



PRESENTERS



Seattle
City Light



Seattle
Public
Utilities

Greg Bawden

Former haz mat tech

Former safety manager for a national engineering firm,
firefighter in Duvall area for 25 years

Now EM for Eastside Fire

Snoqualmie Valley resident for 38 years

TOPICS

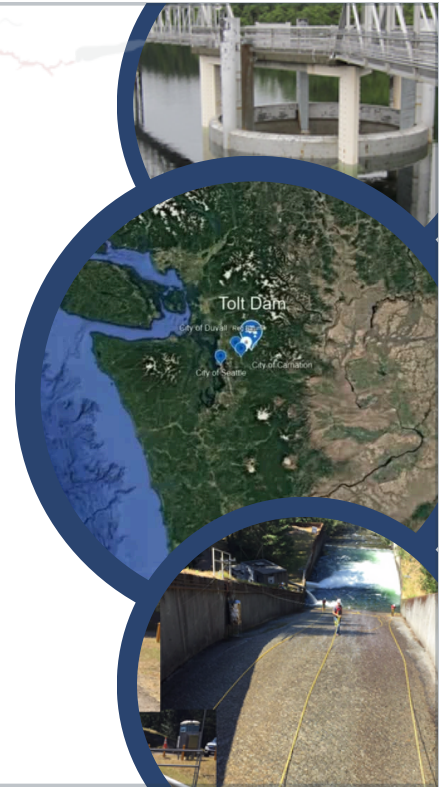
- ✓ About the Dam & Project
- ✓ Performing Beyond Regulatory Requirements & Why
- ✓ Collaborative Approach to Exercise Planning
- ✓ Exercise Design & Implementation - Um, you're different
- ✓ Benefits Realized
- ✓ Lessons Learned



Eric - describe the key points

THE TOLT PROJECT

- ✓ South Fork of the Tolt, earthen dam
- ✓ Built in 1958, in use early 1960s
- ✓ 57,900 acre-feet of water
- ✓ Located 16 miles from Carnation and unreachable by public
- ✓ Provides water for about 500,000 people. Eastside Cities, the North End of Lake Washington, and North Seattle.



Rachael - spend some time on the location of the dam and how the dam is not only for power but for water. explain the division of labor between SPU and SCL

THE TOLT PROJECT

- ✓ Generates power
- ✓ Provides flood control for downstream areas already in flood-prone locations
- ✓ Provides controlled temps and flow for salmon migration
- ✓ Monitored 24/7 by staff using instrumentation and cameras
- ✓ Inspected daily by Tolt Headworks Crew



Rachel continues to explain the dam and it's additional benefits

DAM EMERGENCIES



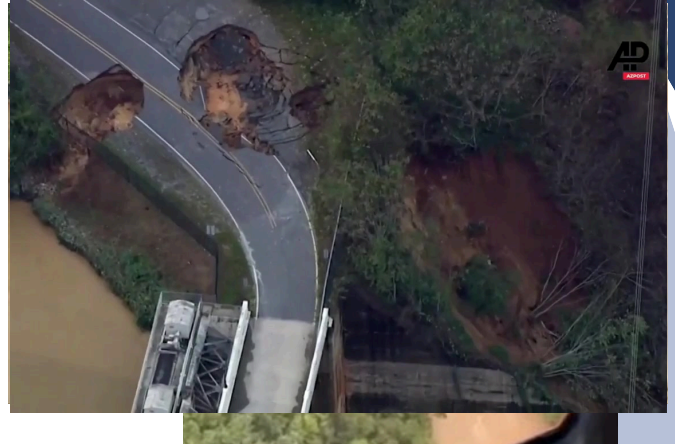
LOW PROBABILITY, HIGH CONSEQUENCE EVENTS:

While dam failures are rare, their impacts can be catastrophic, necessitating vigilant monitoring and maintenance.



RECENT DAM EMERGENCIES - 2024 HELENE

- Waterville Dam (1930), North Carolina: Reports of a catastrophic failure led to widespread evacuation orders
- Nolichucky Dam (1913), Tennessee: The Tennessee Valley Authority issued an imminent failure alert during Hurricane Helene, prompting evacuations
- Lake Lure Dam (1926), North Carolina: Heavy rainfall from Hurricane Helene caused overtopping, triggering mandatory evacuations. A full collapse was avoided



