

MEMORANDUM FOR THE RECORD

SUBJECT: 23JDA03 MFR South Fish Turbine #3 out of service

During an oil change of the gear box of South fish turbine #3, metal shavings were found in the filter. Upon draining 70 gallons of oil from the gearbox to inspect the gears and bearings, additional metal shavings and fragments were found on the bottom of the gearbox(fig1). Representatives from the Philadelphia gear company inspected the gear box on 22 February and determined the input shaft gear bearing to be the cause of the metal and recommend it be replaced before more significant damage occurs to other internal components.

John Day project will finish maintenance activities on South fish turbine #3 and return it to service as a reserve pump in the event South fish turbine pumps 1 or 2 fail during the passage season.

- A. Future and Preventative Measures – Estimates of repairs will be provided by Philadelphia gear company. The type of repair is beyond JD projects capabilities.

UPDATE: 3/6/2023

Upon review of recommendations from the Philadelphia gear company and concurrence from JD project maintenance staff, South fish turbine #3 will be forced out of service until repairs can be made to the input shaft bearing in the gear box. It's determined that the gearbox is too unsafe to operate in its current condition and operating it will cause more permanent damage to the internal gearing of the gearbox and could eventually catastrophically fail.

An inspection team from Philadelphia gear will be on site 11 March to scope out repair options to the gearbox. Once a quote is prepared and an option selected, JD project staff and NWP will prepare a UFR for emergency repair to return South fish turbine pump #3 ASAP.



Fig 1: Metal fragments pulled from gearbox

Sincerely,
JDA 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.