

**OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND
MAINTENANCE**

COORDINATION TITLE – 18TDA10 AWS with single fish unit operation test

COORDINATION DATE – 10 Oct 2018

PROJECT – TDA-E AWS Backup

RESPONSE DATE- 24 Oct 2018

Description of the problem

The fish units are due for rehab. This may result in an entire year of operating with only one fish unit while the other is out of service. It is not possible to maintain full criteria operation with a single fish unit. There are short periods, dependent on tailwater elevation, when a single fish unit can achieve marginal criteria operation, however that is not dependable or maintainable.

With the near completion of the commission testing for the AWS backup, the question of compatible operation in conjunction with a single fish unit remains as an operation to keep the ladder closer to target criteria and minimize impacts to adult passage. This test is proposed for Nov 28, with Nov 29 as a contingency plan in case all testing is not completed.

Testing goals for the AWS backup and compatibility with one fish unit:

1. Close air valves and vents downstream of 7-foot valves and observe changes in in the ladder conditions (goal is to see if the air bubbles in Junction pool are reduced without adversely affecting conduit performance.)
2. Better confirmation of ladder entrance water level elevations and entrance head.
3. Joint operation of a fish turbine unit (FU) while operating the AWS.

Type of outage required - Both fish units will be out of service. Then one fish unit will be operated with the AWS to determine compatibility and hydraulic conditions.

Impact on facility operation – Adult Fish Facility Operating Criteria for TDA East ladder system during adult fish passage season.

Estimated configuration during testing during daylight hours –

1. Fish units off
2. AWS full open (~1400cfs)
3. Slowly ramp up a fish unit to full capacity (~2500cfs)
4. Monitor all entrance conditions during entire process.

NOTE: Please see The Dalles AWS Backup System DRAFT Testing Objectives and Test Plan at the end of this MOC for detailed plans.

Impact on unit priority – None for main unit operation

Impact on forebay/tailwater operation - None

Impact on spill – None. Spill for juvenile passage off.

Dates of impacts/repairs – Nov. 28 and Nov. 29, 2018

Length of time for repairs – Approximately 10 hours during daylight.

Analysis of potential impacts to fish

Per Fish Passage Center database - ten year adult passage average for Nov 28 and 29 respectively;

Chinook =14 and 11, Steelhead = 34 and 26, Coho = 3 and 2, Lamprey 0 and 0

Summary statement - expected impacts on:

Upstream migrating salmon – These dates are near the official end of the fish passage season. The fall returns are well below the 10 year average. The north ladder will be in service during testing. The fish unit outage will be intermittent with variable flows during the testing portion so attraction flow will be present during the day. It is likely that this test will have very minimal impacts to upstream fish passage.

Downstream migrants - There are no expected impacts since there are likely no downstream migrants near this location.

Upstream migrants Bull Trout – No impact. Very few bull trout have been counted at TDA in the last 10 years.

Lamprey – This is well past the lamprey passage period per Fish Passage Center data. There are normally numerous lamprey found during east fishway channel dewatering, however it is likely that these fish normally reside in these areas through the winter.

Comments from agencies –

From the October FPOM minutes-

The test will take place on 28 November. The plan is stop fish units, run the AWS then add a fish unit. CRITFC, NOAA and USFWS are supportive.

Final coordination results- This action will go forward as coordinated.

After Action update

Test was conducted according to the plan on Nov. 28. The fish turbines and fish ladder were monitored during the tests and showed no adverse conditions developed in either system. No seiching was seen in the fish ladder and no abnormal pressure variations were observed with the turbines. The flow in the fish ladder appeared similar to a normal operation with two fish units. Recorded channel velocities were also similar to a normal

dual unit operation. Flow results showed successful criteria operation was achieved with combination AWS and single fish unit at the east and west entrances. The south entrance was below 1.0 ft differential. Combined flow was estimated at 4050 cfs. There was considerable air entrainment in the junction pool area with AWS only operation. This was reduced with addition of the fish unit flow. The results of this test will help decide the direction of the fish unit rehab project.

Please email or call with questions or concerns.

Thank you,

Erin

Erin Kovalchuk
NWP Operations Division Fishery Section
Columbia River Coordination Biologist
Erin.H.Kovalchuk@usace.army.mil

Bob Cordie CENWP-OD-D
541-506-7800
Robert.P.Cordie@usace.army.mil

Jon Rerecich CENWP-PM-E
503-808-4779
Jonathan.g.rerecich@usace.army.mil

The Dalles AWS Backup System Testing Objectives and Test Plan
Tentatively scheduled for late November 2018 (Week of November 25)

DRAFT Version 1.a—10/04/2018

Objectives for the AWS PDT:

1. Confirm the ladder entrance data during our operations
 - a. The ladder entrance area has chronic calibration issues.
 - b. We will physically measure the approach channel, east Tailwater and entrance head during the tests.
2. Investigate reducing or eliminating the air bubble upwelling in the Junction Pool.
 - a. Close Air Vacuum Valves in 7-foot Valve Room if air suction is detectable.
 - b. If no improvement with air bubble upwellings: Close the 2 x 20-inch air vents after startup
 - i. Closing and opening the air vents is not a trivial matter as they are manual valves and one of them is behind a security fence.
 - ii. Reopen Vents and Air Valves before shutdown
3. Run for at least 1 hour so that we can obtain more visible and comprehensive daytime view of operations