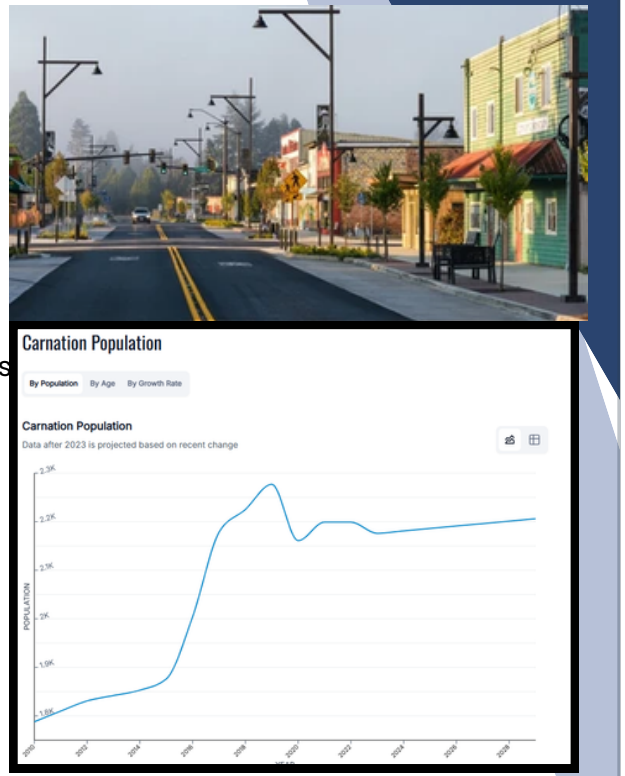
Rachael will explain the recent emergencies involving dams.

- Low probability high consequences of dam emergencies. life and property
- Explain the difference between these dams and the Tolt.
- Explain why it is important to have good plans and exercise.
- point out that none of these dam emergencies happened immediately without warning

TOLT DAM & THE COMMUNITY

✓ DEMOGRAPHICS

- Small cities
 - Carnation – pop 2,160 ↑ 3.7%
 - Duvall – pop 8,030 ↑ 28.1%
 - Unincorporated King County
- Population and growth exceeds King County's general growth rate
- Bedroom community & shifting economics from forestry, farming, and dairy toward services and tourism.



Carnation is closest to the dam and would potentially be underwater (worst case)

- Carnation would have 90-minutes to evacuate, worst case

Both cities growing at faster rate than KC as a whole

Also of concern – unincorporated KC – large area not served by local cities

Transition from loggers, dairy farmers, and hippies to a Tech bedroom community

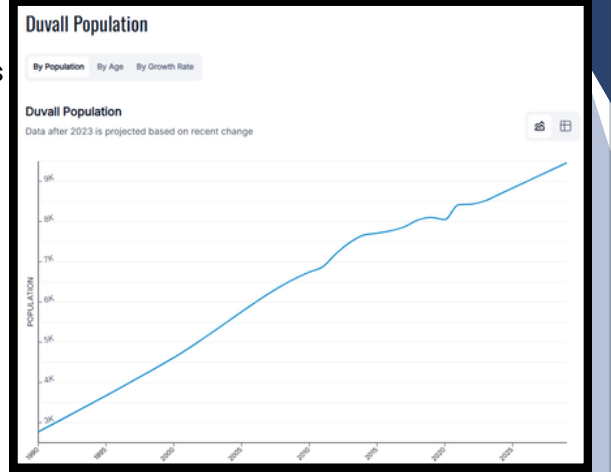
Many new residents unaware of the dam (and ANY valley hazards including seasonal flooding)

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TOLT DAM & THE COMMUNITY



COMPLICATED RELATIONSHIPS

- In July of 2020, the original siren system triggered unexpectedly.
- Additional concerns during the replacement process
- Isolated nature of the dam increases concerns
- Relationships established during the 2019 functional exercise



Slide 9

The dam is surrounded by Seattle-owned watershed, access is through private and tribal-owned forest land. There is very limited public access, most people are unaware of the dam

It's also considered critical infrastructure, public info is limited

There was a dam failure warning system in Carnation for years, it would sound every Wednesday. Most people – it had become routine (unless you were new!)

In July 2020 the siren system malfunctioned and sounded

The malfunction - and some subsequent issues when Seattle was building a replacement siren system – has brought a dramatic increase in attention to the dam and potential hazards. Threats of lawsuits, public meetings. Reduced trust

** one benefit of past exercises (2018-2019) as the DC and EM with Duvall KCFD 45 was that problems occurred, we knew who to call with Seattle – and trusted we would get honest and prompt responses

TOLT DAM & THE COMMUNITY



GEOGRAPHY

- Unique geography
- Limited area access
- Frequent flooding
- Downstream locations are at risk.
 - Carnation has 90 minutes to evacuate in the worst-case scenario.

