

MEMORANDUM FOR THE RECORD 17 LMN 11 Returning Unit 2 to Service with Hydraulically Fixed Blades

SUBJECT: Lower Monumental Dam, Main Unit 2

Main Unit 3 was removed from service on August 22, 2017 due to suspected blade packing leakage. The Project removed the oil from the static oil head, drained the hub and hydraulically blocked the governor blade servo to speed the units' return to service. This procedure was successful and Unit 3 was brought back online September 12 at 0742 hrs. The temporary repair of unit 3 for the remainder of the 2017 fish passage season included 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.

The hydraulic block process was tested on Unit 3 first due to the location of its oil leak. It was determined that it would be easier to test the process on Unit 3 and use knowledge gained from the procedure to determine if it would also be effective for Unit 2. The leak on Unit 2 was located in a different location and there was uncertainty whether the blades could be blocked without the unit continuing to leak. After the process was completed and tested on Unit 3, it was determined it would also be effective for Unit 2. Since Unit 2 is the higher priority unit, it was decided to immediately complete the process on Unit 2 to increase attraction to the north ladder for adult passage.

Lower Monumental, Main Unit 2 was removed from service on August 2, 2017, due to suspected leaking blade seals. The project removed the oil from the head and drained the hub August 11 and has hydraulically fixed the blades in order to promptly return to service on September 21. Unit 2 blades are locked in a flatter position (approximately 19.5 degrees) allowing for generation in the lower 1% of peak efficiency with a target output of approximately 85 MW. The repair is temporary and expected to be utilized for less than 12 months. Unit 2 will become the priority adult attraction unit and will need to remain in operation as river flows decrease. Commissioning to test this blade angle conformity to estimated lower end of 1% efficiency range will occur during the same time period as Unit 3. This testing is expected to occur in mid-October.

Sincerely,
Chuck Barnes
Project Fisheries

From: Trevor Conder - NOAA Federal
To: Setter, Ann L CIV USARMY CENWW (US)
Subject: [EXTERNAL] Re: 17 LMN 11 Unit 2 fixed blade position
Date: Thursday, September 21, 2017 2:24:19 PM

Ann,

The lower end of 1% on unit 2 is preferred by NOAA. We just completed the LMN hydraulic modeling with unit 2 fixed at 11 kcfs and unit 3 at 19 kcfs and achieved acceptable results.

Trevor

From: Bill Hevlin - NOAA Federal
To: Setter, Ann L CIV USARMY CENWW (US)
Cc: Bill Hevlin
Subject: Re: [EXTERNAL] Re: 17 LMN 11 Unit 2 fixed blade position (UNCLASSIFIED)
Date: Tuesday, September 26, 2017 8:14:38 AM

Thanks Ann,

With the continued turbine maintenance problems and effort to spill more water next spring I think its important to keep a running tally of available turbines and when maintenance is planned to occur, so that we can have contingency plans ahead of unexpected problems.

bill

On Tue, Sep 26, 2017 at 7:19 AM, Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil <<mailto:Ann.L.Setter@usace.army.mil>>> > wrote:

CLASSIFICATION: UNCLASSIFIED

Bill - I have added replies to your questions below.

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

From: Bill Hevlin - NOAA Federal [<mailto:bill.hevlin@noaa.gov> <<mailto:bill.hevlin@noaa.gov>>]

Sent: Friday, September 22, 2017 9:48 AM

To: Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil

<<mailto:Ann.L.Setter@usace.army.mil>> >

Cc: Trevor Conder <trevor.conder@noaa.gov <<mailto:trevor.conder@noaa.gov>>> >; Bill Hevlin

<bill.hevlin@noaa.gov <<mailto:bill.hevlin@noaa.gov>>> >

Subject: [EXTERNAL] Re: 17 LMN 11 Unit 2 fixed blade position

Ann,

IN reading through this MFR, my understanding is that units 2 & 3 now have hydraulic blocks so they can continue operation in a fixed position. Unit 2 is blocked at a shallow angle to operate at the lower end of 1% and Unit 3 at a steep angle to operate at the high end of one percent. The choice of these blocks had to do with being able to operate unit 2 as priority unit nearly all of the time, am I correct? Yes

Unit 3 needs more water flow, so it will likely be last on and first off, right? Correct

What I am wondering is what will happen if unit two develops another leak, or some other problem, and needs to be shut down, will unit 4 or 5 be the next priority unit? Yes, likely - we are developing an MOC so further discussion can be had as needed.

bill hevlin