Objectives for the Fish Unit Rehab PDT:

1. Run a compatibility test with a simultaneous operation of 1 fish unit and the AWS backup system

- a. Check for potential seiching or wave activity in the ladder or other operational concerns
- b. Evaluate overall fishladder operational capacity with 1 Fish Unit and AWS in operation
 - i. Assuming at least two entrance weirs set at least 9 submergence at all three entrance locations, does the system meet entrance head criteria?
 - ii. Are there slow channel velocities anywhere?
 - iii. Estimate total outflows based on:
 1. Reported Unit Flow + estimated AWS discharge
 2. Summation of Ladder entrance flow estimates
2. Run for at least 2 hours to allow for system oscillations and flow adjustments.
 - a. We can obtain more visible and comprehensive daytime view of operations
 - b. Allow entrances to auto-adjust if there is more confidence in the existing PLC.
3. Check for possibility of starting up AWS backup with one fish unit operating
 - a. This allows for smoother transition of fish ladder when one unit goes offline.

Recommended procedure:

1. Prepare AWS backup system for water-up
 - a. Open and close valves as needed prior to water-up per Section 4.1.2 of the O&M Manual
 - b. Connect and bleed pressure taps as needed
2. Initial fish ladder preparations
 - a. Log Fish ladder weir settings under full operation prior to testing.
 - b. Shut off both Fish Units
 - c. Raise entrance weirs at south and west entrances, above tailwater if possible
 - d. Set two East entrance weirs at 10-foot submergence, and one weir at 4 feet.
 - i. Settings based on median November tailwater conditions, subject to change pending actual conditions on day of testing
3. Water up AWS system (O&M Manual Section 4.1.2)
 - a. Open 7-foot Valves (BV7a and BV7b) simultaneously
 - b. After both valves are open, Check for air bubble upwellings in Junction Pool
 - i. Check for air suction at the Air Vacuum Valves in the 7-foot Valve Room; if air suction is present, close air valves.
 1. Check for any increase in cavitation noise at Orifices 3 & 4
 - ii. If main air upwelling is not sufficiently reduced, close the 2 x 20" air vents
 1. Closing the vents is not a trivial matter as the valves are manual and one is behind a security fence.
 2. Check for any increase in cavitation noise at Orifices 3 & 4
 3. Check for any final change in air bubble upwellings.
 4. If no improvements, reopen air vents and air valves.
 - c. Conduct water level measurements and log east entrance weir measurements at least 3 times during test.
 - d. Allow east entrance weir to auto-adjust, if there is sufficient confidence in PLC system
 - e. Run for at least 1 hour to obtain comprehensive daytime view of operations
4. Prepare for Fish Unit Operation
 - a. Put West and South Entrance weirs in position
 - i. 2 weirs at west entrance with 8.5 feet submergence
 - ii. 2 weirs at south entrance at 8.5 feet of submergence
 - b. Readjust East entrance weirs: 2 weirs at 9.5 feet, 1 weir at 2 feet submergence

- c. Settings based on median November tailwater conditions, subject to change pending conditions on day of testing
5. Activate one Fish Unit Operation with AWS operating
 - a. Turn on one Fish Unit
 - i. start at 50% flow, wait 10-15min,
 - ii. then 75% flow, wait another 10-15min
 - iii. then put to full flow.
 - b. Conduct water level measurements and log all entrance weir measurements at least 3 times during test.
 - c. Monitor the fish units
 - i. Throughout startup, steady state and shutdown.
 - ii. Watch for stability of operation, possible pressure surges in the draft tube, any instability at the governor. These may exhibit even without apparent hydraulic issues in the fishway.
 - d. Allow all entrance weirs to auto-adjust, if there is sufficient confidence in PLC system
 - e. Check for potential seiching or wave activity in the ladder or other operational concerns
 - f. Check general ladder performance
 - i. Entrance submergence (> 8 feet at 2 weirs at all three entrance locations)
 - ii. Entrance head (1 – 2 feet, 1.5 optimum) at all three entrance locations
 - iii. Channel velocities in Powerhouse Channel and South transport channel
 - iv. Junction pool observations
 - g. Run for at least 2 hours to allow for system oscillations and flow adjustments.
 - i. Obtain more visible and comprehensive daytime view of operations
 - ii. Allow entrances to auto-adjust if there is more confidence in the existing PLC.
6. Preliminary AWS backup Shutdown and Restart with One Fish Unit operating
 - a. Open 2 x20" air vents and Air Vacuum Valves in 7-foot Valve room (if needed)
 - b. Close 7-foot Valves simultaneously
 - c. Allow for 20 minute pause with just one fish unit running
 - i. Note drop in entrance heads (and weir auto adjustments if system in auto)
 - d. Reopen 7-foot Valves simultaneously
 - e. Run for 20 minutes with one fish unit running simultaneously
 - i. Note any difference from the previous simultaneous AWS and FU operation
 - ii. Note increases in entrance heads (and weir auto adjustments if system in auto)
7. Shutdown AWS backup System
 - a. Close 7-foot Valves simultaneously
 - b. Return AWS backup system to Stored Position per Sections 4.1.3 and 4.1.4 of the O&M Manual.
 - c. Close pressure taps
8. Resume full operation of the Fish Ladder
 - a. Restore Fish ladder weir settings to those prior to testing.
 - b. Activate 2nd Fish Unit (one already operating)

c. Assume resumption of PLC operation of the entrance weirs