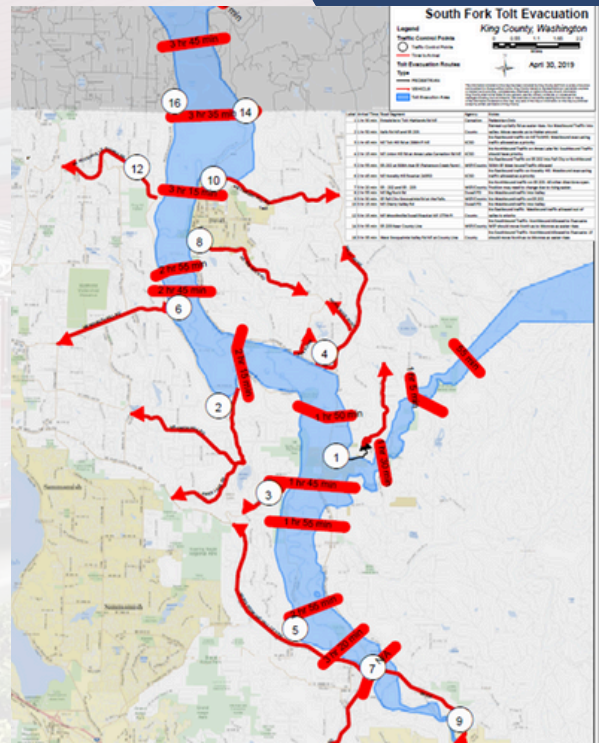


Slide 10

- ** Key point – there are only a few roads in/out of Carnation, Duvall and adjacent areas of unincorporated KC east of the Snoqualmie River
- ** one or more of these roads are closed multiple times/year by seasonal flooding.
- ** every 5-10 years, ALL Road Access is blocked by flood waters (NO road access in/out of these areas)
- ** In worst-case dam failure, the only four roads in/out of these towns could be destroyed, trapping potentially thousands of people.

SNOWQUALMIE VALLEY INUNDATION & IMPACTS

- ✓ Inundation
- ✓ Isolation
- ✓ Initial response
 - No regional response plan
- ✓ Then what?



Slide 11

Many variables effect scale of a failure (season, river levels, reservoir levels, and more)

Worst case – all roads underwater and potentially destroyed

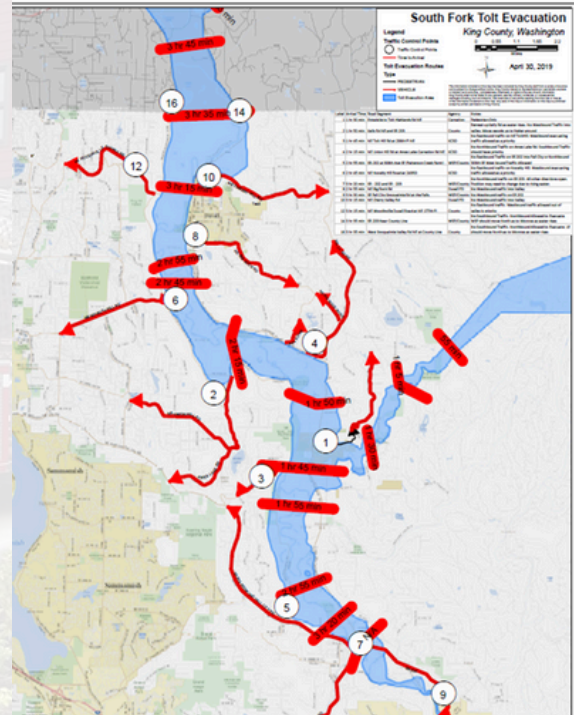
Water flows west down the Tolt River

- intersects with the Snoqualmie in Carnation
- floodwaters backup/flow upstream /south to Fall City
- most floodwaters flow north/downstream towards Duvall and Monroe

When I first got involved with planning for a failure of the Tolt Dam, I was surprised to learn there was NO regional response plan

EXISTING EMERGENCY RESPONSE PLANS

- ✓ Riverview SD Evacuation Plan
- ✓ Duvall & Eastside Fire Plans
- ✓ King County OEM Plans...
- ✓ City of Seattle EAP
 - Requires exercise



Slide12

RSD – is the best prepared of the downstream agencies. .

- Maybe 2,000 students in Carnation
- Annual evac ex

During my time with Duvall KCFD 45 – I created a” checklist” plan

Have done the same with Eastside

KCSO – I believe ... not a specific dam failure plan, but a general all hazards plan

KC OEM – an all-purpose county wide evac plan,

Seattle EAP

- Outlines monitoring and notifications
- Regular outreach
- And exercises

Rachael - talk about the basics of the plan, particularly the activation levels and how the flow charts work. and the exercise schedule.

WHY EXERCISE - REVIEW

- ✓ Validate plans and procedures
- ✓ Identify gaps and areas for improvement
- ✓ Build confidence and competence
- ✓ Help build relationships
- ✓ Strengthen coordination and communication
- ✓ Test equipment, systems, and tools
- ✓ Meet regulatory requirements



Eric - Go over the components of HSEEP and how it creates constant improvement.

Talk about why we are doing this exercise. Explain that building relationships is the most important part and why.

Point out that meeting regulatory requirements is last on this list. Explain that regulators mainly require exercises to meet the minimum, but force a process that does the other items.

Mention that you get back what you put into the exercise.



Eric - Explain the agencies on the planning team and why they were important.

Explain that these are the trusted agents and not players.

Talk about the meeting frequency 2 times per month IN PERSON in Duvall.

