Water Hazard Ahead! Assessing An Aging Irrigation System

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Introduction and Outline

A. Strategies for assessing systems and risk
B. Budgeting
C. Communicating unexpected and future repairs.

A. Strategies for Assessing Systems and Risk

1. Know what is at risk in the event of a failure.
2. Know what components of the system are at risk for failure.
3. Know what to do immediately when a failure occurs to minimize further damage.
4. Make a plan to reduce the risks due to unplanned failures.

1. What is at risk in the event of a failure?

Programming – a break that interferes with the purpose of the institution/company.

Reputation- of institution, company, business, staff.

Infrastructure –wash out a green, undermine a road, flood a building.

1. What is at risk in the event of a failure?

- Budget - shortfalls from unbudgeted repairs could result in sacrificing budgeted expenditures

Rushed Repairs = higher costs

- Repairs on prepared schedule capitalize on:

-off season rates

-low irrigation times

-high availability of staff

-no effect on core functions of business.

Risks : Break Example

Multiple Risks : Convocation Example

- Programming
- Reputation
- Infrastructure
- Budget

1. What is at risk in the event of a failure?

- What if failure means no water?

2. What components of the system are at risk for failure?

- Document all failures to create a history.
  - what caused them?
  - how were they repaired?
  - what were the consequences of the failure?
  - could they have been predicted and prevented?
  - how old were the parts that failed and were replacement parts available?
  - do you have more components or installations that are like these ones?
- Ask your experienced techs for answers.

2. What components of the system are at risk for failure?

- Also consider:
  - -Compromised systems due to surface construction.
  - -Reliance on long term employee or contractor memory.
  - -Obsolete equipment
  - -Asbestos and silica concerns.

- Use history to predict future failures.

3. What to do immediately when a failure occurs to minimize further damage.

Time is of the essence.

- Enough Knowledgeable and efficient staff must be available to minimize damage.

4. Make a plan to reduce the physical and financial costs of unplanned failures.

The most compelling arguments for getting extra funding for upgrades in advance of failures are directly related to the relative value of the risks identified earlier.

The Plan

1. Know your system.

- Talk to your techs and contractors.
- Update your as-built drawings
- Gather as much info as you can and document it.
- Use a Work sheet.

SAMPLE IRRIGATION MAINLINE CONDITION ASSESSMENT WORKSHEET

Mainline Section: _____

Size :_____

Length: _____

Age or year installed. _____

Material: _____

Repair History.

Date of repair and cost if known :_____

Reason for the repair/describe failure :_____

Potential or realized secondary **risks or damages** associated with this failure :_____

Connection Points:

Type of connection. _____

Location of this connection. _____

Sizes into and out of connection. IN_____ OUT_____

Is this connection encased in concrete? Y /N Year installed_____

Materials used in components of this connection _____(Add photos if available)

Identify potential secondary **risks or damages** that could occur if this connection failed _____

The Plan

2. Share the knowledge with staff.

- Make the info easily accessible.
- Train your crew on the entire system.
- Practice operating startup and shutdown procedures, including opening and closing isolation valves as different valves feel differently and finding them can be tricky.

3. Use the knowledge to predict where failures are likely.

B. Budgeting

- Use the costs of past repairs as a budgeting tool.
- How to budget:
  - Compile and print one overall map of the irrigation system.
  - Highlight all the main lines.
  - Mark all isolation valves. Record as much as you know about the condition of the valves (1-3 scale).
  - Mark all lines and the size of each line.
  - Document the total number of isolation valves, each valve condition and the corresponding line size.
  - Review repair history of isolation valves to determine historical cost of those repairs. Use this information as an predictor of replacement costs.

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- 106 acres of campus, 50 years old system, drawing from an irrigation pond.
- 800 feet of 10” concrete/asbestos mainline.
- An irrigation control system running on an old computer because the programs are not compatible with newer operating systems.
- Limited access provided to the crew of the drawings.

All sections of the previous map enlarged so it is readable. This is what the techs have in a binder in their truck.

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All lines that are pressurized when pump is on.
Three status codes for isolation valves.

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Highlight sizes of all pressurized lines.
All isolation valves will be identified on this map.

What do these maps tell us?

1. 48 isolation valves.
2. 6 are deemed to be at the end of their service life.
3. 12 are nearing the end of their service life.
4. Urgent repairs on failed valves have cost $5000 to $11000 per valve, depending on location.
5. We can expect to spend $30000 to $60000 in the near future, if we do nothing proactively, to repair 6 valves. This does not include the costs that could be added for some of the risks to Programming, Reputation, or surrounding Infrastructure.
6. Another $60000 to $120000 in repairs are coming in the medium term future to repair 12 valves.

C. Communicating for unexpected and future repairs

Communicate the risks associated with potential future failures:

- Programming
- Reputation
- Infrastructure
- Budget: Costs will be higher if you are not proactive and will create budget shortfalls from higher overall costs.

Communicate the costs of past failures to explain anticipated future costs.

C. Communicating for Unexpected and Future Repairs

Keep messages in line with the core business of your organization.

Communicate all the risks and potential costs associated with system failures to the Directors when seeking funding for irrigation upgrades.

Presentation Takeaway

Fewer surprises=fewer losses.

- Know the risks of system failure
- Know what components might be at risk of failure.
- Know what to do if failure occurs.
- Make a plan to reduce costs of failure.
- Document your system in an easy-to-understand and accessible format.

Presentation Takeaway

- Train enough staff about the main system operations to ensure coverage.
- Be proactive to reduce overall costs.
- Communicate the risks of failures and the impact to the core business with the directors to secure and maintain funding for repairs.

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