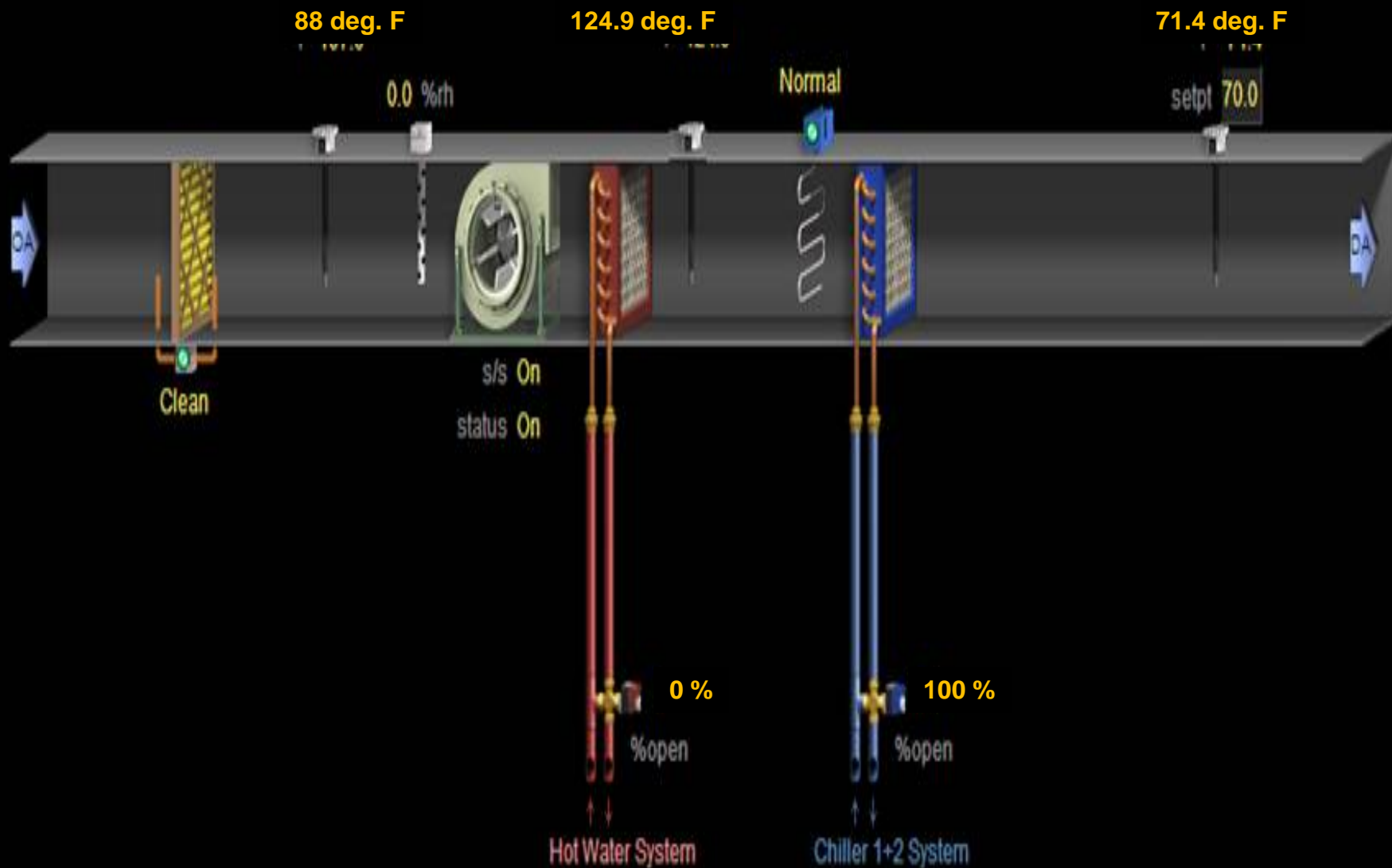
focus on your resources

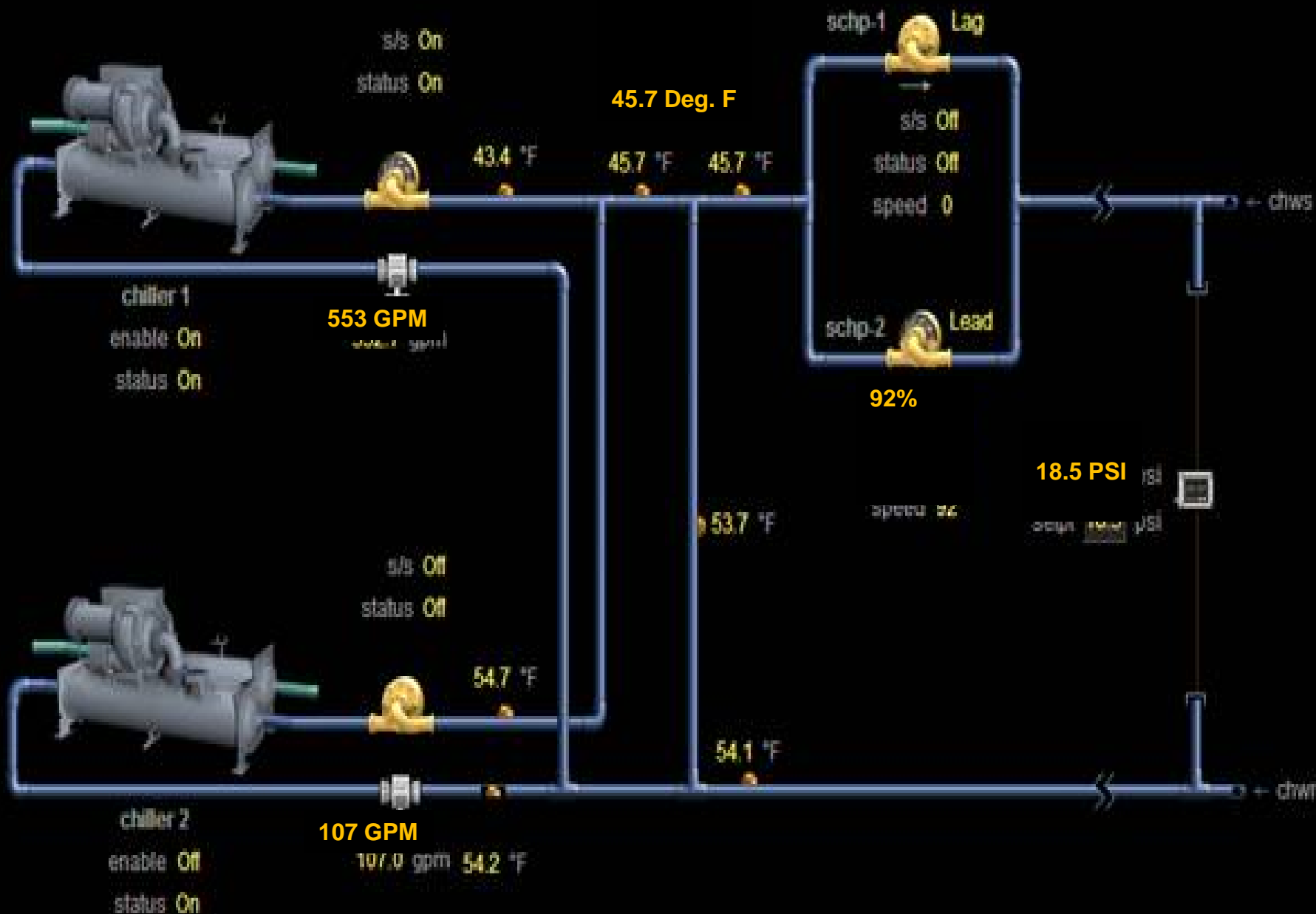
1. achieve **sustainable** energy savings
2. establish achievable and measurable **goals**
3. implement a **comprehensive training** program
4. **leverage technology**
5. shift to a **proactive** approach

