Mossyrock Dam/Riffe Lake Update

Generation Manager Pat McCarty

Mossyrock Community Center

March 3, 2017
AGENDA

- Overview
- Background
- Seismicity
- Current risks
- Temporary risk reduction methods
- Path forward
- Questions
TACOMA POWER OVERVIEW

- Four hydroelectric projects
- Seven dams
  - Licenses provided by the Federal Energy Regulatory Commission (FERC)
- Publicly owned since 1893
  - Must collect enough revenues to equal expenses
  - Receive revenues mainly through wholesale/retail sales

Our top priority is safety
BACKGROUND

Cowlitz River Project
COWLITZ RIVER PROJECT

Mayfield Dam
Forms 13-mile-long Mayfield Lake

Mossyrock Dam
Forms 23-mile-long Riffe Lake
FERC OVERSIGHT

- Regulated by the Federal Energy Regulatory Commission (FERC)
- Currently licensed through 2037
- Dam safety program
  - Daily/weekly/annual inspections
  - Five-year review (Part 12)
    - Independent consultant
    - Potential failure mode analyses
    - Review current standards
      - Hydrometeorological reports
      - Updates to USGS seismic hazard maps
SEISMIC PATH

Seismicity: “The occurrence or frequency of earthquakes in a region.”

- Been looking at seismicity for years
- Made improvements; developed plans for spillway piers
- Got to the point of designing modifications to the piers
- New seismicity numbers were released by USGS
- Higher numbers required new structural evaluations; back to the drawing board
- The USGS numbers that are used to calculate potential seismic impacts have increased multiple times between 2001 and today.
# Earthquake Factors

- **Magnitude** (Richter or Moment Magnitude Scale)
- **Depth**
- **Distance from the epicenter**
- **Local geologic conditions**
- **Duration**

\[ = \text{Resulting Peak Ground Acceleration} \]
MOSSYROCK SPILLWAY PIERS
MOSSYROCK SPILLWAY PIERS

90 feet

65 feet
MOSSYROCK SPILLWAY RISKS

- PIER AND GATE FAILURE
  - If piers fail, gates may fail
  - Uncontrolled release of water
<table>
<thead>
<tr>
<th>Elevation (in feet)</th>
<th>Amount of water released (cubic feet per second)</th>
<th>Equivalent number of gallons per second</th>
</tr>
</thead>
<tbody>
<tr>
<td>749</td>
<td>60,000</td>
<td>448,800</td>
</tr>
<tr>
<td></td>
<td><em>(Flood of Record level released from Mayfield Dam)</em></td>
<td></td>
</tr>
<tr>
<td>755</td>
<td>85,000</td>
<td>635,800</td>
</tr>
<tr>
<td></td>
<td><em>(Olympic-sized swimming pool = 660,430 gallons)</em></td>
<td></td>
</tr>
<tr>
<td>760</td>
<td>112,500</td>
<td>841,500</td>
</tr>
<tr>
<td>778.5</td>
<td>230,000</td>
<td>1,720,400</td>
</tr>
</tbody>
</table>

1 cubic foot per second = 7.48 liquid gallons per second

Size of one basketball
RISKS AT ELEVATION 778 FEET

- EXPECTED RESULTS (IN GEOGRAPHICAL ORDER)
  - Flooding of Salmon Hatchery
  - Overtop and destroy Barrier Dam
  - Flooding of local homes
  - Flooding of Trout Hatchery
  - Flooding parts of Toledo, Castle Rock, Kelso and Longview
PROPOSED RISK REDUCTION PROCESS

• **12/06/16**: Received FERC letter asking for interim risk reduction methods

• **12/21/16**: Received FERC letter requiring us to convene an independent Board of Consultants to evaluate seismic hazards

• **02/07/17**: Submitted plan to FERC that proposed modifying Riffe Lake summer elevation to 749 feet

• **02/14/17**: Publicly announced Riffe Lake elevation plan

• **??/??/??**: FERC responds
Selection of the Board of Consultants

FERC approval of earthquake loads

Structural modeling of the dam

Additional sub-modeling of the spillway piers

Structural design of the selected alternatives (piers and gates)

Development of structural alternatives

FERC approval of the modeling results

Stability modeling and calculations of the left wing wall

FERC approval of the final designs

Bidding and award of construction contracts

Construction of selected alternatives
PATH FORWARD - RECREATION MOSSYROCK PARK

PROPOSED NEW SWIM BEACH AND BOAT RAMP MODIFICATIONS

- State Environmental Policy Act (SEPA)
- Shoreline permit
- Hydraulic Project Approval
- Army Corps of Engineers permit
- FERC approval
- Site construction
CAMPING RESERVATIONS

- Emailed 1,079 people with reservations at Mossyrock Park on Feb. 22.
- Between Feb. 22 and March 2, there were only 11 cancellations (1%)
- 150 more reservations at Mossyrock Park than were in the system at this time in 2016
RECREATION – CULTURAL RESOURCES

“There is one positive aspect here. I had the day off and after only a couple of hours found more arrowheads and fishing lures than I would have with a full lake. Might turn into quite the tourist attraction to go out arrowhead hunting.”

– comment posted 02/24/17 on Lewis County Sirens.com (Riffe Lake article)

- FERC license requirement to protect cultural resources.

- We expect that FERC will ask for a mitigation plan and schedule as to how we’ll further protect the resources.

- Not a tourist attraction; still unlawful to remove minerals, wood and artifacts from the Cowlitz Wildlife Area and Tacoma Power lands without authorization.
FISHERIES – RIFFE LAKE

- Not an actively managed fishery
  - Resident coho
  - Washington Department of Fish and Wildlife

- Continue to stock 100,000 rainbow trout between Mayfield Lake, Swofford Pond, South Lewis County Park Pond and Lake Scanewa annually.

- Looking into other potential stocking opportunities, but no decisions have been made yet.
EMERGENCY NOTIFICATION SYSTEMS

- We have been testing our siren system annually for the past five years.
- This year, for the first time (unrelated to these changes), we will conduct a coordinated test with the Lewis County Department of Emergency Management.
- Test will be at 11 a.m. on Wednesday, April 5.
  - Siren test (Ike Kinswa State Park, Mayfield Lake Park and the Cowlitz Salmon Hatchery)
  - Lewis County alert notification system test: Sign up at lewiscountywa.gov or call (360) 740-1157 to register for the notification system (which has replaced “Code Red”)

TACOMA POWER
TACOMA PUBLIC UTILITIES
RESOURCES

- Get updates at MyTPU.org/RiffeLake
- River flow and lake level information: MyTPU.org/lakelevels
- Email cowlitz@cityoftacoma.org
QUESTIONS