

OFFICIAL COORDINATION REQUEST FOR NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE - 17 LMN 10 - Lower Monumental Unit 3 Blade Position

COORDINATION DATE - 13 September 2017

PROJECT- Lower Monumental Dam

RESPONSE DATE- 27 September 2017

Description of the problem - Currently Lower Monumental has only one turbine available, Unit 6, due to the remaining turbine units out of service for a variety of repairs and upgrades. At river flows exceeding 18,909 cfs and 100 feet of head, involuntary spill is required due to the number of available turbines. Unit 6 is the next to last unit in priority and the operation of Unit 6 with spill may result in poor passage conditions at the north entrance. Unit 3 was removed from service on August 22, 2017 due to suspected blade packing leakage. The actual source of oil remains undetermined but it is believed to originate from the trailing edge of the turbine blades as a result of failed blade packing on unit 3. The Project has removed the oil from the static oil head, drained the hub and will be hydraulically blocking the governor blade servo to speed the units' return to service. This temporary repair is expected to remain in place at least 12 months or potentially longer depending on unit 1 returning to service and completion of repairs to other units at Lower Monumental. This type of failure requires placing unit 3 blades in a fixed position prior to operation. The temporary repair of unit 3 for the remainder of the 2017 fish passage season will include hydraulically locking the unit at an estimated 28.5 degree angle of pitch as recommended by the Hydroelectric Design Center based upon experience gained from operation of Unit 2 at Lower Granite. This work is expected to take less than 1 week to complete. The Project would like confirmation of 28.5 degrees as the angle to position the blades as was coordinated for unit 2 at Lower Granite (17LWG 001). This would provide a buffer to assure that actual unit operation stayed within the 1% criteria, required during fish passage season.

Type of outage required - Unit 3 is presently out of service and will remain in this condition until the governor blade servos are hydraulically locked.

Impact on facility operation (Fish Passage Plan deviations) – With Unit 2 already forced out of service due to suspected blade packing leaks, Unit 3 became the Fish Attraction Unit. To assist in improving fish attraction to the North Fish Ladder entrance, it is planned to operate Unit 3 as first on and last off through the end of the Adult Fish Passage period. This operation may have to be modified depending on the outcome of operational testing of the unit.

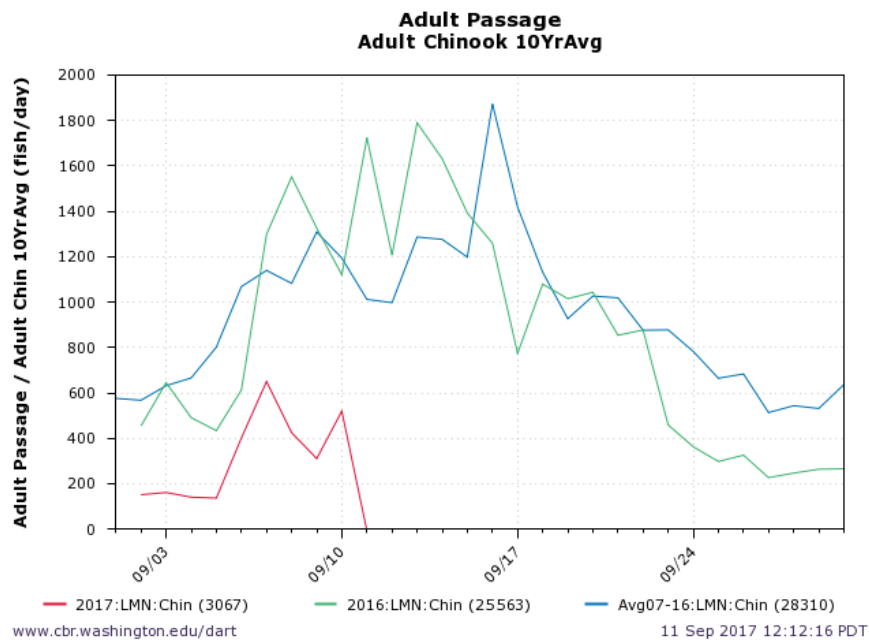
Impact on unit priority - Unit priority may be impacted. Through the remainder of the Adult Fish Passage period, unit priority will be unit 3, 4, and 6 in that order. Unit 1 is expected to return to service in July of 2018. Depending upon the success of this operation on Unit 3, Unit 2 may be modified and returned to service in the same manner until the necessary resources become available to repair the leaking blade packing.

