

## Fish Passage Plan (FPP) Change Request Form

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**Change Form # & Title:** 15IHR005 – Backflush Orifices  
**Date Submitted:** October 30, 2014  
**Project:** Ice Harbor Dam  
**Requester Name, Agency:** Ken Fone, Ice Harbor Dam  
**Final Action:** DENIED – [January 22, 2015](#)

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**FPP Section:** Table IHR-1 (Gantt chart); 2.3.1.2.c Juvenile Passage Facilities – Fish Passage Period – Collection Channel; 3.1.2.3 Juvenile Passage Facilities – Unscheduled Maintenance – Gatewell Orifices.

**Justification for Change:** Woody debris in the gatewells is typically low at Ice Harbor Dam, even during the spring runoff period. Backflushing orifices up to three times a day, when the orifices are not obstructed, speeds up the wear and tear of orifice gates, seals, and pneumatic components. A person can stand directly above the orifice jets and easily see changes to the normal flow pattern, indicating possible debris obstructions.

### **Proposed Change:**

#### **2.3.1.2.c. Collection Channel.**

c.6. ~~Backflush~~Inspect orifices jets at least once per day for diminished flow or irregular spray patterns indicating a possible partial debris obstruction at an orifice. Immediately backflush the orifice if there is any indication of an obstruction. During periods of higher fish and debris passage, April 1 through July 31, orifices should be inspected ~~and backflushed~~ once per 8-hour shift or more frequently as determined by the project biologist, and backflushed as necessary, to keep orifices clean.

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#### **3.1.2. Unscheduled Maintenance.**

**3.1.2.3. Gatewell Orifices.** Each gatewell has two 12" orifices with air operated valves to allow fish to exit the gatewell. Under normal operation, one orifice per gatewell is operated. To minimize blockage from debris, orifices jets are ~~eyeled and back flushed~~inspected and orifices backflushed as needed at least once per day, and more frequently if required by heavy debris loads. If an air valve fails or is blocked with debris, the valve should be closed and the alternate orifice for that gatewell operated until repairs can be made. If both orifices are blocked with debris, damaged, or must be kept closed, the turbine unit will be taken out of service until repairs can be made. If repairs are to take longer than 48 hours, juvenile fish will be dipped from the gatewell with a gatewell dip basket in accordance with the project dewatering and fish-handling plan.

