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Steam Trap Monitoring Technology

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2020 ILAPPA CONFERENCE

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Illinois State University

Steam Trap Monitoring Technology

Background

- Implemented a campus wide steam trap survey in 2012

- First monitoring technology was installed in 2014

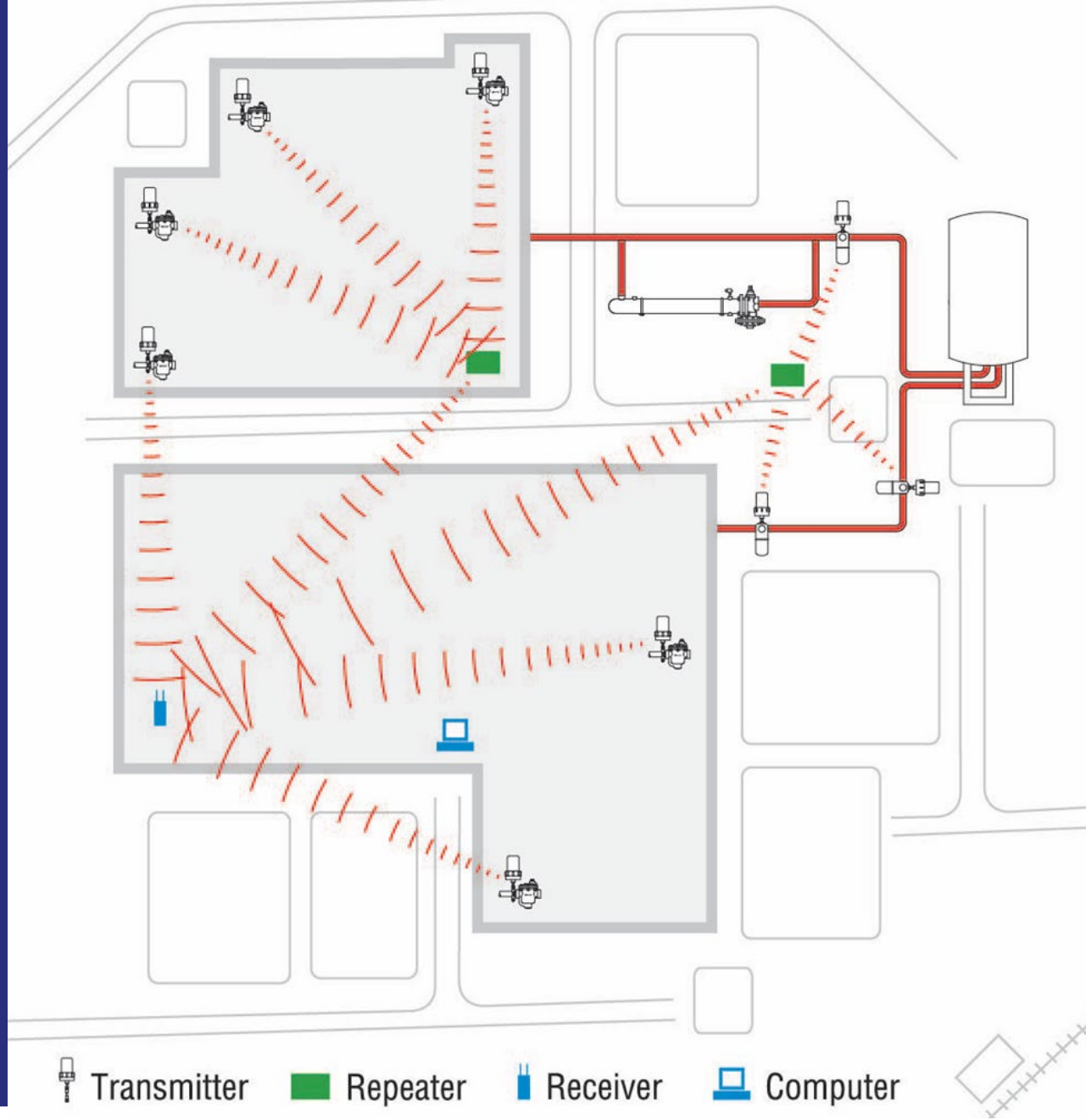
Steam Trap Monitoring Technology

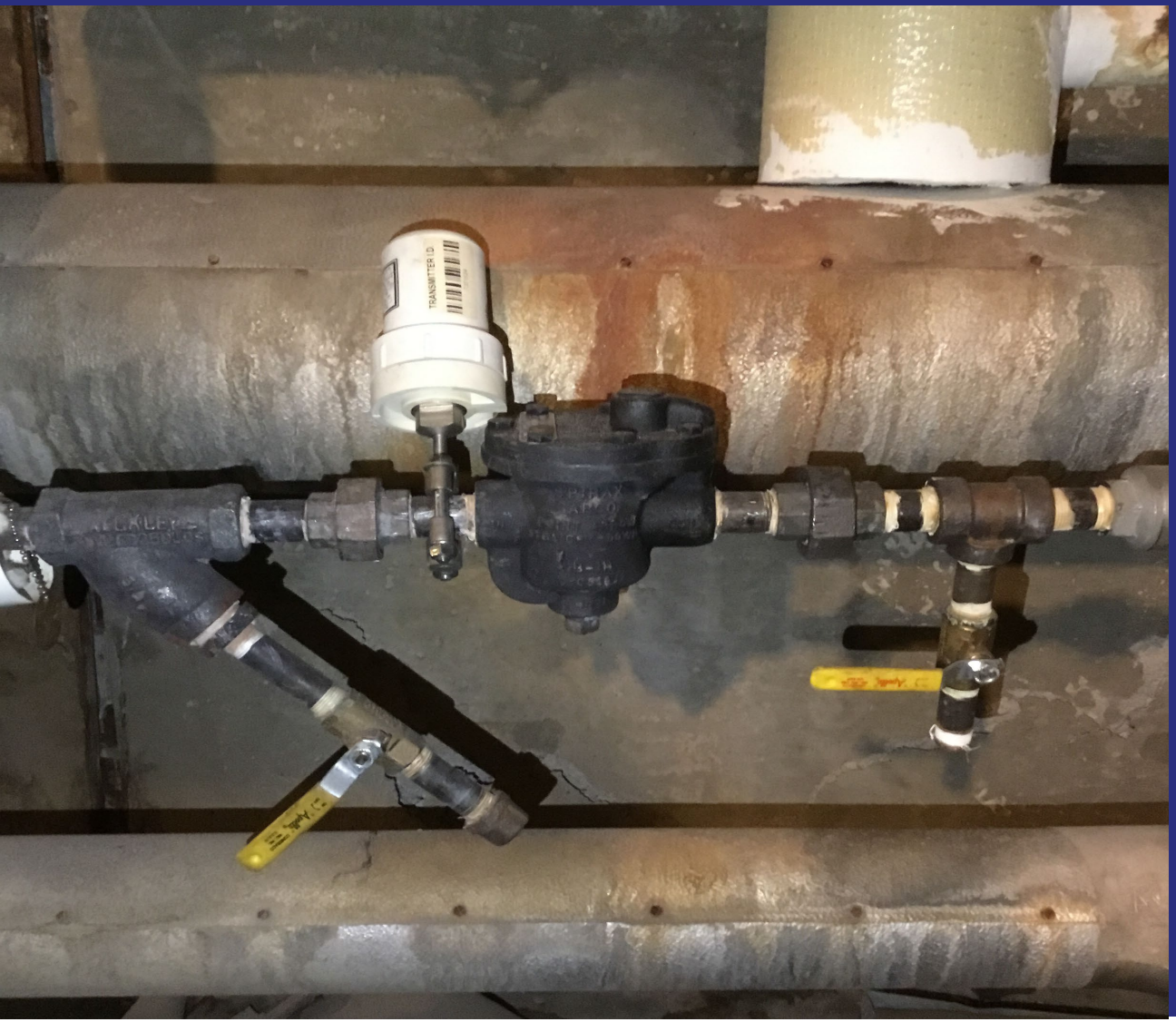
Why?

