

Water World, Don't Get Soaked

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Michael Fairfield, CSP Sr. Risk Control Consultant

The Zurich Services Corporation

Risk Engineering National Accounts



Objectives

- Help you identify, locate and respond to water leaks sooner
- Reduce property damage to your facility or construction site
- Help you build resilience against future events through education, preparation, prevention, response and post-event recovery
- Reduce direct and indirect costs, risks and disruption to your business from an event

Zurich's ACURE program

Water damage mitigation



A cure for water damage
to your property:
Planning and preparation



Not a fill-in-the-blank program

Six-step program

Involves assessment/documentation of exposures and controls

Established pre- and post- damage controls

Helps ensure losses are addressed effectively pre- and post- incident

Technical support provided by Zurich Risk Engineers

ACURE – liquid damage program

A six step program

Risk assessment <ul style="list-style-type: none">• Identifying areas exposed• Identifying potential loss causes	Prevention <ul style="list-style-type: none">• Preventative maintenance• Periodic inspections• Lockout/Tag-out procedures• Seal penetrations• Relocating equipment or piping	Mitigation <ul style="list-style-type: none">• Valve identification• Containment• Supplies• Backup procedures
Response <ul style="list-style-type: none">• Spill carts• Notification training• Response training• Available staff	Recovery <ul style="list-style-type: none">• Vendors readily available for repairs, supplies, equipment• Backup equipment	Post-incident analysis <ul style="list-style-type: none">• How did it happen?• Can it happen again?• Do we have other areas with similar exposure?

Risk assessment

Identify areas at risk and potential hazards

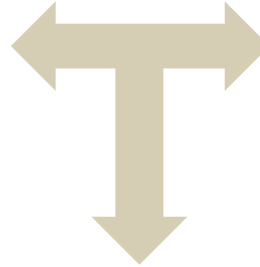
Areas to consider

- Occupied areas
- Laundries
- Subsurface parking
- Mechanical rooms
- Labs
- Normally unoccupied areas



Location of equipment is critical

- Top floor or roof
- Below grade basement
- Over main occupied area
- Concealed space



Potential hazards

- Equipment in residential spaces
- Liquid piping located above spaces
- Freezing
- Contractor errors
- Poor sealing of floor openings
- Old equipment
- Poor condition of drains
- Abuse of drains



Prevention measures

The right actions up front can help prevent or reduce impact of water events

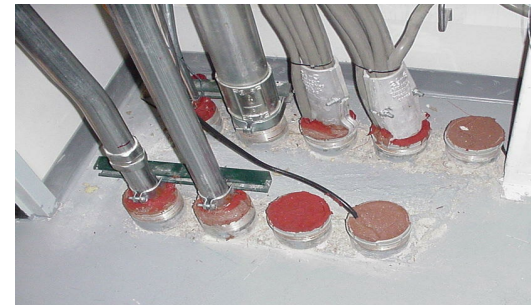
Procedure / policy

- Exercise valves on a regular basis
- Conduct periodic inspections
- Keep up to date with preventative maintenance
- Identify location of spill cart and properly stocked materials



Continuous improvement and update

- Install shut-offs when new installations are performed
- Install dikes and drains around pumps and other equipment
- Relocate equipment or piping as able
- Seal penetrations



Water damage prevention checklists

Core

- **Critical equipment areas**

Critical equipment areas such as tenant equipment, main telephone rooms, electronic data processing centers, etc., can exacerbate even a small water leak.

>>> [Download checklist](#)

- **Roof evaluation**

Water entry into buildings from outside can also cause serious damage. As with interior exposures, much of this potential risk can be identified in advance.

>>> [Download checklist](#)

- **Vendor phone list for emergencies**

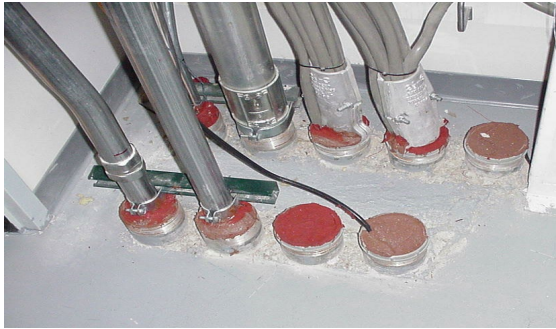
Having a list of key vendors who can assist in the event of a water damage loss can help you mitigate a loss.

