COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

August 6, 2014
Facilitator's Summary
Facilitator: Emily Plummer; DS Consulting; Notes: Tory Hines, DS Consulting

Dworshak Operations

Steve Hall, COE-NWW, provided an update on water temperatures for Dworshak Operations. He noted that last week thunder storms moved through the region with high winds, resulting in temperature mixing in the water column to a depth of 15 meters. As indicated in the Snake and Clearwater water temperature data provided on the TMT agenda (http://www.nwd-wc.usace.army.mil/tmt/agendas/2014/0806_Agenda.html), water temperatures in the Lower Granite forebay approached 68 degrees Fahrenheit down to a depth of 15 meters. Steve continued that it is unlikely water temperatures will exceed 69 degrees Fahrenheit and the current planned operation is to continue discharge at full powerhouse through the entirety of the modelled period (8/11/14). Additionally Steve noted, after correcting models that had previously been run using wetter projections than the season is currently presenting, the project is expecting approximately full powerhouse discharge from now until the end of August in order to get down to the target elevation of 1535ft. He continued that if temperatures rise again in the following weeks the Corps will react accordingly, but it will mean they will end the month with less flow. Finally, Steve mentioned that the rise in water temperature that occurred yesterday in the Lower Granite Dam tailwater is in part due to an outage at Lower Granite due to the bushing work. With this outage and water temperatures mixing due to high winds, the spill water is in excess of 68 degrees Fahrenheit presenting challenges to the Corps to meet target temperatures in tailwater of 68 degrees Fahrenheit at Dworshak.

Lower Granite Dam T1 Neutral Bushing Outages:

Doug Baus, COE-NWD, provided a brief overview and update on the Lower Granite bushing repair operation. He noted that the maintenance was originally described in Appendix A of the Fish Passage Plan, and operations have been coordinated through FPOM, however, due to new information received from the contractor, temperature issues in the Lower Granite Dam tailwater relative to DWR outflows and the need for the Corps to make a decision on operations moving forward in a timely manner, the coordination is being brought to TMT. Corps expressed interest in gaining input from the Salmon Managers as to their preference of two options. Descriptions of Options 1 and 2 are provided on the TMT agenda. Doug noted that the Corps prefers Option 1 as it is the more expeditious than Option 2; however there was interest expressed at FPOM to break up the work over a longer period of time in order to limit potential impact to fish as a result of the outage. Rich Hilt, COE-LWG, provided explanation of the two options (see TMT agenda for details). Rich pointed out that T1 will remain out of service for the duration of the operation and T2 will come back on service intermittently.

Erick Van Dyke, OR, suggested postponing the bushing outages until after the fish passage spill season in September. Ann Setter, COE-NWW, noted that the work was coordinated with FPOM to occur in early to mid-August to minimize effects on adult sockeye and fall Chinook and also due to the likelihood of dry weather and need for low moisture content during transformer maintenance. Erick requested that the Corps provide the data used to determine that the likelihood of moisture in

August is greater than that in September. Dave Statler, Nez Perce Tribe, suggested that the Corps provide a description of the available work window to help inform future coordination of maintenance. Doug Baus reiterated historically in FPOM that outages for testing and maintenance are consistently coordinated to occur during this time period (August) to minimize impacts on adult Sockeye and fall Chinook as it is conducted in-between run timing. Doing it at any other time would be inconsistent with previous year's outages for maintenance in the Snake River.

Dave Wills, USFWS, asked Steve Hall, COE, on his professional opinion of how much the outage will impact overall water temperature? Steve noted that due to the current situation warmer water will be passing, and that it is possible that next week tailwater may exceed 68 degrees Fahrenheit. FPAC members requested a caucus to discuss their recommendation.

There was a suggestion to shift spill from the surface RSW to the deeper spillbays in order to pass cooler water and to offset warm water temperatures. There was also suggestion to reshape spill to a uniform spill in the middle and higher on the outer edges to minimize eddying and attract fish to the ladders. FPAC will explore these options and bring any recommendations to the next TMT meeting.

- **Action:** FPAC will caucus at 10:30 to determine if they will recommend Option 1 or 2 and respond to Doug Baus via email by 12:00 today. If FPAC would like to recommend an operation outside of Option 1 or 2, they will contact Doug to schedule another TMT meeting for this afternoon.
- **Action:** FPAC will discuss options to reshape spill and/or shift spill and will get back to TMT with any recommendations.
- **Action:** Erick Van Dyke will provide his data request, in writing to Doug Baus.

The next TMT meeting will be a face to face on August 13th at 9:00am.