Duvall represented the RSD.

EXERCISE PLANNING OBJECTIVES

- ✓ **BUILD RELATIONSHIPS THROUGH ENGAGEMENT**
 - This was the planning team's over-arching objective
 - Force communication during the exercise
- ✓ **MEET INDIVIDUAL AGENCY OBJECTIVES**

Each agency has specific internal goals for the exercise.
- ✓ **HAVE FUN**

It wasn't about having fun it was more about lowering stress so people could relax and focus on the exercise.
- ✓ **AVOID PREVIOUS EXERCISE AAR FINDINGS**

Previous exercise created unwanted down time because of the scenario
- ✓ **MEET REGULATORY REQUIREMENTS**

Test the EAP



Explain that the first meeting was all about objectives.

The primary objective was building relationships.

It was important to have the exercises in the community to both improve realism but also to spend time and money in these areas.

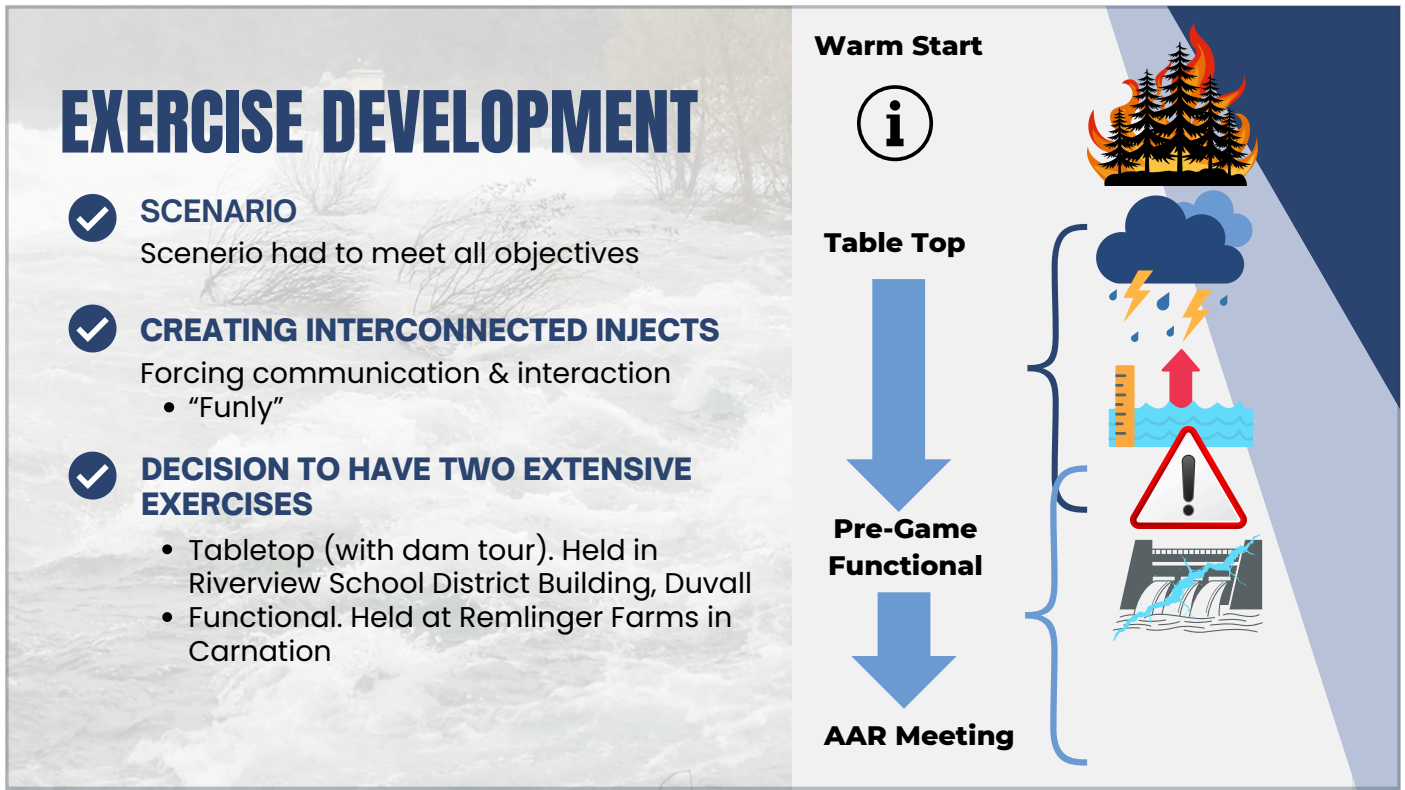
Next, each agency provided its own objectives. These are things that they wanted to test/exercise within their own agency.

We decided early on that having a fun and relaxing, somewhat extensive tabletop exercise would help us build relationships in a more relaxing environment.

Explain that we wanted to avoid the problems found during the last exercise.

