**CENWP-OD-J June 2, 2022**

**MEMORANDUM FOR THE RECORD**

**SUBJECT: 22JDA08 South Fish Turbine Pump #1 temporarily out of service**

At 1928 hours on 1 June south fish ladder turbine pump #1 tripped out. After the initial trip the unit was reset, ran, but tripped out again. It was then reported that the gearbox thrust bearing housing and oil pump were extremely hot. Operations took pump #1 OOS, referenced the FPP, and adjusted the SFL for 1-turbine operation. Operations had to enter 1-turbine operation because fish turbine #2 was already OOS (see 22JDA03). Guidelines for 1-turbine operation per FPP are as follows.

**3.2.4.1.b.** If two turbines fail, operate the adult fish facility as follows until a fishway head of 1' is achieved:

**i.** Increase discharge of remaining unit to maximum capacity.

 The last remaining fish pump was increased from 68-RPMs to 78-RPMs.

**ii.** Close NE-1.

 NE-1 was closed.

**iii.** Leave NE-2 at a depth of 8’.

Operations didn’t have a good way to gauge this, but it was raised close to 8’. Fisheries personnel went out immediately the morning of June 2nd and used a tape to adjust this to 8’ deep.

**iv.** Close remaining floating submerged orifice gate entrances starting at north end.

 The floating submerged orifice gates (FOGs) are dogged off and out of the river.

**v.** Leave south powerhouse entrance weir (SE-1) at 8’ depth below tailwater surface.

 SE-1 was in “manual mode” and sitting at approximately 9’ of depth. As mentioned earlier operations doesn’t have a good way to monitor this. Fisheries promptly put SE-1 in “auto mode” which prioritizes an 8’ depth on the weir with keeping differentials in criteria. The differentials looked good.

**vi.** If criteria are still not achieved, reduce entrance weirs depth to 6’, then to 4’ if necessary, until more auxiliary water is available. Then reverse the above procedure.

Differentials are in criteria with SE-1 and NE-2 at 8’. Differentials will be monitored and if necessary, reduction in weir depths will be made to reflect the stated 6’ of depth.

After entering 1-turbine operation, the differentials for JDA SFL were all in criteria. However, the velocity was out of criteria (Current = 0.8-feet/second Requirement=1.5 - 4.0 feet/second).

**Resolution:**

The mechanical crew were able to restart pump #1 on June 2nd at ~0915. After observation they believe the thrust bearing to be in good working order and the extreme temperature observed to be normal operation. They will monitor the pump throughout the day for any changes in operation. To help minimize stress to the pump, fisheries requested that SFL pump #1 be reduced in RPMs from 68 to 65. Project staff will continue to monitor the pump output to ensure the fishway remains in FPP criteria.

After bringing the pump back online, equipment was returned to its previous state. Differentials and depths are within FPP criteria, and the channel velocity went from 0.8 feet/second to 3.04 feet/second.

1. Species
2. Origin – Unknown
3. Length – NA
4. Marks and tags – NA
5. Marks and Injuries found on carcass – NA
6. Cause and Time of Death – NA
7. Future and Preventative Measures – South fish turbine pump #1 needs an extensive overhaul. Any repairs made should be considered a temporary solution to the complete overhaul needed.

Sincerely,

JD Project Fisheries