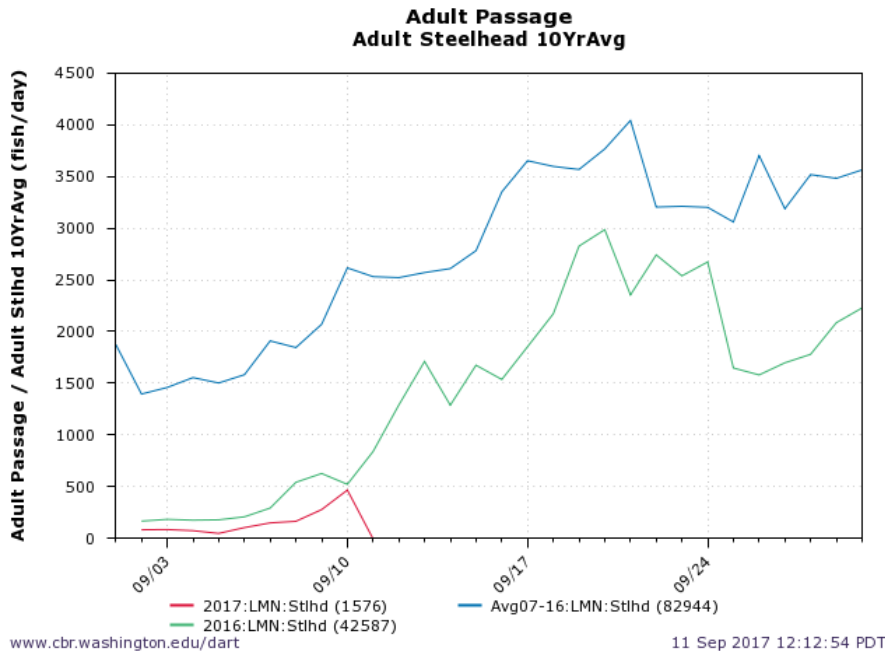
Impact on forebay/tailwater operation – No changes in tailwater conditions are expected with this change since Unit 3 is already operating for fish attraction.

Impact on spill - NA

Length of time for repairs - Temporary repair of unit 3 is expected to take 1 week.

Analysis of potential impacts to fish





1. The 10 year average adult passage for the month of September is 28,310 chinook and 82,944 steelhead. Juvenile outmigration has greatly decreased and numbers are expected to remain very low throughout this period.
2. Recent steelhead and fall Chinook numbers have been much lower than the 10 year average and overall, 2017 runs are forecasted to be significantly less than average. However, a large portion of the fall Chinook and steelhead run will still occur during this period.
3. The return of unit 3 will potentially reduce passage delay and benefit a large portion of the adult fall Chinook and steelhead runs.
4. Current unfavorable conditions due to unit outages at Lower Monumental may affect the upstream passage of adult chinook and steelhead by increasing delay time in locating passage routes. Currently, the dam is operating with unit 6 and spill which may be causing some delay in adult passage. By bringing back unit 3, a higher priority adult passage unit, this delay may be reduced allowing for more effective adult passage at Lower Monumental during September. Unit 3 blades are being locked at a 28.5 degree angle which will keep generation within the 1% peak efficiency stated in the FPP.

Summary statement - expected impacts on:

Downstream migrants: Minimal impact based on current information available.

Upstream migrants (including Bull Trout): N/A

Lamprey: N/A

Comments from agencies

-----Original Message-----

From: Erick VanDyke [mailto:erick.s.vandyke@state.or.us]
Sent: Tuesday, September 12, 2017 3:41 PM
To: Hockersmith, Eric E CIV USARMY CENWW (US)
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Subject: [EXTERNAL] RE: 17 LMN 10 MOC Unit 3 Blades Position

I will be supportive of fixed angle that meets 10.8 kcfs minimum 1% generation ops described in the 2017 FOP. Given past results and operational constraints that build in a volume increase above FOP documents stated performance, fixing the blade any higher will simply erode powerhouse passage. If a summary of what blade angles correspond with turbine flow kcfs that will be helpful. Thanks.

Erick S. Van Dyke
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Fish Passage/Mitigation Technical Analyst
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971-673-6068 Office

-----Original Message-----

From: Trevor Conder - NOAA Federal [mailto:trevor.conder@noaa.gov]
Sent: Wednesday, September 13, 2017 10:01 AM
To: Hockersmith, Eric E CIV USARMY CENWW (US) <Eric.E.Hockersmith@usace.army.mil>
Cc: Ritchie Graves <Ritchie.graves@noaa.gov>
Subject: [EXTERNAL] Re: 17 LMN 10 MOC Unit 3 Blades Position

Eric,

As we discussed on the phone, NOAA supports the proposed angle as long as it fall within the 1% efficiency range. Another factor to consider

would be how the different screens at LWG and LMN would affect the efficiency prediction. After two missed attempts by HDC to hit the 1% target at LWG, we suggest an angle at LMN that is highly likely to fall within 1% so we don't have to do this a second time. Please inform us as soon as the testing confirms if we are within the 1% range or not.

-Trevor

Final coordination results

After Action update

LMN Unit 3 Fixed Blade Angle (Hockersmith, Setter) – The project fixed the blades at 28.5° which is below the upper threshold of 1 %. The unit came back to service on 12 September. Unit 4 returned to service on 13 September. Units 3, 4 and 6 are now back in service. Unit 3 commissioning testing will be the second week of October. The project will conduct index testing to verify that it is within the 1% band. The blade angle can be adjusted after the testing if necessary. Hockersmith will update FPOM with the testing results.

Please email or call with questions or concerns.

Thank you,

Chuck Barnes
Supervisory Fisheries Biologist
Lower Monumental Dam
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