Water World, Don’t Get Soaked

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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

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

<table>
<thead>
<tr>
<th>Risk assessment</th>
<th>Prevention</th>
<th>Mitigation</th>
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<tbody>
<tr>
<td>• Identifying areas exposed</td>
<td>• Preventative maintenance</td>
<td>• Valve identification</td>
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<td>• Identifying potential loss causes</td>
<td>• Periodic inspections</td>
<td>• Containment</td>
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<td>• Lockout/Tag-out procedures</td>
<td>• Supplies</td>
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<td></td>
<td>• Seal penetrations</td>
<td>• Backup procedures</td>
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<td></td>
<td>• Relocating equipment or piping</td>
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<table>
<thead>
<tr>
<th>Response</th>
<th>Recovery</th>
<th>Post-incident analysis</th>
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<tbody>
<tr>
<td>• Spill carts</td>
<td>• Vendors readily available for repairs, supplies, equipment</td>
<td>• How did it happen?</td>
</tr>
<tr>
<td>• Notification training</td>
<td>• Backup equipment</td>
<td>• Can it happen again?</td>
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<tr>
<td>• Response training</td>
<td></td>
<td>• Do we have other areas with similar exposure?</td>
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<tr>
<td>• Available staff</td>
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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
• **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

Properly posted pump shut-off instructions

Relief valve plumbed to drain

Process water tank containment

Hot water heater with drip pan and connection to drain
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

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<th>Reporting and responding</th>
<th>Protecting your equipment</th>
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<tr>
<td>• Encourage residents to report even small leaks</td>
<td>Immediate and proper action helps prevent additional damage and often promotes faster return to normal services/operations:</td>
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<tr>
<td>• Train employees and residents to report any noticeable changes in water pressure</td>
<td>• Keep equipment de-energized until authorized by qualified restoration personnel</td>
</tr>
<tr>
<td>• Respond aggressively to any liquid spill</td>
<td>• Drain all water</td>
</tr>
<tr>
<td>• Direct liquid to drains as fast as possible</td>
<td>• Remove or cover equipment</td>
</tr>
<tr>
<td>• Cover valuable equipment with tarps</td>
<td>• Set up fans and dehumidifiers</td>
</tr>
<tr>
<td>• Remove absorbent materials from water ASAP</td>
<td>• Wipe down and dry metal surfaces ASAP</td>
</tr>
<tr>
<td>• Involve contractors ASAP</td>
<td>• Follow up with professional restoration services</td>
</tr>
<tr>
<td>• Notify insurance carrier ASAP</td>
<td></td>
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<tr>
<td>• Take photos prior to cleaning up</td>
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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
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KU

Relevant Stats

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

*Source: APPA 2011 ©*
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
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
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 (2\textsuperscript{nd} and 3\textsuperscript{rd} 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:

\[
1" \text{ waterline} = 210 \text{ gal/min (3.5 gal/sec)}
\]
Interior

Valves and distribution lines
First (this is the hard part) work with occupants to identify critical assets.

Work backward with the understanding that water will follow gravity and you are going to need to allow it to go somewhere.

You should not go into this expecting to seal up all floor penetrations. You could make things worse...
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 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:
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 ½ of the water fountains in the building = ½ the risk = ½ 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.
2020/2021 Updates

• 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

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