>>> [Download checklist](#)



Best practice examples

Properly sealed floor



Relief valve plumbed to drain



Hot water heater with drip pan and connection to drain



Properly posted pump shut-off instructions



Process water tank containment



Response – first steps

When water is discovered

Initial actions

- Turn off power to effected areas
- Shut off water supply at the source
- Cover/protect valuables
- Ensure building structure is safe
- Notify appropriate personnel

Internal notifications

- Management
- Personnel responding to incident

External notifications

- Professional cleanup vendor(s)
- Professional equipment restoration vendor(s)
- Zurich Claims Reporting Care Center (800-987-3373)
- Servicing vendors for critical and valuable equipment
- Sources for renting additional wet vacuums and dehumidifiers



Safety considerations

Power

Shut off power only when safe to do so

- Water and electricity are a dangerous combination and can cause electrocution
- Do not shut off the power yourself if you must stand in water to do so
- Contact your local fire department and/or utility company to shut off the power

Water

- Do not shut off sprinkler systems
- Do not shut off essential supply lines where critical (e.g. healthcare)

Response actions

Responding quickly with the right actions can help mitigate damage

Reporting and responding

- Encourage residents to report even small leaks
- Train employees and residents to report any noticeable changes in water pressure
- Respond aggressively to any liquid spill
- Direct liquid to drains as fast as possible
- Cover valuable equipment with tarps
- Remove absorbent materials from water ASAP
- Involve contractors ASAP
- Notify insurance carrier ASAP
- Take photos prior to cleaning up

Protecting your equipment

Immediate and proper action helps prevent additional damage and often promotes faster return to normal services/operations:

- Keep equipment de-energized until authorized by qualified restoration personnel
- Drain all water
- Remove or cover equipment
- Set up fans and dehumidifiers
- Wipe down and dry metal surfaces ASAP
- Follow up with professional restoration services

Download the handling losses checklist

Zurich developed a checklist to assist you in dealing with losses from the perspective of both a facility manager and a risk manager. >>>

[Download checklist](#)

Thank you

Risk Engineering National Account

Shawn Harding

Director – Facilities Services – The University of Kansas
shawnharding@ku.edu



923 Restrooms

2,228 Commodes

772 Urinals

1,835 Hand Washing Stations (sinks)

538 Drinking Fountains

127 Fire Sprinkler Systems

11,908,562 sq.ft.

1862 Oldest building (Sudler Annex)

Large deferred maintenance backlog

Summerfield Hall - 1

April 14, 2018

- Flusher pop-off (\$0.25 part) on a commode
- Floor drain in the room but water went around it
- Relatively minor leak but persisted through the weekend. 3rd floor event.
- 'Waterfall' from one floor to the next down to the basement
- Somehow managed to save the recording studio in the basement...



Summerfield Hall - 1

April 14, 2018

- Cleanup costs \$14k
- 960' of wall base
- Sheetrock replacement / paint / ceiling tiles
- 39 internal labor hours
- Fire alarm panel cost \$2,500
- Total \$19,710

- Root cause analysis process -> prevention measures
 - Prevent water from leaving the restroom (down the drain)
 - Check flushers regularly
 - Seal floor penetrations
 - Hoods on fire panels
 - Identify shutoffs for quick response



Summerfield Hall - 1

April 14, 2018 – costs not included

Air quality?

Disruption costs?



Summerfield Hall - 1

April 14, 2018

- Installed door thresholds - \$37 each (materials and labor)



Summerfield Hall - 1

April 14, 2018

- Fire panel water shields - \$276 (mostly labor)
- (created in 27 locations on campus)



Summerfield Hall - 1

April 14, 2018

- Started monthly 'Reliability Check' program
- Internal staff and/or 'return to work' program staff can participate
- Check restrooms
 - Toilets/urinals
 - Sinks
 - Floor drains
- Check floor drains in restrooms and mechanical rooms
- Check exterior breezeway drains
- Submit new work orders for anything that needs to be addressed in depth.
Make quick fixes while you're there.
- Hundreds of issues found and resolved – mostly under \$100 repairs (parts and labor)