We did this by having a dual timeline and also by having a more extensive tabletop ex.

And last was we needed to meet the regulatory obligations.



Eric

Explain the general exercise progression and scenario.

wildfire

storm

issues in the entire valley/region

Pre-failure Emergency (Potential Problem) Chart-2

Imminant failure

DISCUSSION BASED TABLETOP

- ✓ Scenario-injects escalate challenges and force interactions
- ✓ Players received information through presentations and individual injects
- ✓ Collaboration was encouraged at the start and required during play. People had to move around to gather and share information.
- ✓ Groups reorganized during the exercise to represent functional working conditions better.
- ✓ Allowed for flexibility and artificialities to keep exercise moving



Eric

Talk about the way we handed out information.

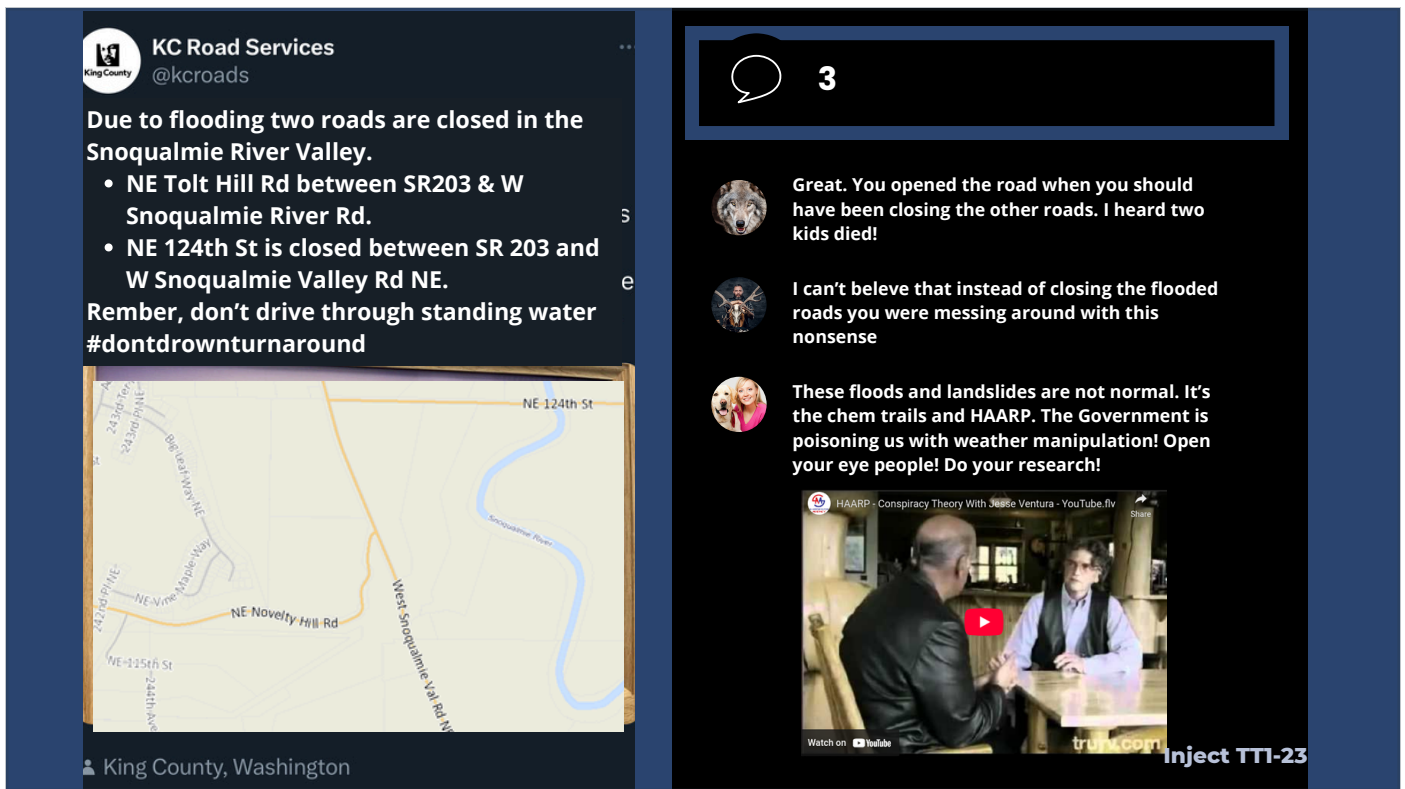
Explain that the injects were developed to meet all of the agency's objectives.

Give an example of Duvall PW and the pickle.

Explain that there was extensive pressure on players to speak with one voice and address misinformation. This forced public communications roles to confirm, verify, and develop information and information products.

Explain that we gave ourselves flexibility during the tabletop to keep things moving. We also used our ability to change decisions based on the player's response. Give an example of the RSD canceling school and how that would have really caused the exercise to not meet all objectives.