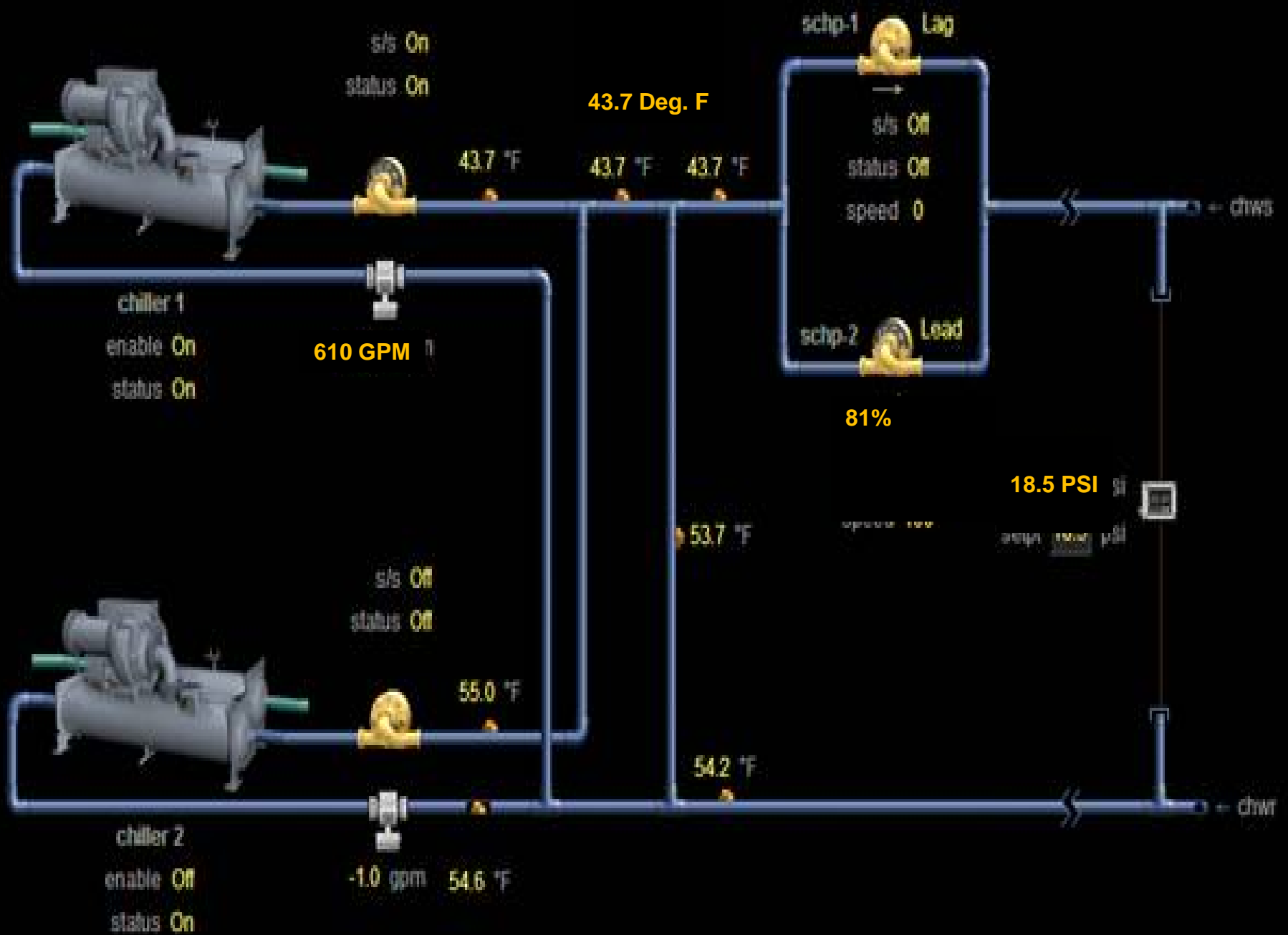
diagnostics



Q&A







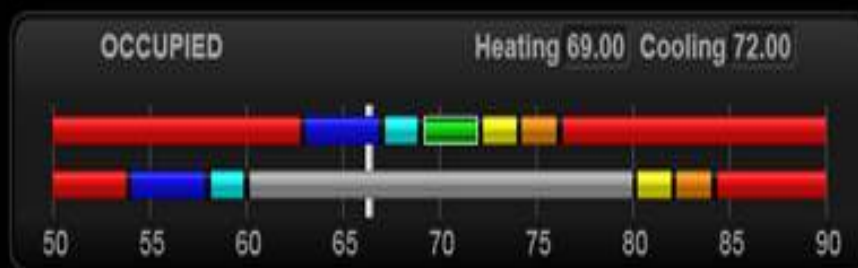
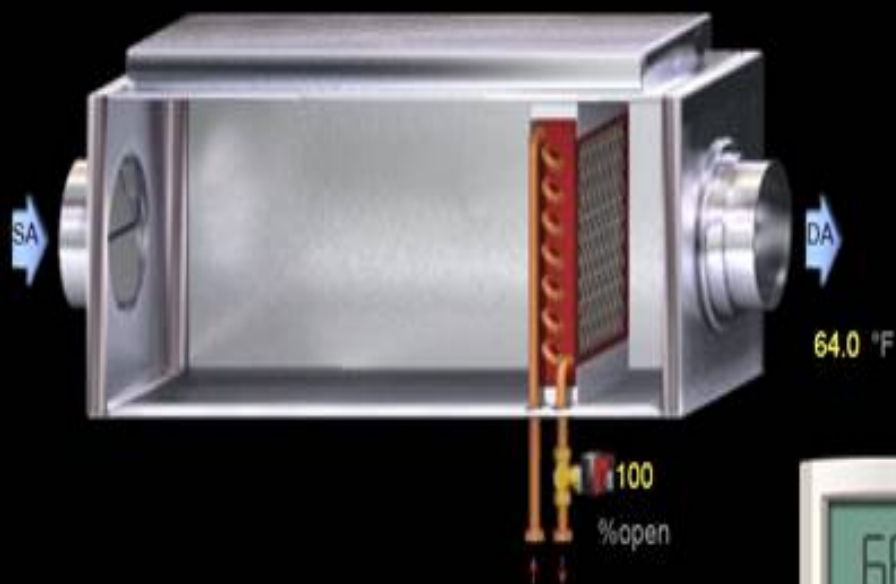


60.6 °F

CVV 5-9

airflow 156 cfm
setpoint 150 cfm
damper 34 %open

AHU-5
ahu sat 62.5 °F



setpoint adjusted by 1.0 °F
Occupied until 5:00 PM

thank

you



pop
quiz