Reactive vs. Preventive - CMMS

“You’ll spend at least 4x reacting vs. preventing”

“You can’t manage what you can’t measure”

• Work Order Culture

All work goes to the work order. Capture the ‘Total cost of Maintenance’

- Labor
- Materials
- Services

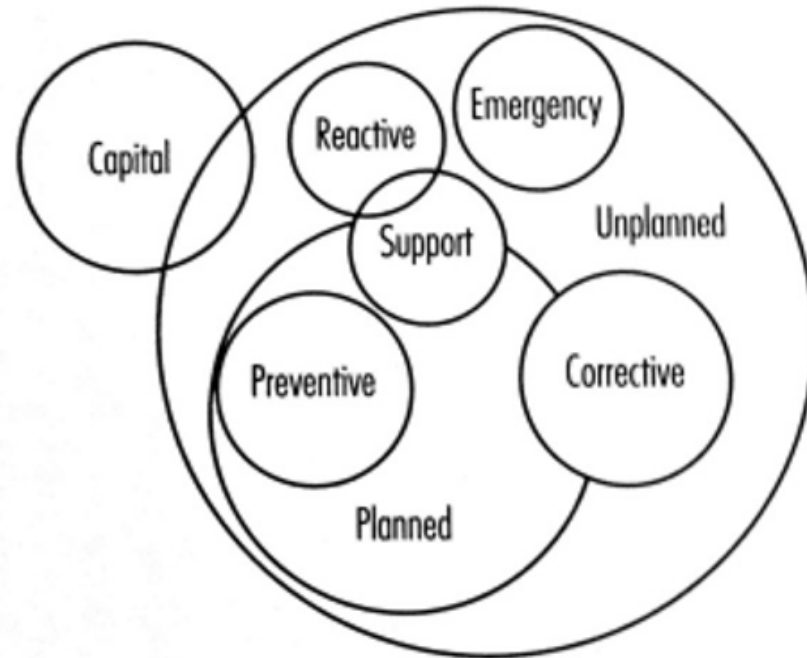
RM - Reactive

PM - Preventive

CM - Corrective

CAP - Capital

SPT - Support



Reactive vs. Preventive - CMMS

“You’ll spend at least 4x reacting vs. preventing”

“You can’t manage what you can’t measure”



Emergency (Immediate response)

Life/safety/imminent property damage threat and/or core/critical service failure.



Urgent (2 hour response)

Potential to become emergency or disrupt service if no action is taken.



Scheduled (Scheduled response)

Date sensitive requests. PM work.



