

MEMORANDUM FOR THE RECORD**SUBJECT: 23JDA04 MFR South Fish Turbine # 2 forced out of service.**

On 28 February the John Day South fish ladder was returned to service for the beginning of the adult fish passage season. Fish turbine pumps 1 & 2 were commissioned and put into service at 1500 and the adult ladder was meeting all FPP requirements. On the morning of 1 March mechanics and operators, during routine inspections, noticed excessive vibration coming from fish turbine pump # 2 (Fig1). It was determined the pump was unsafe to operate and that continuing would cause significant damage. Therefore, the pump was forced out of service at 0930 on 1 March.

John Day maintenance is dropping bulkheads into South fish turbine pump #2 to dewater the unit and investigate the vibration issue. The pumps lower guide bearing was repaired this past July and the vibration may be the cause of another failure. However, that has yet to be determined.

John Day fisheries have adjusted the South fish ladder per the FPP's one turbine operation. Floating orifices are being pulled and South fish turbine 1 will be run at its maximum output allowable to provide attraction water.

Updates on weir setting, entrance differentials, and channel velocities will be forthcoming.

Future and Preventative Measures – John Day maintenance is investigating vibration issue by dewatering fish turbine 2. Once the issue is determined a path forward will be planned.

UPDATE: 3/6/2023

John Day maintenance has determined the cause of the vibration to be excessive wear on the lower guide bearing on the pump assembly of South fish turbine pump #2. The bearing was pulled out and journaled to reattach Teflon guide strips (Fig2) for the intermediate propeller shaft. Currently the bearing is being reattached to the pump assembly and the fish turbine pump is expected to return to service by 9 March.

Current ladder operation is following the FPP guidelines for 1 turbine operation. South entrance weir 1 and North Entrance weir 2 are submerged at 8'. Ladder entrances are within the 1'-2' range and within FPP criteria. Collection channel velocities are averaging 1.7 feet per second in the South fishway. South fish turbine pump #1 output is set at 68 rpms.



Fig 1: John Day South Fish Turbine Pump #2



Fig 2: Lower guide bearing disassembled

Sincerely,
JD Project Fisheries

230309 FPOM comments –

3.2.1.13. 23JDA03 and 04. JDA-S fish turbine pumps 2 and 3 OOS.

- 3.2.1.13.1 Grosvenor reported that the gear box manufacturer was on-site and gave the Fish Turbine #3 gear box a quick look. They provided a report so JDA now has a better understanding that the problem is related to the bearings. Philadelphia gear is working on alternatives to replace the bearing. The work is beyond the Project's ability. JDA is working on a plan and funding.
- 3.2.1.13.2 Fish Turbine #2 had been maintained and RTS during the summer of 2022. This winter the mechanics noticed excessive vibration and suspected a failure of the lower guide bearing. When returning to service, the shaft failed the swing test so the unit has been disassembled with a RTS date sometime after next week.
- 3.2.1.13.3 South Fishway. Two entrances are open at JDA-S. Collection Channel and entrance head is within the FPP criteria. Fish Turbine #1 is currently at max operation. Lorz asked about the RTS date for restoring the fishway to FPP entrance opening criteria. Grosvenor said JDA would have only one fish turbine for the next couple of weeks. He anticipates several months before fish turbine #3 returns to service. Grosvenor said JDA believes the shaft is worn out and doesn't realign with the guide bearing. Replacement of the propeller shaft is halfway to an overhaul and very costly. Lorz asked if there has been thought of mimicking the north shore for AWS water. Morrill asked about the cause of fatigue. Grosvenor believes it is just age. Conder asked about the visual condition of the fishway in the current configuration. Grosvenor said the fishway has one entrance at the north end closed, other is submerged 8'. Two entrances at the south end are submerged 8'. Conder asked if this operation has been looked at in the past and what was found. Grosvenor said JDA has operated in a similar manner. There wasn't conclusive results as to whether or not fish were negatively impacted. That was only a three-week outage though.