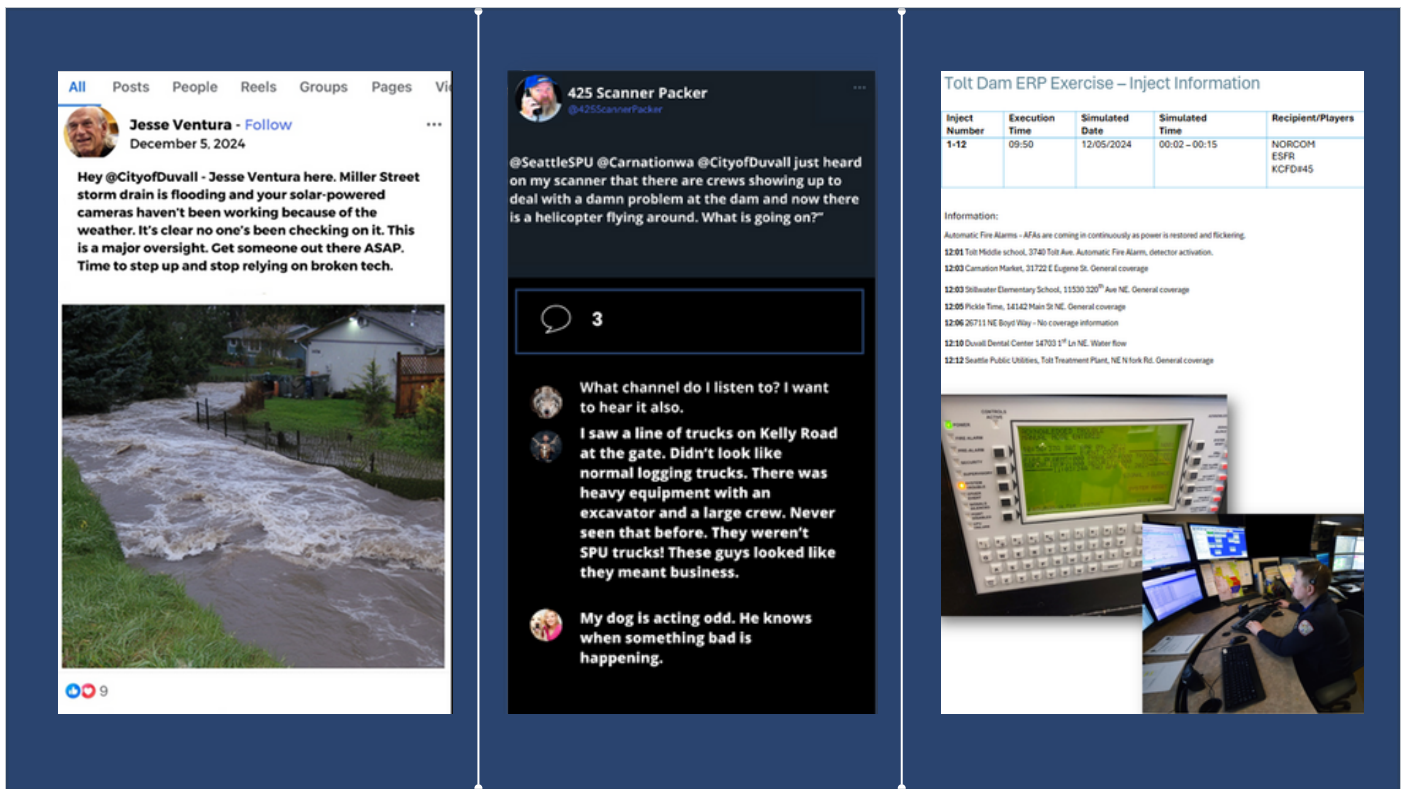




Explain how we used injects as simcells and also showed the comments that would be associated. This forced some level of social media monitoring and message development.

We had fun with this process.

This is a perfect example of misinformation in the comments.



More examples of social media having both misinformation and actionable information. We didn't want people to ignore these injects. They needed to analyze them and dig a bit deeper.

The scanner inject is a good example of how an agency may see some information and need to verify what is occurring with another agency.

The last inject is a good example of the non-dam related types of issues that will be happening during a storm event. This brings realism to the exercise. This was also an inject that forced the dispatch center and the fire department to activate a specific plan. Their agency exercise objective

ENDING THE TABLETOP WITH A QUESTION

You receive the following message:

This is an exercise. This is _____ from _____ SPU has activated notification Chart Two, Potential Failure of the South Fork Tolt River Project Emergency Action Plan. Project Personnel judged that a Potential Failure condition is developing within the Project which could affect the integrity of the Tolt Dam. Please refer to your copy of the Tolt EAP and implement the appropriate notification procedures or response actions as outlined in Notification Flowchart two. This is an exercise.