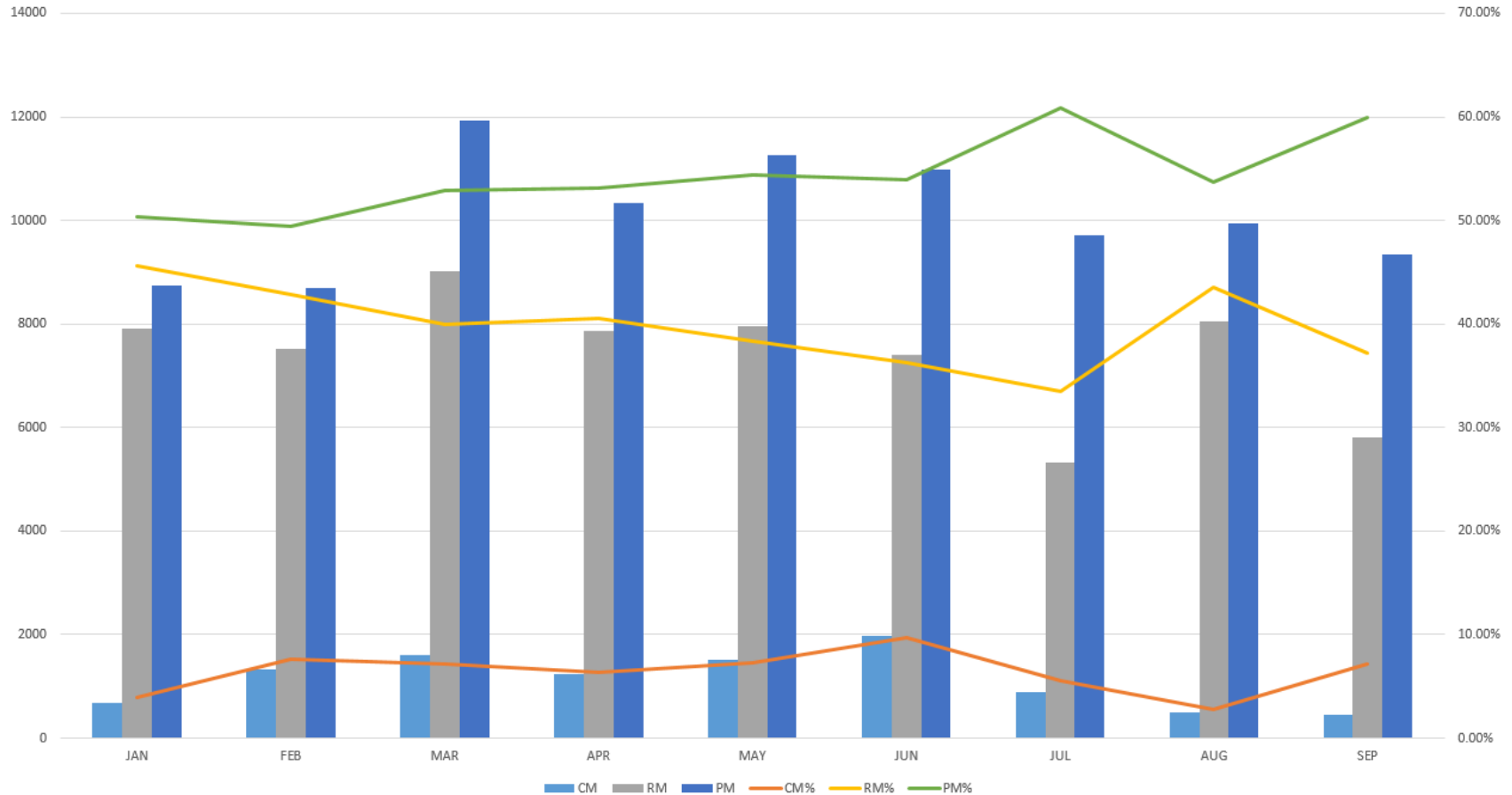
Routine (5 day response)

Non-urgent, non-scheduled.

Reactive vs. Preventive - CMMS

“You’ll spend at least 4x reacting vs. preventing”

“You can’t manage what you can’t measure”



Summerfield Hall - 2

Dec. 2019

- Drinking fountain was jammed in and stayed on.
- Overshot the bowl and went onto the floor.
- Unreported – continued overnight
- 1st floor down to basement
- Damage/recovery ~\$13k

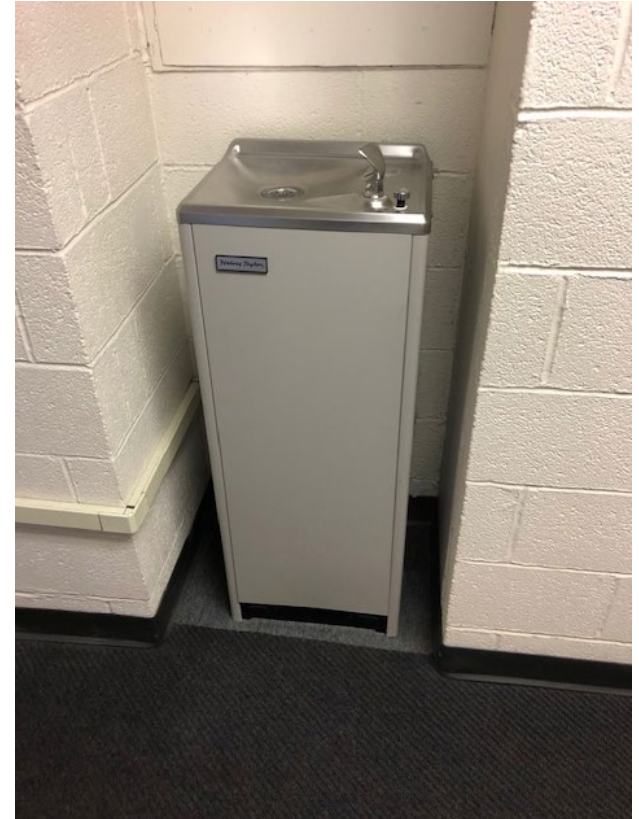
Summerfield Hall - 2

Dec. 2019

- Drinking fountain was jammed in and stayed on.
- Overshot the bowl and went onto the floor.
- Unreported – continued overnight
- 1st floor down to basement
- Damage/recovery ~\$13k
- Root cause / prevention measures
- WHY DO WE HAVE SO MANY DRINKING FOUNTAINS??

