Trip report - The Dalles Dam - Feb. 23, 2015.

Visual observations of modified Fish Unit and ladder entrance operations with reduced flow.

Attendance:

Bob Cordie – OD-D
Pat Duyck - PM-FP
Karen Kuhn – EC-HD
Jon Rerecich – PM-E
Scott Bettin - BPA

A. FPOM coordination form 15TDA01, TDA-E 1400 cfs test, was coordinated by OD-D and approved at the 2/12 FPOM. The objective was to modify normal ladder operations and reduce a single fish unit flow (Max. flow capacity single unit = 2500 cfs) to 1400 cfs to visually observe the east ladder entrance head, junction pool flow conditions, and conditions in the collection channels. The ladder flow from the exit to the junction pool is approximately 100 cfs with 1.0 ft over the weirs. PLC readings were taken at the junction pool control box and visual observations made from tailrace deck level during four operations starting around 1300 hrs:

1. **Operation 1** – Fish Passage Pan (FPP) Standard ops - East, West, and South entrances open.
2. **Operation 2** –Modified fish units ops – East entrance open, West and South entrances closed.
3. **Operation 3** –Modified fish units ops – East entrance opening increased, West and South entrances closed.
4. **Operation 4** –Modified fish unit ops – JP2 and JP4 lowered, No East entrance changes, West and South entrances closed.

Table 1 - East Entrance observations and modified operations

East entrance observations	**Operation 1**	**Operation 2**	**Operation 3**	**Operation 4**
Fish unit flow (cfs)	4860	1400	1400	1400
Channel entrance elev. (ft)	81.9	81.5	81.2	81.2
Tailwater elev. (ft)	80.2	79.5	79.7	79.7
Entrance Differential (ft)	1.7	2.0	1.5	1.5

E1 gate open (ft)	2.9	0.0	0.0	0.0
E2 gate open (ft)	11.9	8.5	10.7	10.7
E3 gate open (ft)	11.9	8.5	10.7	10.7

B. Noteworthy observations and recommendations:

1. During Operation 2, slower velocities from the ladder weirs and through the junction pool to the ladder entrance were observed compared to baseline FPP ops. The south wall (angled) junction pool closest to the tailrace had the fastest velocity. Velocity was visually estimated at 1-2 ft/sec along the wall.

2. The forebay side of the junction pool had less velocity and a slight reverse flow was observed coming from the collection channel into the junction pool.

3. E2 and E3 were adjusted open after observations made during Operation 2 due to the 2.0 ft differential. Operation 3 had 10.7 ft gate openings and 1.5 ft differential, well within Fish Passage Plan criteria for east entrance gate operation and differential maintaining 8.0 ft or greater below tailwater with 1 – 2 ft head at entrances (1.5 ft optimum).

4. Operation 4 consisted of a lowering junction pool weir gates JP2 and JP4 to block collection channel reverse flow. The tailwater and collection channel elevations were too high to achieve a complete blockage. Approximately one foot remained opened on the bottom so the gate was fully lowered allowing flow over the top. Observations of velocity over the tops of the weirs with one foot openings were estimated at 2-3 ft/sec. Channel width is 17.5 ft.

5. Recommendation - Make observations of reverse flow and junction pool hydraulics during testing of the new backup AWS to determine if reverse flow is present. If so, determine severity and make recommendation for trigger (possibly based on estimated down time for both fish units) to close open diffusers at the west and south entrances. Continue flow observations. Duration to manually close diffusers is estimated at half a day.

Figure 1 - East entrance 2.0 ft differential, 8.5 ft gate open

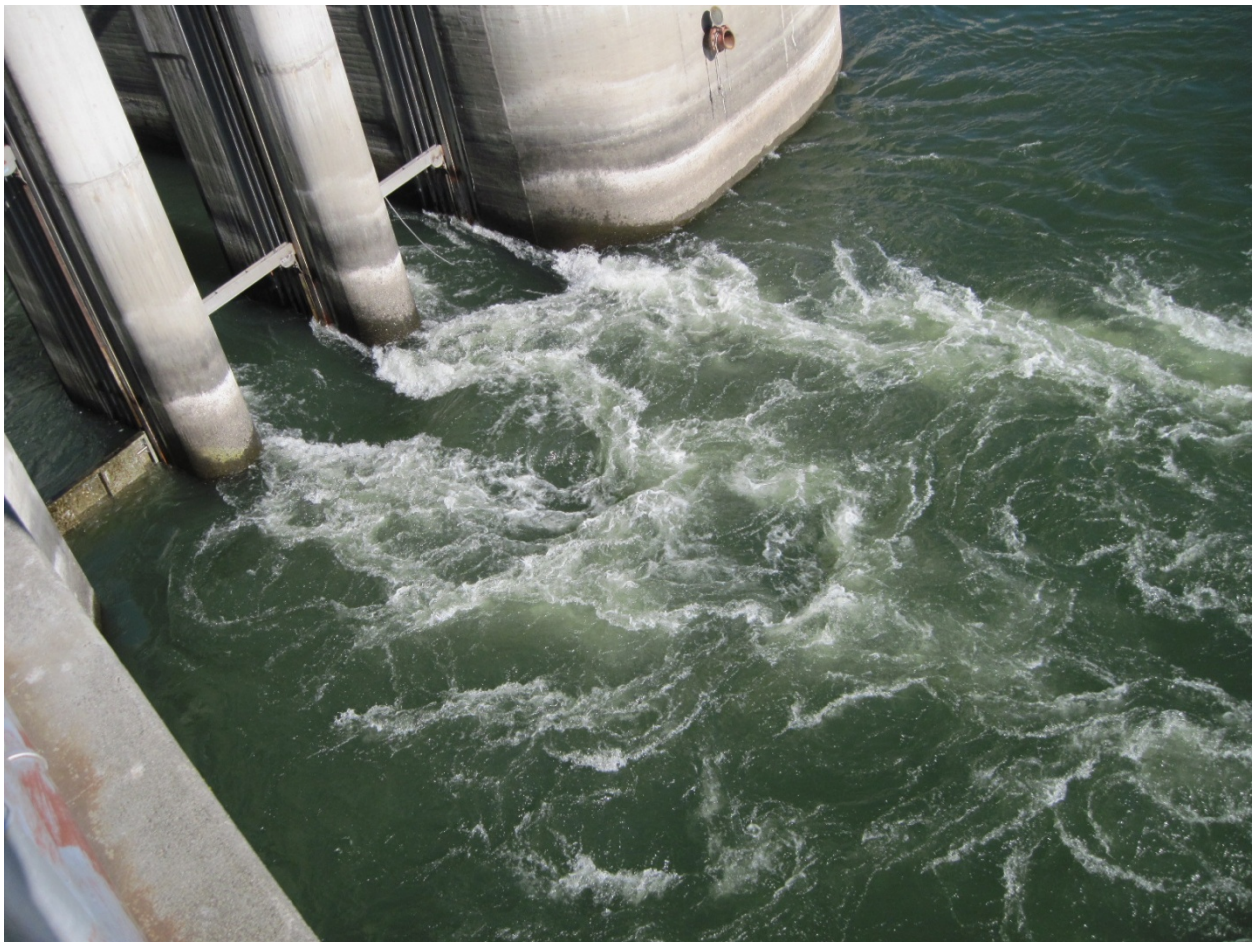

Figure 2 - East entrance 1.5 ft differential, 10.7 ft gate open