REPORT OUTS

- Based on the information so far, what challenges would your agency face?
- Which agencies would you be collaborating with, and at what level? Which agencies are you currently communicating with? Which agencies do you expect to be in communication with you?
- What actions are you taking in response to this information?
- Are you conducting any internal communications with your staff?
- What written plans are you referencing or using?
- What resource needs might you encounter, and how would you address them?

2024 SNOQUALMIE VALLEY TOLT EXERCISE INCIDENT MANAGEMENT COMMUNITY FIRST

We ended the tabletop with a chart 2 notification. The issue with the notification is the script is built to meet the needs for all potential failure issues.

In this case, it was simply a log boom that had broken, and there was minimal threat, but the plan required this call.

This last inject was revealing to the players and had an unexpected outcome for the planners.

We had intended on starting the functional exercise with a simulated press briefing. That was not what would really happen in this case.

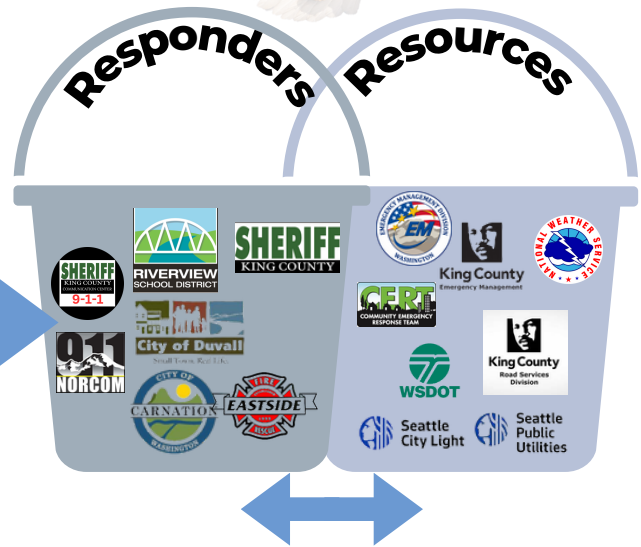
We could tell that everyone had one need at the end of the tabletop, and that was INFORMATION.

The tool for sharing information is the EOC.

We had to pivot as planners and start the functional exercise with an EOC briefing.

FUNCTIONAL EXERCISE

- ✓ Starting the with next day KCOEM Briefing
- ✓ Dual timeline then merge
- ✓ Simcells, call every 2 minutes (152 injects)
 - KC 911
 - NORCOM
 - Riverview SD
 - City of Carnation
 - City of Duvall



Explain that the functional exercise is different than a table top. You build it, start it, and the players navigate it. There is very little room for changes on the fly. It's a really nerve-racking process compared to the tabletop, where you have some control.

Explain that we had a dual timeline at the beginning of the exercise during the EOC briefing. SPU Operations was simulating a day ahead to prevent the downtime identified in the AAR from the last exercise. Explain the problem that occurred with this.

Explain that the information was largely coming from a room of simcell callers. With over 152 different injects and about a call every 1-2 minutes coming out of that room.

Lastly, explain that most simcell calls were to response agencies and the others would be getting their work/info from responders.