Summerfield Hall - 2

Dec. 2019



Summerfield Hall - 2

Dec. 2019



Summerfield Hall - 2

Dec. 2019



Bottle fillers

High demand

Good for the environment

Auto-shutoff after 1.5L

Exterior

Valves and distribution lines

- Goal is to asset all exterior shutoff mains and create a preventive maintenance (auto generate) work order to annually exercise each valve.
 - Replace immediately when they don't work properly or are locked up. In the event of an emergency, you need to know those valves will work.
- Each identified in campus GIS system as well as underground lines.
 - Track year installed and piping type (keep updated with changes)
- Create an internal *policy* to replace entire line and connected valves whenever possible.
 - Only use menders when absolutely necessary (never)
 - Consider alternate feeds on continually broken lines
 - Since you're digging and disrupting, you might as well get it right.
 - Difficult to put together and sell the capital for large scale replacements.

Exterior

Other considerations

- Breezeway checks
- Positive foundation grading
- Roof and downspout checks



Interior

Valves and distribution lines

- Identify and provide wayfinding signage so that EVERYONE on our services team can quickly and confidently shut off the water to the building.
 - Target audience: Custodians (2nd and 3rd shifts)
 - Shut the building water down and call a plumber – don't wait.
 - *If the valve(s) are not easy to access, consider cutting new ones in*.
- Consider floor by floor and even restroom by restroom valves to reduce response time and reduce downtime of services for other areas.
- Annual valve exercising program in CMMS. Replace valves as needed.
- Replace entire distribution lines that have become unreliable – never mend.
- Start a distribution line inspection program with reliability checks.
- If these sound expensive, consider this:

1" waterline = 210 gal/min (3.5 gal/sec)



Interior

Valves and distribution lines



Floor penetrations

Interior

Floor penetrations

- If you can't seal the penetration, consider damming up around it with brick etc.
- *Keep mechanical rooms clean and clear – especially from insulation*
- Check floor drains regularly. Make sure the water CAN go where you want it to go.
- Consider door thresholds but be mindful of ADA requirements.



Interior

Other considerations

- ‘Water Bug’ alarms – IOT connected devices. Need a response plan.
- Water bug connected shutoff valves
- Meter alerts when usage spikes
- Winter extreme cold temperature setbacks. (10F or lower overnight.)
 - Consider keeping buildings in ‘occupied’ mode to ensure pipes don’t freeze.
 - Is a \$500 energy savings worth a \$13,000+ cleanup?
- HVAC spring start-ups. Is the valving plan documented so you don’t inadvertently flood a building when attempting to fill cooling systems?
- Start looking at construction projects from this lens. What things discussed here could be designed in and/or become part of your design standard for buildings?

Other considerations

KU just beginning...

- Currently our water pressure/booster pump system is managed by unintelligent CLA valves. Moving to intelligent VFD drives instead. Cost is \$5k vs. \$35k for each valve (4). Goal is to use programmable VFD technology to reduce water pressure overnight, on weekends, holidays, spring break, summer break etc. to reduce the probability of water line breaks.
 - Would you rather have a water line break at 2am Christmas morning or 8am on a Tuesday...?
 - When you bring staff in overnight, you are without them the next day. Lost productivity adds up.
 - (see last slide for 2020 update)

Other considerations

KU just beginning...

