U.S. Army Corps of

Engineers

Portland District

Operations Division

The Dalles Lock and Dam

**Turbine Dewatering and Fish Salvage**

2020

**FOREWORD**

This Standard Operating Procedure (SOP) is intended to prescribe a maintenance practice and procedure for turbine dewatering fish salvage. This document will be reviewed periodically or if conditions change. Questions regarding this document or other documents should be directed to: Fisheries 541 506 8275

DEPARTMENT OF THE ARMY

Corp of Engineers, Portland District

Operations Division

The Dalles Lock and Dam

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1. **Purpose.** This U.S. Army Corp of Engineers (Corps), Northwestern Division, Portland District, The Dalles Lock and Dam (District) Standard Operating Procedure (SOP), prescribes a maintenance practice and procedure for the Fish Removal and Dewatering of a Turbine Unit. Some procedural sections of this SOP are to reduce the amount of fish that become entrapped, thus reducing the potential for fish mortalities. It also helps reduce the amount of labor required to remove fish from a turbine scroll case and draft tube. Usually if the correct turbine unit dewatering procedures are followed, few fish are found in the draft tube and/or scroll case.
2. **Applicability.** This SOP is applicable to all The Dalles Lock and Dam operation project employees. This SOP is not applicable to contract employees.
3. **References –** Annual Fish Passage Plan
4. **Related Procedures.**
5. **Definitions.** Definitions are for major items discussed within the document. Definitions also explain acronyms if not already stated in the text (spell out the first time with acronym in parentheses).
6. **Responsibilities –** The Dalles Fisheries Section
7. **Coordination.**
   1. The time and scheduling of the turbine dewatering is in accordance with operation and maintenance unit outage schedule.
   2. Fisheries requires a 1 week notice to assure adequate staffing.
   3. Fish removal must occur within four days of installing headgates and taillogs (per Fish Passage Plan requirement).
   4. Gatewells do not need to be dipped for juvenile fish prior to dewatering due to lack of turbine screens.

# Adequate water supply (fish save mode) will be provided until fisheries personnel are on site.

# Fisheries must notify the Control Room that they are onsite prior to opening drain valve.

# Wickets gates must remain closed between turbine shut down and the tail log installation. A 5 minute wicket opening for functional testing is allowed. (per Fish Passage Plan requirement)

# Preparation

# Fisheries provides;

# Handling and release procedures

# Rescue personnel

# All required fish salvage equipment

* 1. Maintenance provides;
     1. Activity Hazard Analysis
     2. Pre-work safety briefing
     3. HECP clearances
     4. Confined space entry permits
     5. Water level monitoring
     6. Work leader, hoist operator, crane operator and attendant
     7. Hoist
     8. Scroll case and draft tube lighting
  2. Operations provides;
     1. HECP clearance
     2. Valve operation

1. **Procedures**
   1. Operate turbine under full load if possible, to flush fish from draft tube. If full load not possible, then speed-no-load > 15minutes.
   2. Immediately after the turbine shut down, the maintenance installs the two bottom stoplogs in each bay. Then stacking remainder of stoplogs in any order.
   3. Gatewell orifice is blocked temporary plate to prevent flow from Ice and Trash Sluiceway. Some units have the orifice permanently plated.
   4. Maintenance requests necessary HECP clearances.
   5. Fisheries will be on standby while dewatering drains are open.
   6. Maintenance will monitor water level and inform fisheries when low enough to enter.
   7. Maintenance will do confined space entry documentation.
   8. When water level is around 2’, the Structural Crew will lower two Fisheries personnel in scroll case using hoist and cage.
   9. When water level is around 2’, the Structural Crew will lower one Fisheries person in draft tube using the hoist and cage to assess fish numbers.
   10. If fish numbers are high, a second Fisheries person will be lowered into the draft tube. If fish numbers are low, one fisheries personnel can salvage the fish, but they must remain hooked to the safety line.
   11. Fisheries personnel capture fish by using dip-net and bag. Six to twelve fish per bag depending on size.
   12. Remove bag by rope or hoist and transport through gallery by handcart to fish tank staged in the oil room.
   13. Salvage tank will be on standby to be lowered through nearest hatch into gallery if more than 20 fish. Water supply will be provided. Crane operator will be on standby if needed.

# No more than 20 fish per tank load depending on fish size.

# A second transport tank will be used going up elevator onto tailrace deck for release to prevent water leakage in elevator.

# Fisheries Crew releases fish to tailwater or transport to nearest tailrace location by bag and rope. Second rope tag line will be needed to tip bag at water line.

# If sturgeon greater than 5’ and will not fit into lift bag, a safety pool must be maintained and monitored to assure sturgeon survival until turbine is returned to service. Extensive outages may require periodic feeding of shad.

# To reduce fish numbers commonly found in units 19-22, a flow reduction of surrounding units may be necessary. In addition, to reduce the chance of debris washing onto the tail log sill during tail log installation in units 19 through 22, fish unit loading may be reduced to about 8 MW for 30-60 minutes. Entrance weir E1 may be closed for the same duration.

# Procedure Exception For Fish Units

* 1. Fish units are screened for adult fish access by diffuser grating and reduced intake trashrack gaps. If grating is found intact, inspect can be done with ROV to assure no fish are present.

1. **Station Service Units**
   1. New access equipment is being developed for entry into these units
2. **Safety Concerns.** (See Activity Hazards Analysis for further detail)
   1. Slippery conditions are common on the floor of the fishway, therefore felt soled waders are highly recommended.
   2. Extreme caution should be taken in order to prevent back injury when lifting bags filled with fish, handcarts should be used when possible.
   3. Fall prevention; be sure that all necessary precautions and procedures are followed to assure personnel’s safety.
   4. Air quality is an important hazard to be aware of, be sure to have all then needed safety equipment.
   5. Due to extremely limited visibility, be sure to have flashlights, backup flashlights, and extra batteries.
   6. To ensure hand protection, be sure to wear appropriate gloves, and be aware of pinch points on cables.
3. **Equipment Check List**

* Intake Crane – headgate install
* Tailrace Crane – tail log install
* Mobile Crane – orifice block install if needed
* Scroll case hoist and basket – access to scroll case
* Hoist – access draft tube
* Fish Tank- transport fish to release site. Water supply required.
* Dip-nets- capture fish
* Fish bags- transfer fish to fish tank and to tailwater release. 2 sizes needed.
* Rope release – 2 staged on tailrace deck at nearest loction
* Safety harness- to access draft tube via hoist
* Hardhat- Nogen protection
* Hip waders- water depth to 2’
* Safety glasses- optional
* Gloves- hand protection. Sturgeon scoots and catfish barbs
* Flashlights- its dark down there
* Headlamps- hands free, increased vision
* Radios with headphones- communication clarity. High noise environment
* Personal Flotation Device- drowning protection