SIMCELL INJECT EXAMPLE

Inject Number	Execution Time	Simulated Date	Simulated Time	Event Description	Inject Type & Method	Recipient Player	Controller Simcell	Expected Outcome or Action
5	9:00	9-Dec		(To the transportation office) Hello, this is (one of the mechanics), I wanted you to know the WSP just showed up for their annual school bus safety inspection	Phone Call	Riverview SD	School Dist. Callers	
8	9:20	8-Dec	13:00	Phone call from KIRO News requesting information on what is happening at the dam. Specifically: What are the concerns that SPU is facing because of the log boom breaking. What should people who live below the dam be doing now? How will people be notified if the dam breaks? Should people be concerned? What is SPU doing to solve the problem?	Phone Call	SPU PIO	Reporters & Media	Media questions should be answered and there should be a coordinated response to overlapping questions about dam failure notifications and what actions the public should be taking right now.
9	9:30	8-Dec	13:20	Phone call from Q-13 News requesting information on what the city of Carnation is doing because of the issue at the dam. What should people who live below the dam be doing now? How will people be notified if the dam breaks? Should people be concerned? Is there any other relevant information you want to share or you would like the community to know?	Phone Call	Carnation PIO	Reporters & Media	Media questions should be answered and there should be a coordinated response to overlapping questions about dam failure notifications and what actions the public should be taking right now.
10	9:40	8-Dec	13:30	Phone call from KOMO. We've heard that King County Emergency Management is coordinating with agencies in the region regarding the problem at the Tolt Dam. What does that mean? What should people who live in the path of flood waters be doing right now? How will people be notified if there is a bigger problem at the dam? Is there anything else you want to relay to the public about this issue.	Phone Call	KC OEM PIO	Reporters & Media	Media questions should be answered and there should be a coordinated response to overlapping questions about dam failure notifications and what actions the public should be taking right now.
11	9:45	8-Dec	16:00	KCOEM - PH Coordination Call / RE Chart 2 activations Report outs will include updates, what actions the agency has taken, and resource needs.	Simulated Phone Call	All Players	Lead Controller	
13	10:15	9-Dec	9:30	You hear crashing noises coming from the north part of the lake. It sounds like the landslide you heard earlier, but it lasts a lot longer. You can see trees falling over in the distance and a barren area forming near Rainbow Creek. About 3 minutes later there is another screech wave but this time it washes over the south part of the dam face washing out the dam access road and sending an unoccupied SPU vehicle over the face of the dam.	Inject Packet	Tolt Headworks	Exercise Controllers	Chart 3 Activation - Hold sharing information until PH conference call is completed
14	10:20	9-Dec	9:30	The downstream staff gage is now fully submerged (over 7 feet), and cameras are showing muddy water with high flows.	Inject Packet	SPU Control Center	Exercise Controllers	Chart 3 Activation - Hold sharing information until PH conference call is completed
	10:22	9-Dec	10:00	You are near the Villa House and see a low spot in the dam crest on the south side of the dam with water flowing over the dam. You notice that walkway bridges to the morning glory spillway have fallen into the reservoir. The breach at the dam crest is increasing in width and the amount of water flowing through the breach is increasing.	Inject Packet	Tolt Headworks	Exercise Controllers	
16	10:25			Chart 3 notifications	Players	All Players	Exercise Controllers	See chart 3 notification process. SPU ORC makes calls, SPU Control Center makes calls, SCL Makes Calls, KCOEM sends out notifications.
17	10:25	9-Dec	9:30	Time jump for all players. It is now 9:30 AM on December 9th.	Presentation	All Players	Lead Controller	
15	10:25	9-Dec	9:40	Hey I got your phone number from my cousin who runs the Facebook page for a community group in Carnation. Is this a real dam failure? My farm is just north of the city of Carnation on HWY 203.	Phone Call	SPU Control Center	All Others	
18	10:28	9-Dec	9:40	Have you heard if this dam failure thing is real? I live in Monroe and need to know if the roads are going to be closed when I get off work.	Phone Call	Redmond 911	911 Caller	If Redmond police dispatch has received the Chart 3 notification, they can confirm that this is "real" for road closures, recommend caller check county and state road alerts
19	10:30	9-Dec	9:42	Hey I can't tell if this alert is real or not. Should I be evacuating from the Girl scout Camp in Carnation? My phone went off telling me I should go.	Phone Call	NORCOM	911 Caller	If NORCOM has received the Chart 3 notification, they can confirm that this is "real"
20	10:30	9-Dec	9:45	Hola, mi número es Ronaldo Tujillo, mi hijo está en segundo grado, ¿dónde puedo encontrarlo?	Phone Call	Riverview SD	School Dist. Callers	Does district office have a Spanish speaking staff member nearby to assist? RSD provides consistent message to relay regarding student reunification.
21	10:35	9-Dec		King County Air Support is calling in and advising that weather is preventing them from flying right now but it looks like it might clear up. Are air resources needed and what type (Guardian 1 or	Inject Packet	SPU ORC	SPU ORC	Relay information to the deputies on the ground. Deputies or command

Point out that building these inject took a great deal of time.

Explain the
execution time, event description/script
delivery method
simcell delivering
and expected outcomes

Injects were mostly divided into two categories. The chaos of an event (background) and actionable items (highlighted in green). Give a quick example.

Again, there were 152 injects.

INITIAL KEY ACTIONS BY AGENCY



just give a general overview of what the agencies were doing and how the roals changed during the exercise.

role one was before the dam broke.

focused on information sharing. SPU and SCL were the responders at the dam.

RESPONSE KEY ACTIONS BY AGENCY



After the failure notification, SPU and SCL became resources (information) and the response roles shifted. Give a brief example of what each agency was doing.

EXERCISE KEY OBSERVATIONS

- ✓ Exercise started with dual timeline
Information is key
- ✓ Initial KC-EOC briefing benefits were extraordinary
- ✓ Quick establishment of JIC was very important
- ✓ Relationships
 - By design
 - By incident structure
 - By response needs



Eric Greg Rachel

Give a quick overview of what we observed during the exercise.

LESSONS LEARNED

- Objectives were accomplished
- Use the JIC/JIS Proces – One voice
- Understand local geography
- Reliability beyond institutional knowledge
- What does potential vs imminent mean?
- Plans
 - Make them
 - Improve them
 - Test them
- Evacuation routes and DESTINATIONS.



Eric Greg and Rachael

Overview of lessons learned.

Eric
JIC/JIS success

Greg
Reliability beyond institutional knowledge

Rachael
Potential vs imminent issues

Greg
identified that agencies need to have individual plans, or make improvements, and then to test those plans within their agencies.

Talk about the discussion on the evacuation destination and not overwhelming the soon-to-be island community of Duvall

All - Why was this a positive experience in your words?

QUESTIONS



THANK YOU



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