

MEMORANDUM FOR THE RECORD - 19 IHR 06

SUBJECT: South shore fish ladder upper diffuser valve repair

On April 14 at 0655 hours, the powerhouse operator found that the depth over the stationary weirs in the upper south fish ladder was 0.5'-0.7' below criteria (criteria 1.0'-1.3'). The upper diffuser valve #12 would not operate in automatic or manual mode to add more water. The valve stem was spinning, but the valve was not opening. On April 15, mechanics and electricians examined the valve actuator and valve stem, and suspected that the stem must have become disconnected from the valve. In order to access the valve, the project made plans to unwater the upper ladder down to tailwater level. At 1238 hours, all of the south shore auxiliary water supply (AWS) pumps were turned off to discourage further adult fish entry into the ladder. On April 16, the upper diffuser and ladder exit bulkheads were installed to begin unwatering. Too much water was leaking through the diffuser bulkhead, and crane problems prevented re-setting of the bulkhead to establish a better seal until April 17.

Personnel evacuated three adult steelhead and several thousand smolts from the upper ladder down to tailwater level on April 17. We estimated at least 75 smolts (mostly steelhead) died from stress and handling of the fish evacuation process. The water flow going down the ladder during fish evacuation had to be less than what is normally preferred, to be able to see fish in the turbid water. Some of the fish were handled in dip nets to direct them through ladder orifices, as that was the best means to get them evacuated with the poor visibility. Some fish were inevitably left behind at the picketed lead section and lower turning pool during evacuation with a seine and dip nets. A pump placed in the forebay was left on overnight to provide water to flush these fish down, but the fixed amount of water from the pump was less than what would have normally been provided from diffuser #12.

On April 18, project maintenance staff found that diffuser #12 valve stem was seized up at the connection to the actuator. This caused the valve stem keeper pin to break off at the valve. Mechanics cleaned the threads on the valves stem, lubricated the connection at the actuator, replaced the gearbox oil, and reconnected the stem to the valve. The ladder was watered up on April 19 and returned to normal operation at 1530 hours. The diffuser is currently operating properly in automatic mode.

The project plans to order new brass drive nuts and seals for the actuator, for replacement during the next winter maintenance period.

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