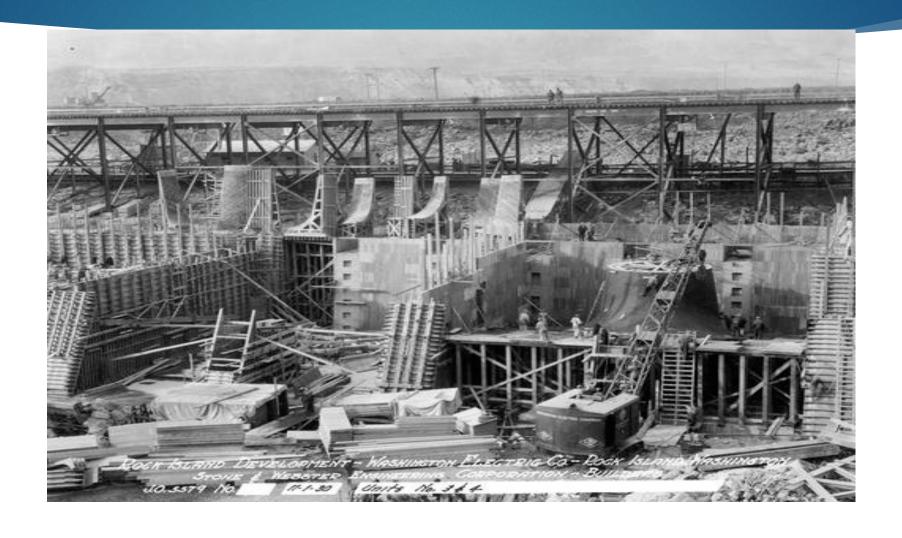
February 2019 Safety Message

A Vision of Safety

- Compliance?
- It's personal
- A promise
- A case study in error: Taum Sauk

RI Construction, 1930



Safety must be personal

- It can't be enforced not really
- There is something greater: the heart of safety is our "why"



When you know my "why"

I'm inviting you to take it seriously, to do whatever it takes to help me protect it



Our Values

Safety

protect public and employee health and safety

Stewardship

acting on behalf of customer-owners, protecting public resources entrusted to us

Trustworthiness

competence, integrity, respect

Operational Excellence

high-quality innovative work execution

A Powerful Team
Chelan County PUD Employees

A contract, a promise:

The Foundation: Science of Error

1 to 7 uncontrollable errors an hour (up to 25)

"UNDERSTANDING": INVESTIGATE

Management

Communicates time pressure / stress inadvertently

Foreman

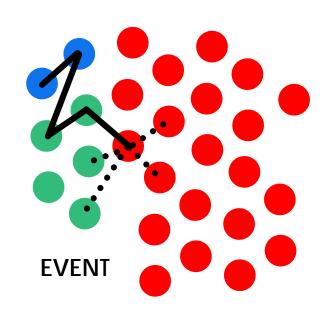
Assigns time-critical job that requires 5 people

Employee

Least experienced employee takes over 2nd role for sick veteran

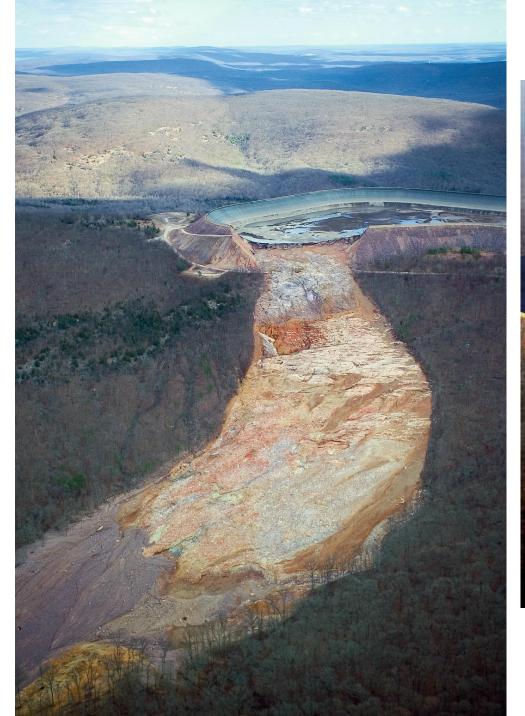
Customer

In the middle of the job, a customer does something unpredictable that requires a fast, experienced reaction