**Table IHR-1. Ice Harbor Dam Schedule of Operations and Actions Defined in the 2015 Fish Passage Plan.**

Task Name	Start Date	End Date	FPP Reference	2014											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2014 FPP Operations &amp; Actions - Ice Harbor</b>	3/1/14	2/28/15	IHR	[Gantt bar spanning from March 2014 to February 2015]											
<b>Fish Passage Facilities Operation</b>	3/1/14	12/31/14	2.3.	[Gantt bar spanning from March 2014 to December 2014]											
Adult Fish Facilities	3/1/14	12/31/14	2.3.2.2	[Gantt bar spanning from March 2014 to December 2014]											
Juvenile Fish Facilities	4/1/14	12/15/14	2.3.1	[Gantt bar spanning from April 2014 to December 2014]											
<b>Fish Passage Facilities Maintenance</b>	12/16/14	3/31/15	2.3	[Gantt bar spanning from December 2014 to March 2015]											
Juvenile Fish Facilities Winter Maintenance	12/16/14	3/31/15	2.3.1.1	[Gantt bar spanning from December 2014 to March 2015]											
Adult Fish Facilities Winter Maintenance	1/1/15	2/28/15	2.3.2.1	[Gantt bar spanning from January 2015 to February 2015]											
<b>Turbine Operations for Fish Passage</b>	3/1/14	12/31/14	4.1., 2.3.1.	[Gantt bar spanning from March 2014 to December 2014]											
Turbine operating priority order	3/1/14	11/30/14	Table IHR-4	[Gantt bar spanning from March 2014 to November 2014]											
1% operating range - hard constraint	4/1/14	10/31/14	4.1.3.	[Gantt bar spanning from April 2014 to October 2014]											
Backflush orifices ≥ once per 8-hrs	4/1/14	7/31/14	2.3.1.2.c.6.	[Gantt bar spanning from April 2014 to July 2014]											
Priority turbine unit maintenance	11/1/14	12/31/14	4.3.	[Gantt bar spanning from November 2014 to December 2014]											
STS removal if cold-weather criteria apply	11/20/14	12/15/14	2.3.1.2.b.9	[Gantt bar spanning from November 2014 to December 2014]											
<b>Spill Operations for Fish Passage</b>	4/3/14	8/31/14	2.3.1.2., App E	[Gantt bar spanning from April 2014 to August 2014]											
Spillway Weir in service (end date approx)	4/3/14	8/31/14	2.3.1.2.g.	[Gantt bar spanning from April 2014 to August 2014]											
Spring Spill Operations (end date approx)	4/3/14	6/12/14	FOP	[Gantt bar spanning from April 2014 to June 2014]											
Summer Spill Operations (dates approx)	6/13/14	8/31/14	FOP	[Gantt bar spanning from June 2014 to August 2014]											
<b>Special Operations &amp; Studies (dates approximate)</b>	3/1/14	3/31/15	App A	[Gantt bar spanning from March 2014 to March 2015]											
Adult Salmon Studies	3/1/14	2/28/15	6.2.2.	[Gantt bar spanning from March 2014 to February 2015]											
Sensor Fish Turbine Characterization Study	3/1/14	8/31/14	6.2.1.	[Gantt bar spanning from March 2014 to August 2014]											
Units 4-6 MU Digital Governor Replacement	3/1/14	3/31/14	6.1.3.	[Gantt bar spanning from March 2014 to March 2014]											
Units 4-6 Steady State Model Validation Test	3/24/14	3/31/14	6.1.3.	[Gantt bar spanning from March 2014 to March 2014]											
Adult Lamprey Passage Studies	5/1/14	10/31/14	6.2.3.-5.	[Gantt bar spanning from May 2014 to October 2014]											
Transformer Oil Replacement	7/21/14	10/1/14	6.1.5.	[Gantt bar spanning from July 2014 to October 2014]											
Units 1-3 MU Digital Governor Replacement	10/1/14	2/28/15	6.1.3.	[Gantt bar spanning from October 2014 to February 2015]											
Units 1-3 Steady State Model Validation Test	3/1/15	3/31/15	6.1.3.	[Gantt bar spanning from March 2015 to March 2015]											
<b>TDG Monitoring</b>	3/1/14	2/28/15	2.2.	[Gantt bar spanning from March 2014 to February 2015]											
TDG Monitoring - Tailrace (year-round)	3/1/14	2/28/15	station IDSW	[Gantt bar spanning from March 2014 to February 2015]											
TDG Monitoring - Forebay	4/1/14	8/31/14	station IHRA	[Gantt bar spanning from April 2014 to August 2014]											
<b>Adult Fish Counting</b>	4/1/14	10/31/14	Table IHR-2	[Gantt bar spanning from April 2014 to October 2014]											
Daytime Visual 0400-2000 PST	4/1/14	10/31/14		[Gantt bar spanning from April 2014 to October 2014]											
<b>Reports</b>	3/1/14	3/15/15	2.3.3.	[Gantt bar spanning from March 2014 to March 2015]											
Weekly Reports	3/1/14	12/31/14		[Gantt bar spanning from March 2014 to December 2014]											
Annual Report	2/10/15	3/15/15		[Gantt bar spanning from February 2015 to March 2015]											

Inspect

## **Comments:**

1/16/15 NOAA memo: “Multiple FCRPS studies and in-season monitoring results have indicated that salmonids migrating through bypass systems can experience excessive injury and mortality rates if debris loads are allowed to accumulate in the bypass system. Orifices are a key component in bypass systems affecting the condition and survival of salmonids, and maintaining clean orifices is essential to salmon condition and survival. While a disturbed jet likely indicates an orifice has a debris blockage, it is not always the case that a clean jet indicates an orifice is clean. For example, a single small diameter (<1”) stick perpendicular to the face of a 12 inch orifice may not significantly disturb the jet, but could impact fish condition. Given this, we are not confident that the visual inspection method is sufficient in maintaining clean orifices throughout the passage season. Cycling orifices frequently is currently our only defense against debris build up and the probable impacts to fish condition. We recommend the project and Walla Walla FFDRWG begin working towards alternative solutions (e.g., auto cycle) that make it less difficult and time consuming for project staff to manually cycle orifices at IHR. In the absence of an automated system, a minimum of two manual orifice back-flushes per day from April 1 through July 31, and one backflush per day thereafter should insure the orifices are relatively clear for fish passage.”

1/22/15 FPOM: Fone gave some background. The current required back-flushing seemed to be excessive. Setter explained that NWW is resistant to change. Conder suggested an automated system to help with flushing. Bailey said he has similar concerns about an automated system as Fredricks has with PLC inspections; you don’t know what is going on out there without being there. Fredricks said automated systems are pretty standard in the lower Columbia. He pointed out that BON was almost the flagship with how the juvenile bypass system operates. BON orifices flush automatically several times a day. Fone said there is some automation in the channel since the orifices will close if elevations get too high. There is air available so it’s just a matter of getting a program installed that will automatically flush the orifices. Setter suggested getting an automated system into AMRIP and getting it on the scoping list. She recommended using BON as an example since it has a functional back-flushing system.

**Record of Final Action:** 1/22/15 FPOM - DENIED