

Ice Harbor Dam¹

1. Special Project Operations.

- 1.1 Spill.** Spill for fish passage will be provided during the outmigration season in accordance with spill specifications in Appendix E and as coordinated through TMT. Alternative spill patterns to control dissolved gas levels or change fish passage conditions will be coordinated through the FPOM.
- 1.2 Doble Tests.** Two transformers, TW3 and TW4 and turbine units 3 and 4 will be taken out of service for Doble testing in 2011. The outage is tentatively scheduled for 11-22 July 2011. Since Ice Harbor Dam has multiple transformer banks and transmission lines, and redundant switching capability, the remaining turbine units will be available for operation during these tests. Turbine unit 1% efficiency operations and turbine priorities will continue to follow fish passage plan requirements during these tests.
- 1.3 Navigation.** Short term adjustments in spill patterns, spill discharge rates and/or turbine operations may be required for navigational safety. This includes both commercial tows and fish barges. Scheduled navigation lock outage for 2011 is January 17 – March 13.
- 1.4 Steady State Model Validation Testing.** Western Electricity Coordinating Council requires steady state model validation testing on a periodic basis to ensure the generating equipment will meet real and reactive power ratings. All units will be tested on a 1-2 year cycle. Test will involve running the unit out of fish priority sequence and outside the 1% criteria. Testing can take place at any time except from 1 April to 31 August due to fish considerations. Tests will preferably be conducted just after unit annual maintenance, but may happen at other times. Tests will last for a standard of 30 minutes at maximum load with additional time to run the unit along the maximum real/reactive power curve to the minimum settings. Total test time is anticipated to be 90 minutes or less. Test durations will be minimized to the extent possible and will only be run for the purpose of completing the required model validation testing.
- 1.5 Trilateration Surveys.** Dam safety has scheduled the performance of trilateration surveys at Ice Harbor Lock and Dam, in the February/March/April 2011 time frame. This requires the contracted surveyors to have a direct line of sight across the top of the embankment and roadway deck of the powerhouse, spillway, non-overflow sections, and Navigation lock and that the brass cap survey markers do not have anything set over the top of them.

¹ The purpose of this section is to notify regional interests of planned activities that will or may affect fish passage. Further coordination may occur as needed.

- 1.6 Governor Training.** During the scheduled annual maintenance of main turbine unit 5 which begins July 11, 2011 and ends August 4, 2011; governor training for Project Mechanics will be performed. This training will take place during the first part of the scheduled unit outage. It is expected that the governor as-found condition check-out will take approximately 6 hours to complete. The governor will be run through a series of situations and settings. This evolution may utilize water that would normally be used for spill. The training element will include governor troubleshooting, teardown during the maintenance period, and inspection and repair during re-assembly.
- 1.7 Transformer TW-6 Replacement.** The replacement of Transformer TW-6 is anticipated during 2011. The work windows start and end work dates are tentatively established as 1 OCT 2011 and 30 NOV 2011, respectively.
- 1.8 Periodic Inspection.** The Navigation Lock is scheduled to be inspected during the Lock Outage in February 2011. This is part of the 5 year formal Periodic Inspection process.
- 1.9 Turbine Direct Capture Tailrace Velocity Measurements.** Flow measurement of the tailrace conditions at Ice Harbor Dam will be conducted at varying flow conditions over a period of two days. The estimated period of performance will be late February to the first week in March 2011 when the south fish ladder returns to service. A boat-mounted 600KHz Workhorse Acoustic Doppler Current Profiler (ADCP) will be used to determine flows while the south fish ladder is in operation during four different turbine operating conditions. It is estimated the testing will during two consecutive days. Operating conditions will involve single to multiple turbine unit operation at upper and lower 1% operating efficiencies. To adjust outflow conditions to the desired turbine operating conditions, Ice Harbor and possibly the other lower Snake projects will need to pool water and deviate from the minimum operating pool (MOP).
- 1.10 Fiber Optic Communication Upgrade.** Bonneville Power Administration will be upgrading the communication system between the Ice Harbor Powerhouse and the Sacajawea substation. This upgrade will require replacement of the lightning ground wire atop the line two transmission towers between the two stations. Performance of this work will require lines one and two to be de-energized and grounded for approximately four days. This will impact turbine units one and two during this time and will require routing power from units 3 and 4 out line three. The impacts of this outage can be minimized by scheduling it with the unit 1 annual maintenance and unwatering; currently scheduled for 1-25 August 2011. The line up to route power out line 3 will already be in place during this time and the only additional impact will be unit 2.

2 Studies

2.1 Evaluation of Adult Pacific Lamprey Passage Success at McNary and Lower Snake River Dams. This study will evaluate passage success for adult Pacific lamprey *Lampetra tridentata* at McNary Dam, Ice Harbor Dam, and the remaining lower Snake River dams and associated river segments using a combination of acoustic telemetry and half duplex passive integrated transponder (HD PIT) systems. Adult lamprey will be trapped in adult fishways at McNary dams, held and then tagged at the juvenile smolt sampling facility prior to release. This study will require McNary, Ice Harbor and potentially other Snake River dams to provide power for electronics equipment in the fishways and tailrace areas (above fishway entrances, powerhouse draft tubes, and adjacent to spillbays, access for the installation, repair, and testing of electronic and trapping equipment and access for the downloading of data from acoustic and PIT tag detection equipment. Some project crane support may be needed to install antennas in and near fishways. Maintenance and installation of equipment will occur during the winter maintenance period when adult fishways are dewatered. Work is continuing in 2011.

2.2 Underwater Video Monitoring of Adult Fish Ladder Modifications to Improve Pacific Lamprey Passage at McNary and Ice Harbor Dams, 2011. The purpose of this study is to use underwater video, DIDSON, and/or other non-invasive technologies to count and observe adult salmonids and Pacific lampreys, *Entosphenus tridentatus*, in the fish ladders at McNary and Ice Harbor Dams on the Columbia and Snake rivers. The primary goal of this work is to estimate the numbers of adult lamprey passing behind the picketed lead gates at count stations and to develop escapement estimates of the total number of lamprey passing McNary and Ice Harbor Dams. A second goal is to evaluate the behavior of adult lamprey at the new lamprey orifices installed at the south shore fishway vertical slot section using underwater video equipment. This study will require McNary to provide power for electronics equipment in the fishways, access for the installation, repair, and testing of electronic equipment and access for the downloading of data from video camera equipment. Some project support may be needed to install video cameras in and near fishways. Maintenance and installation of equipment will occur during the winter maintenance period when adult fishways are dewatered. Work is new in 2011.

2.3 Evaluation of Fish Counting Accuracy Issues at FCRPS Dams, at Ice Harbor and Lower Monumental Dams. Determine if counting slot lighting modifications, video camera location and upgrades, and video monitor placement can improve fish counting accuracy at Ice Harbor and Lower Monumental dams. During daytime, the IHR north counting slot is exposed to direct sunlight, particularly in June and July, when the sun is highest and when the majority of count discrepancies are seen, and this creates difficult viewing conditions for fish counters. By conducting random visual sampling counts of the video recorded

count stations (and sample video recordings periods) and comparing to the visual counter at the other count station, we can determine if there are count accuracy and/or identification issues. Fish counts at IHR are often lower than those at upstream dams, possibly suggesting some issue with fish counting accuracy at IHR. This is particularly frequent in June and July, when the sun is highest and glare may be at its worst at these count windows. At IHR and at LMN, all fish counting is done by video in the IHR north and the LMN south fishladder counting slots. Evaluate effects of modified Ice Harbor and Lower Monumental counting slot lighting and video monitoring equipment on counting accuracy.