CENWW-ODD **January 14, 2022**

MEMORANDUM FOR THE RECORD: 22 DWR 01

SUBJECT: Dworshak Dam Operation December 21 and 27, 2021

On December 21, 2021, a standard swap between Unit 1 and 2 occurred to replace Unit 1 current limiting couplers inside the exciter (Figure 1). If done while the Unit is operating there is a risk of tripping the Unit offline forcing it out of service without the ability to use the depression air system. Unit 2 was started at 1150 hours with the unit being synced to the grid at 1051 hours. Unit 1 was taken offline and secured (given the stop command) at 1202 hours. Units were swapped back with Unit 1 started at 1402 and synced to the grid at 1404 hours. Unit 2 was brough offline and secured at 1202 hours. Unit 2 had been in standby for about a month prior to being started December 21.

On December 27, Unit 1 was removed from service for scheduled annual maintenance and cavitation repair (Figure 1). Unit 2 was brough online at 0547 hours and synced to the grid at 0550 hours. Unit 1 was taken out of service and secured at 0559 hours. December 27, Corps Biologist David Miller surveyed DWR tailrace in several location and did not observe any fish mortalities. There were no fish in the Unit1 draftube during the fish rescue December 27.

The depression air system procedure was used each time the Units were started and stopped. When a Dworshak unit is started the depression air system is utilized to provide a void (approximately 6') between the runner (Turbine) and the water to prevent fish contacting the runner. Once the unit is fully depressed the governor opens the wicket gates forcing water into the turbine providing torque to start spinning the generator to start the generator and the air void is filled with water as the unit ramps up to rated speed. Once a unit reaches full speed, discharge flow is sufficiently high to prevents fish from moving into the draft tube.

As reported by Don Whitney, Idaho Department of Fish and Game (IDFG; Lewiston Office) fish biologist at the January 13, 2022 FPOM meeting, on December 21, 2021, an angler left a phone message to IDFG reporting seeing fish mortalities in the Dworshak tailrace. Don Whitney received the message on December 22 and visited Dworshak Dam on December 23 where he confirmed observing about 30 fish mortalities in the tailrace of the dam. Jonathan Ebel, IDFG, notified Chris Peery and Elizabeth Holdren with the USACE of Mr. Whitney's findings on December 23 via email. A later review of security video footage of the tailrace by John Chatfield, USACE, was not able to identify any fish mortalities during the time of the operational changes.

An ROV inspection of DWR unit 3 draftube was conducted January 11, 2022 with USACE Biologist Elizabeth Holdren and NPT Biologist Sherman Sprague observing. There was a significant amount of unexpected flow in the draftube and no fish mortalities were observed, although at least one live steelhead was observed swimming in the draftube. There was 4+ mortalities observed in the tailrace downstream of the powerhouse between the Unit 2 outflow and the spillway wall (see photos). Corps Biologists will be monitoring the Dworshak tailrace

when Unit 3 is returned to service January 19 in hopes to gain information on what may have occurred during the December operations.

A. Species – NA
B. Origin – NA
C. Length – N/A
D. Marks and tags – NA
E. Marks and Injuries found on carcass – NA
F. Cause and Time of Death – NA
G. Future and Preventative Measures – Continue using depression air system.

Sincerely,
Elizabeth Holdren
Lead Supervisory Fisheries Biologist
Walla Walla District
Lower Granite Project
Ph. (509) 843-2263

Dworshak Generator Bay Data

21 Dec 2021

	Unit 1		Unit 2		Unit 3	
Date Time	Power (MW)	Flow (cfs)	Power (MW)	Flow (cfs)	Power (MW)	Flow (cfs)
1221 0100	59.7	1454	0.0	0	0.0	0
1221 0200	59.9	1455	0.0	0	0.0	0
1221 0300	60.2	1462	0.0	0	0.0	0
1221 0400	60.1	1462	0.0	0	0.0	0
1221 0500	60.4	1466	0.0	0	0.0	0
1221 0600	60.3	1466	0.0	0	0.0	0
1221 0700	61.0	1477	0.0	0	0.0	0
1221 0800	61.1	1480	0.0	0	0.0	0
1221 0900	60.2	1463	0.0	0	0.0	0
1221 1000	60.2	1463	0.0	0	0.0	0
1221 1100	60.4	1466	0.0	0	0.0	0
1221 1200	60.4	1466	0.1	14	0.0	0
1221 1300	1.2	41	59.4	1442	0.0	0
1221 1400	0.0	0	60.4	1465	0.0	0
1221 1500	49.7	1220	10.0	244	0.0	0
1221 1600	60.3	1467	0.0	0	0.0	0
1221 1700	60.8	1474	0.0	0	0.0	0
1221 1800	60.4	1465	0.0	0	0.0	0
1221 1900	60.4	1468	0.0	0	0.0	0
1221 2000	60.5	1471	0.0	0	0.0	0
1221 2100	60.4	1468	0.0	0	0.0	0
1221 2200	60.2	1465	0.0	0	0.0	0
1221 2300	60.0	1458	0.0	0	0.0	0
1221 2400	60.4	1470	0.0	0	0.0	0