1. High pressure (110 P.S.I.) traps are manually tested once per month.
2. One High pressure trap that has failed open, Costs $600/month
3. A trap that has failed closed, can cause water hammer and damage to piping/components

System Components

- Transmitter
- Repeater
- Receiver
- Computer





Transmitter

The wireless transmitter clamps to the pipe sensing temperature of the piping and an ultrasonic signal of the piping, relaying real time status information to the repeaters

Transmitter

- 5 status indications
    - OK
    - Blow thru
    - Cold
    - Lost
    - Low

Repeater

Relays transmitter status to the next repeater until information reaches the receiver

Receiver

Downloads repeater information to a web based software program sending e-mail notification of a status change

Software

Critical Equipment | Failed Equipment | **All Equipment** | Configuration | Logout

All Equipment

Device Type Select Device to Filter

Tag#	Tx#	Location	Type	Model No.	Status	Battery	Radio	# State Changes	Last Report	Previous Report - State	Cycle Count
NWT-01	7351376	NW Tunnel Isolation Vale	Steam Trap		OK	OK	65	81	Wed Jan 29 13:40:03 2020	Sun Jan 19 03:06:28 2020 - CD	N/A
NWT-02	7351571	First North of #1	Steam Trap		OK	OK	18	53	Wed Jan 29 13:17:45 2020	Sun May 12 19:36:13 2019 - CD	N/A
NWT-03	7351588	NW & Hancock Merge	Steam Trap		OK	OK	39	40	Wed Jan 29 13:39:37 2020	Sat Jun 15 22:36:37 2019 - LOS	N/A
NWT-04	7351591	Hancock Middle Pill Box	Steam Trap		OK	OK	31	129	Wed Jan 29 13:32:00 2020	Mon Nov 11 11:55:57 2019 - CD	N/A
NWT-05	7402164	KFB Tie-In	Steam Trap		OK	OK	40	33	Wed Jan 29 13:37:39 2020	Sun May 12 17:29:13 2019 - CD	N/A
NWT-06	7351635	RAB Merge	Steam Trap		OK	OK	19	119	Wed Jan 29 13:39:31 2020	Sun Oct 13 16:54:31 2019 - CD	N/A
NWT-07	7351638	RAB Steam Station(high side)	Steam Trap		OK	OK	17	143	Wed Jan 29 13:30:44 2020	Sat Jan 25 17:23:04 2020 - CD	N/A
NWT-08	7351565	RAB Steam Station(med. side)	Steam Trap		OK	OK	20	66	Wed Jan 29 13:40:14 2020	Sat Oct 12 10:54:28 2019 - CD	N/A
NWT-09	7351634	North RAB Pill Box	Steam Trap		OK	OK	23	58	Wed Jan 29 13:36:15 2020	Sun May 12 19:46:31 2019 - CD	N/A
NWT-10	7351521	Glasshouse South Pill box	Steam Trap		OK	OK	34	39	Wed Jan 29 13:36:06 2020	Sat Jul 6 16:13:52 2019 - LOS	N/A
NWT-11	7402167	Glasshouse NW Pill Box	Steam Trap		OK	OK	13	45	Wed Jan 29 13:35:06 2020	Sun May 12 19:49:45 2019 - CD	N/A
NWT-12	7351525	Mid UH N/S Pill Box	Steam Trap		OK	OK	21	45	Wed Jan 29 13:40:12 2020	Sat Dec 7 11:53:41 2019 - LOS	N/A
NWT-13	7402098	UH Take-Off	Steam Trap		OK	OK	0	49	Wed Jan 29 13:14:07 2020	Wed May 22 19:37:08 2019 - LOS	N/A
NWT-14	7351529	UH E/W Tunnel	Steam Trap		OK	OK	6	66	Wed Jan 29 13:31:56 2020	Sun May 12 17:37:10 2019 - CD	N/A
NWT-15	7402031	Between UH and GFS	Steam Trap		OK	Low	14	43	Wed Jan 29 13:36:59 2020	Sat Jul 13 01:04:11 2019 - LOS	N/A

1 2 3 4 Next>>

Questions?