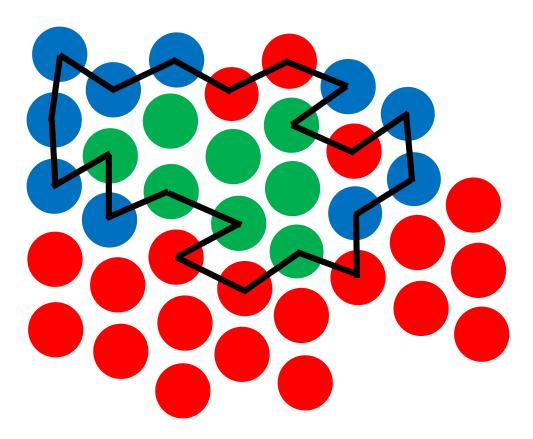
The Antidote: Stop, Think, Question

- The Theme of Sorrow: "Something didn't feel right, BUT..."
- Being willing to question, and be questioned
 - "If you don't communicate your unease or concern, we've failed together."
- It is counterintuitive and uncomfortable (at first)





A History of Error



1960: Plant designed to run remotely; no spillway

1962: Too much weathered rock selected for foundation

1963: Too many "fines" used in top layer

1965-74: 4 major earth embankment dams fail due to overtopping

1967: Leakage analysis: dam could withstand more leakage than "could be conceived"

1968: Senior leadership rejects audit inquiry regarding a spillway or overtopping provisions: no need

1970: First recorded notes on unusual erosion and extra leakage in dam's NW corner

1988: Study – storing water 6 to 8 feet high on parapet wall is "unprecedented"

1995: Deregulation – Taum Sauk changes from seasonal reserve to daily generation

1999: 100 CFS leaks – management decides to make improvements to aid efficiency / generation

2003: Engineering plan assumes new water monitoring system will be bolted to dam wall, as previous was

2004: Contractor authorized to make field changes to installation of water level monitoring system: floating cables, rather than wall bolts (and forgets to install the concrete ballast system)

No one sees the new pipes swinging and even floating in pumping flows; water levels inaccurate by as much as four feet

Freeboard reduced by one foot thanks to new system using absolute elevation

Contractor moves 2 of 4 new backup water level alarms to a higher position in order to avoid "nuisance alarms" from wave action.

2004 – 2005: Multiple "High High" backup water level alarms without a known cause

9/2005: Employees observe an overtopping in NW corner they dub "Niagara Falls"

9/2005: 1 of 3 water level transducers found to be inaccurate, and is removed. Operators instructed to manually shut down units .4 feet earlier than system indicates

10/2005: Employees discover that water level monitoring is way off, thanks to observing water levels; they manually program water level reduction by 3 feet.

10/2005: Repairs to the water level monitoring system are pushed back to be paired with other maintenance

11/2005: All materials available for system repair, but a diver is not available until the new year.

An invitation

- Our job is protecting your "why"
- Hold us accountable
 - There are a multitude of safety issues, concerns, and latent problems waiting to bite us, just as in the Taum Sauk story
 - This month, we invite you to test us
 - Send them in: through close calls, a safety concern, a phone call, or anonymously through interoffice mail

Some lessons...

- What struck you about this story?
- "Remember" is the most dangerous word
- **Sub-optimization**: changing one element of a system without considering its effect on the whole
- "Redhats": asking tough questions: where will this fail?
- "Niagara Falls" the frog in the pot
 - How does this happen?