- Location/access to shut-offs:



Current

Future

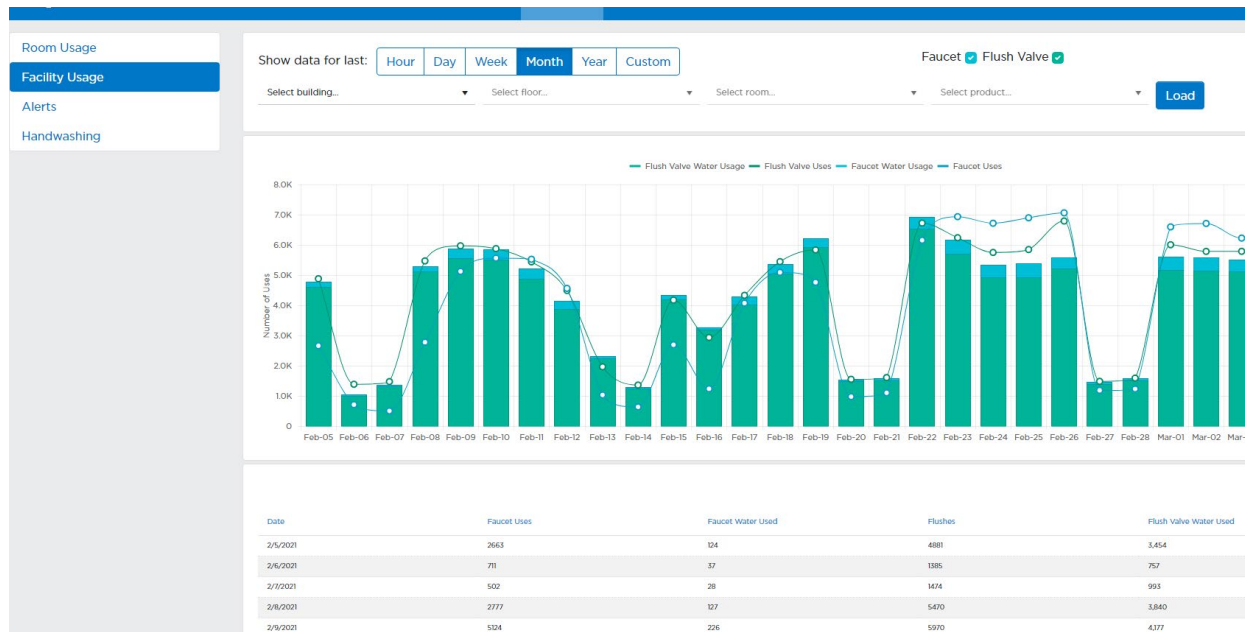
Summerfield

By the numbers (CAUTION: fuzzy math)

- Incident 1 – toilet pop-off – \$19,710 in labor/materials/services
 - Prevention:
 - \$296 for restroom thresholds saves \$15k cleanup. At \$37ea, you could install 405 thresholds.
 - \$552 panel shields saves \$2.5k new panel(s). (4.5 panels)
 - \$50(+\$100) per month reliability checks – would take over 10 years to cost more than the total incident.
 - \$5 in signage for shutoffs...(could this have been a \$19 cleanup?)
 - Recording studio avoided risk ~\$150k (architectural)
 - Total of \$998 in prevention. If focused annually, 19.75 years between incidents?
- Incident 2 – drinking fountain - \$13k in labor/materials/services
 - Prevention: reduce risk
 - Removed $\frac{1}{2}$ of the water fountains in the building = $\frac{1}{2}$ the risk = $\frac{1}{2}$ the odds of an incident = 2x the time between incidents etc.

2020/2021 Updates

- COVID funding allowed us to update 28 of our most popular buildings to touch free. New 'connected' technology gives real time monitoring and alerts.



- Deep freeze water events – Lab building, museum, dorm
 - After action on each results in
 - New construction standards for sprinkler systems
 - Studies on building envelopes (insulation etc.) with thermal imaging scanners
 - Assessing all vestibules on campus with electric heat and wet systems
 - Commitment from leadership to prioritize funding for early detection on water systems. (specifically pressure drops)
- Capital project to convert CLA valve to VFD approved
- Expanded utilization of thermal imaging scanners for detecting issues
 - Building envelope
 - Active leaks

Least favorite lines...

- **“We’ve always done it this way”**
- “That’s not my job”
- **“It happens, there’s nothing you can do about it”**

Questions?

Thank you

Shawn Harding – Director, Facilities Services – The University of Kansas
shawnharding@ku.edu

Mike Fairfield – Sr. Risk Engineering Consultant – Zurich North America
michael.fairfield@zurichna.com