Contact Information

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Adjusting to Changing Technologies in HVAC

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The Situation of Automation
"Where we were"

- Most of the Siemens network was RS-485. Across four trunks we still had far too much traffic on this network.
- We had limited storage and obsolete O.S.'s. This required us to buy a new server for Insight.
- Insight is going to be unsupported by Siemens soon. The vast majority of controllers on campus are Siemens P2 (Proprietary).

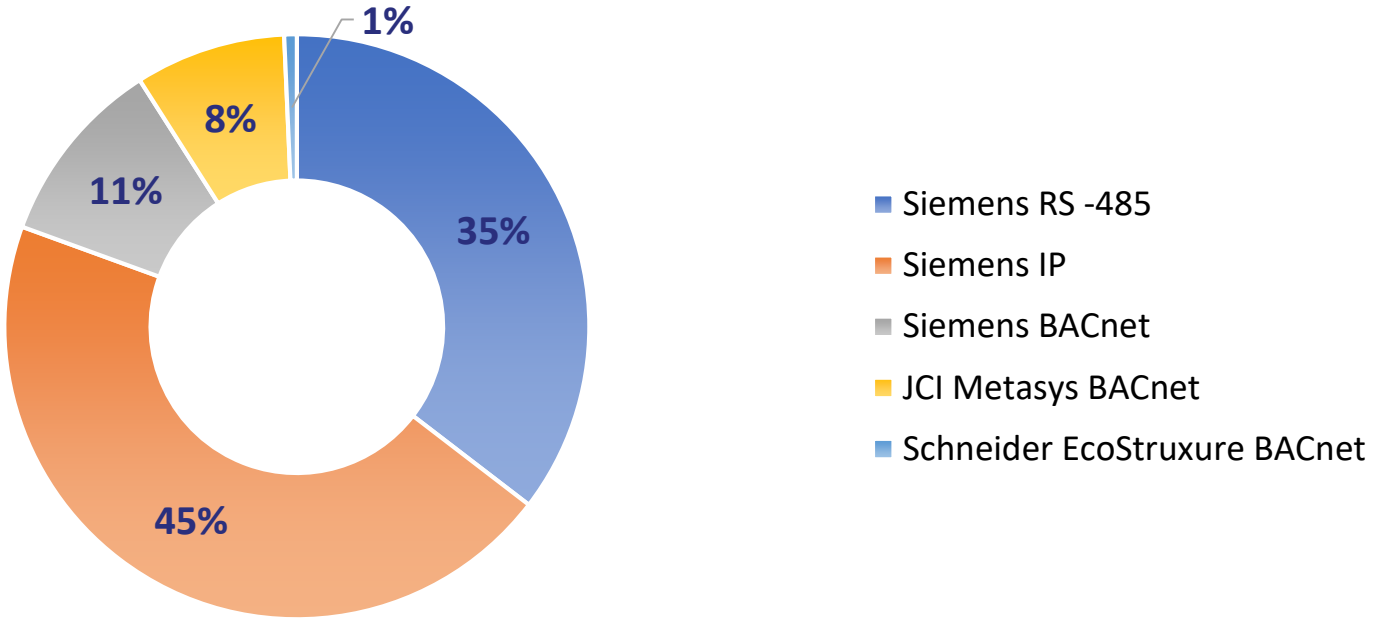
The Situation of Automation
"Where we were"

ISU's campus currently hosts four building automation systems:

- Siemens Insight
- Siemens Desigo
- Johnson Controls Metasys
- Schneider EcoStruxure

The Situation of Automation
"Where we were"

Mix of 144 Building Automation Controllers



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The Situation of Automation
"Where we were"

Over 90% of our system on campus is Siemens

- Desigo is a BACnet based system
- Desigo is compatible with P2 over IP panels

The Situation of Automation
"Our Goal"

Our priority is to have one front end for our operators and end users.