27 Dec 2021

	Unit 1		Unit 2		Unit 3	
Date Time	Power (MW)	Flow (cfs)	Power (MW)	Flow (cfs)	Power (MW)	Flow (cfs)
1227 0100	64.0	1533	0.0	0	0.0	0
1227 0200	65.0	1554	0.0	0	0.0	0
1227 0300	64.5	1542	0.0	0	0.0	0
1227 0400	64.3	1540	0.0	0	0.0	0
1227 0500	64.8	1548	0.0	0	0.0	0
1227 0600	63.9	1532	0.8	44	0.0	0
1227 0700	0.0	50	65.2	1556	0.0	0
1227 0800	0.0	0	65.1	1555	0.0	0
1227 0900	0.0	0	64.9	1549	0.0	0
1227 1000	0.0	0	64.4	1543	0.0	0
1227 1100	0.0	0	65.1	1556	0.0	0
1227 1200	0.0	0	64.3	1540	0.0	0
1227 1300	0.0	0	65.2	1557	0.0	0
1227 1400	0.0	0	65.0	1554	0.0	0
1227 1500	0.0	0	65.1	1555	0.0	0
1227 1600	0.0	0	64.8	1549	0.0	0
1227 1700	0.0	0	65.2	1556	0.0	0
1227 1800	0.0	0	64.4	1542	0.0	0
1227 1900	0.0	0	65.0	1552	0.0	0
1227 2000	0.0	0	64.8	1548	0.0	0
1227 2100	0.0	0	64.5	1544	0.0	0
1227 2200	0.0	0	64.6	1545	0.0	0
1227 2300	0.0	0	64.6	1546	0.0	0
1227 2400	0.0	0	64.6	1544	0.0	0

Figure 1. Dworshak hourly operational data for December 21 and 27.

Photo 1. Live Steelhead in DWR Unit 3 draftube.

Photo 2. Fish mortalities in the tailrace downstream of DWR Unit 3.

Photo 3. Fish mortalities in the tailrace downstream of DWR Unit 3.

Photo 4. Fish mortalities in the tailrace downstream of DWR Unit 3.

Photo 5. Live Steelhead swimming in the tailrace. There were several in the location.

From: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Sent: Friday, January 21, 2022 8:02 AM
To: Baus, Douglas M CIV USARMY CENWD (USA) <Douglas.M.Baus@usace.army.mil>; Scott Bettin <swbettin@bpa.gov>; Blane Bellerud (blane.bellerud@noaa.gov) <blane.bellerud@noaa.gov>; Charlie Morrill <cfm97@me.com>; <<snip>>
Cc: Eskildsen, Robert CIV USARMY CENWW (USA) <Robert.D.Eskildsen@usace.army.mil>
Subject: RE: 22 DWR 01 MFR December 2127 Operations

FPOM,

As noted in the subject MFR, observers were present on the 19th for the switch from unit 2 to unit 3 at Dworshak. Below is the update from Elizabeth Holdren. Please let me know if there are questions.

Chris

Christopher Peery
Senior Fish Biologist
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Hi Chris,

DWR unit 3 startup sequence began January 19 at 1447 hours and the unit was synced at 1450 hours. There were 5 fishman and 1 Corp employee observing from the fishing wall, Chis Peery above unit 3 stoplog slot on the tailrace deck, Elizabeth Holdren with 2 NPT employees on the spillway wall, and two Corps employees in the tailrace observing from boat.

NPT brought a drone to survey the tailrace. After several attempts with technical difficulties is was thought

the factory may have programmed DWR tailrace as a no fly zone that prevented them from controlling/flying the drone.

There was one disoriented steelhead that was examined for injuries without being removed from the water. No injuries were found. The fish was released and swam away.

Three fisherman observing from the wall all stated they counted old 7 fish carcasses that were stirred up as the unit started. They observed no live fish with injuries, no recent mortalities, and no disoriented at that location. The other two fisherman on the wall were uncertain in the number and condition the fish they saw.

Elizabeth Holdren
Lead Supervisory Fish Biologist
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