

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

COORDINATION TITLE- 18BON04 - Unit 15 modified operation

COORDINATION DATE- 3 May 2018

PROJECT- Bonneville Dam

RESPONSE DATE- ASAP with a deadline of 17 May.

Description of the problem:

PH2 Main Unit 15 (MU15) operations change in the 1% peak efficiency range and change to PH2 unit priority.

Background

On Tuesday, April 17, USACE district and project personnel inspected the gatewell flow control plates in both MU15 A & B gatewells.

1. Results of the inspection included the plates in both A & B gatewells clearly show that the anchors are pulling out due to undetermined amount of underwater sustained vibrations. Engineering agreed that this problem will only exacerbate, at an undetermined rate, with the eventual catastrophic failure of the anchors.
2. Everyone agreed that something needed to be done to secure the plates or remove them before watering up the unit. Temporary methods to secure the plates were evaluated in the days that followed.
3. By April 30, it was determined that the time to complete the temporary structure to secure the plates will take a minimum of 4-5 weeks, costing at least 100k, forcing the unit out of service that entire time. This would tie up the project staff pulling them away from routine maintenance. Project powerhouse capacity is limited with MU15 out of service impacting generation and increasing the potential to exceed the spill threshold for pulling rocks into the stilling basin when spilling >150kcfs. The B2 FGE post construction evaluation would miss nearly the entire spring data collection period for gap loss in Unit 15.
4. The team decided the current path forward is to remove the plates and cut off the existing anchors flush to the concrete, epoxy the existing open holes, and water up MU15 to return to service. The current outage has been extended to COB Wednesday, May 9.
5. Engineers agree that the plates installed in every unit will eventually fail over time if left unattended. How much time before failure is impossible to know and efforts are underway to develop a plan and schedule for addressing the other units.

6. Post construction evaluation – PNNL STS gap loss equipment is being removed from MU15 A & C STS. Equipment will be installed on MU14 A & C STS's on Monday, May 14, during the regularly scheduled PH2 STS inspections. This will allow gap loss data to be collected on a middle unit with similar hydraulics to MU15 for the rest of the spring migration until approximately the end of the first week of June. Gap loss data in MU14 will continue to be collected during the summer period of testing. Unit 17 also has gap loss data being collected for spring and summer.

Type of outage required

Impact on facility operation (FPP deviations)

Operate MU15 to the mid 1% peak efficiency (15kcfs) as the upper limit of the unit operation range to protect fish in the gatewell when spilling less than 150 kcfs. When spilling over 150 kcfs, MU 15 will operate within the full 1% peak efficiency range, i.e., 2018 Fish Passage Plan operation. The intent of this operation is to minimize risk for –

1. fish from excessive turbulence in the gatewells
2. hitting the 150 kcfs spill threshold for moving rocks into the stilling basin
3. operation time above the 150 kcfs spill threshold

Impact on unit priority – Unit 15 has no plates, which have been shown to be successful in providing fish protections. Due to that, it is recommend that MU 15 be last on/first off for PH2 units. The unit priority would be as follows:

2018 FPP unit priority - 11, 18, 12, 17, 13, 14, 15, 16

Modified unit priority - 11, 18, 12, 17, 13, 14, 16, 15

Impact on forebay/tailwater operation

None

Impact on spill

No court ordered spill impacts.

Dates of impacts/repairs

Unit 15 restricted operation to start when unit returns to service week of May 7, 2018 and continue to July 31, 2018 as well as April 1 through July 31 in any following years. MU15 may be operated within the full 1% range August 1 through October 31. This timing is similar to the mid-range operation coordinated in the 2014 through 2016 FPPs (section 5.2.4.1).

Length of time for repairs

Until MU15 has gatewell flow control plates installed.

Analysis of potential impacts to fish

Changing unit operation, priority, and allowing full 1% operation when spilling above 150kcfs and after July 31 will minimize exposure to bypassed fish during the most sensitive periods and protect the spillway from damage due to ball milling of rock. This is based on physical model observations indicating an increased incidence of rock deposition into the spillway stilling basin at spill \geq 150 kcfs, which has caused erosion to the structure in the past.

Smolts that pass BON during summer and fall tend to be larger in size than earlier migrants and therefore less susceptible to descaling or mortality as a result of gatewell turbulence. Testing by Gilbreath et al. has shown that operating in the lower half of the 1% range is preferred during passage of smaller fish until the PH2 gatewell issue can be corrected.

Summary statement - expected impacts on:

Downstream migrants

Modified operations for MU15 will protect gatewell passed fish. Turbine geometry is not optimized for any turbine passed fish with mid 1% peak efficiency (15 kcfs) upper limit operation. *(Please see NOAA's recommendation (ERDC Trip Report memo, January 20, 2011) for more information on turbine passage conditions.)*

Upstream migrants (including Bull Trout)

No impact to upstream migration. Efforts to protect juvenile salmonids in the gatewells will also protect upstream migrant adult fallback including bull trout.

Lamprey

No impact to upstream migration. Efforts to protect juvenile salmonids in the gatewell will also protect lamprey in the gatewell.

Comments from agencies

WDFW - -----Original Message-----

From: Morrill, Charles (DFW) [mailto:Charles.Morrill@dfw.wa.gov]

Sent: Thursday, May 03, 2018 11:23 AM

Subject: [Non-DoD Source] RE: FPOM: MOC 18BON04 Unit 15 modified operation

Hi Tammy,

;-) ... news like this always makes the day more thrilling sigh
...suffice it to say, this is a significant issue and we agree with
NOAA's support for the MOC

thank you

Charlie

NOAA

From: Trevor Conder - NOAA Federal [trevor.conder@noaa.gov]
Sent: Thursday, May 3, 2018 10:27 AM
Subject: Re: FPOM: MOC 18BON04 Unit 15 modified operation

Tammy,

NOAA supports this MOC as described. It is unfortunate, but hopefully
we can figure out a permanent fix soon. Thanks for the coordination.

-Trevor

CRITFC

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

From: Tom Lorz [mailto:lort@critfc.org]
Sent: Thursday, May 03, 2018 12:44 PM
To: Mackey, Tammy M CIV USARMY CENWP (US)
<Tammy.M.Mackey@usace.army.mil>
Subject: [Non-DoD Source] RE: FPOM: MOC 18BON04 Unit 15 modified
operation

Not happy about loosing at least another week of the spring run which
is ramping up for this study. But see no other option. Need to have
this on the next FFDRWG to look what the steps forward are for this
project and for out years ops, bringing back the power house
restrictions? Should email Gary and tell him his retirement is off
until this problem is fixed....

Final coordination results – The action will move forward as described.

After Action update – The PDT determined risk was too high to leave flow control
plates in A and B gatewells of all units. Unit outages have been scheduled to inspect and
remove plates by mid Sept. 2018. PDT working on long term solution. Evaluation of
alternatives resulted in a concrete alternative being preferred. Funding, scheduling,
regional coordination are underway and until a permanent fix is in place the rest of the
units would operate similar to what was coordinated in the MOC. All plates were
removed by September.

Unit priority change is not necessary and can go back to the FPP priority (or whatever the
current priority is coordinated under other projects).

Please email or call with questions or concerns.
Thank you,

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