This will require:

- Updating Siemens Legacy Controllers & Installing Ethernet Communications
- Migrating JCI & Schneider Controllers to Desigo
- Training For Everyone

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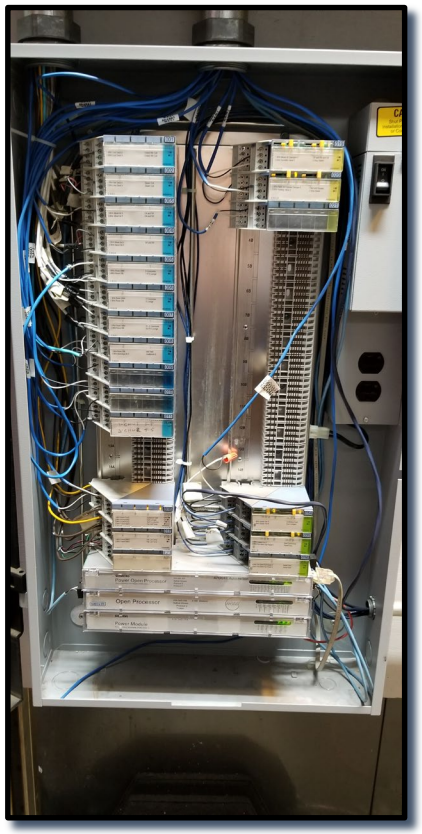
"Our Goal"

Replacing Legacy Controllers

Siemens MEC Controller

Siemens MBC Controller



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"Our Goal"

Replacing Legacy Controllers

An AEM will be used for panels that cant be replaced quickly

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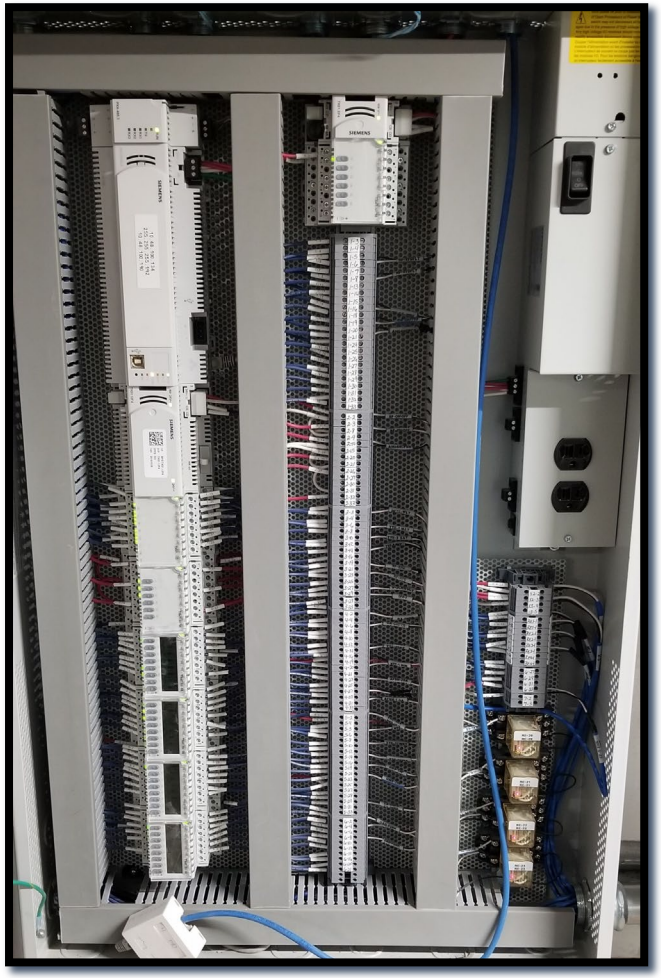
Controllers Compatible for the Migration



Siemens PXC100

JCI Metasys NCE & NAE

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The Situation of Automation
"Our Challenges While Migrating"

- Upgrading Siemens legacy controllers to BACnet requires rebuilding the point database
- Compatibility issues with Insight & Win10
- Insight BACnet has difficulty with some features while integrating JCI BACnet
- Becoming BACnet compliant, instance numbers and BBMD's
- Learning a new BAS

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Questions?

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