Potential Agenda Items: Updates on Dworshak operations, Lower Granite bushing maintenance, Lower Snake River flow augmentation.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

August 6, 2014
Minutes: Pat Vivian

1. Introduction

Doug Baus, COE, chaired this TMT conference call facilitated by Emily Plummer, DS Consulting. Representatives of the COE, BPA, NOAA, Washington, USFWS, Montana, BOR, CRITFC, Oregon, Idaho, Nez Perce Tribe and others participated. This summary is an official record, not a verbatim transcript.

2. Dworshak Operations Update

Steve Hall, COE, reported. A series of wind storms on the Clearwater and Snake rivers mixed warm surface water in the reservoir down to a depth of 15 meters and resulted in temperatures approaching the 68 degrees F standard in the Lower Granite tailwater over the weekend. Additionally, a powerhouse outage for transformer maintenance occurred yesterday and temperatures increased to a peak of 67.57°F at 1800 hours.

The wind storms mixed the water column in the forebay so it is currently spilling water of 68.5 degrees F at a depth of 15 meters, which is where the deep spillbays (non-RSW) draw from the reservoir. This is increasing temperatures in the tailrace and making it more difficult to maintain temperatures below the tailwater standard. Based on data from an analog-year forecast, the water temperature modeling attached to today's agenda shows a slight rise in temperatures at the end of the modeling period August 11. Instead of the 12 kcfs Dworshak discharge Hall had suggested earlier, the current models indicate full powerhouse flows of 9.8 kcfs are needed to reach the 1535' end of August elevation target. Thus the operational plan for Dworshak is full powerhouse releases, a result of lower inflows than expected. This means any temperature augmentation flows released above full powerhouse in response to another heat wave could result in ending the month below 1535' elevation.

Another factor that helped raise Lower Granite tailwater temperatures was a powerhouse outage at Lower Granite yesterday (Tuesday, August 5) for transformer bushing work (see agenda item 3 below). This caused the Lower Granite tailwater temperature to peak at 67.5 degrees F as of Tuesday afternoon at 1800 hours. Russ Kiefer, Idaho, noted that the data had not been updated since yesterday morning, and Hall explained that yesterday's outage at Lower Granite for bushing repairs inadvertently interrupted power to the database computers and the project is working to restore the system to provide real-time hourly data. TMT will revisit Dworshak operations and Lower Granite tailwater conditions at its next meeting August 13.

3. Lower Granite Transformer #1 Neutral Bushing Outages

Doug Baus reported on recent developments in the plans to replace the transformer neutral bushings at Lower Granite Dam. As noted in Appendix A to the Fish Passage Plan, the Lower Granite outages have been coordinated at FPOM to happen in early to mid-August to coincide with the lull between adult sockeye and fall Chinook passage.

Based on new information from the contractor, the COE asked TMT to provide a recommendation regarding two options that differ slightly from the outage plans FPOM previously coordinated. Baus said the Action Agencies were requesting TMT's advice on an FPOM issue in an effort to address a time-sensitive issue as soon as possible, to be fully transparent with new information, to provide a quick response for the contractor, and to coordinate the decision closely with Dworshak operations since the two are related.

A detailed breakdown of the two options is linked to today's agenda. Option 1 ends the bushing outages sooner, while option 2 provides longer breaks from outages but extends the outage schedule by 3 days. Both options require a continuous transformer 1 outage, which takes units 1-4 out of service. The intermittent transformer 2 outages will take units 5 and 6 out of service.

The COE favors **Option 1** as being the most efficient**:**

- T1 units 1-4 would be continuously out of service from 6 am, August 11, through 5 pm, August 17.
- T2 units 5 and 6 would return to service every other day for 24 hours.

Option 2 was offered in response to salmon manager concerns based on previous FPOM coordination to provide breaks in the work schedule.

- T1 units 1-4 would be continuously out of service from 6 am, August 11, through 5 pm, August 20.
- T2 units 5 and 6 would return to service every other day for 48 hours.

Ann Setter, COE Walla Walla, and Rich Hilt, COE-Lower Granite, led a discussion of the two options. There was discussion of the best environmental conditions for scheduling these outages from both a fish management and engineering perspective, as well as the possibility of devising a third option. Hilt explained that any scheduling delays would mean extra contracting costs and might even require the contract to be re-bid, which would be prohibitively expensive. In addition to the bushing repairs, each transformer unit must be Doble tested, which involves verifying that all connections are functioning when the work is done. This will require an additional one-day outage of both T1 and T2 from 6 am-5 pm on August 17 for option 1. Regardless of which option is chosen, the project will operate one unit at speed-no-load (5 kcfs) in order to provide station service to power the lights and computers at the project, and the remainder of outflow will be spill.

Bill Hevlin, NOAA, asked whether spilling through the deeper tainter gates as opposed to the surface RSW spill would help cool the tailrace at Lower Granite. The current forebay elevation range is 735-6' (MOP +2) for navigation purposes, instead of the preferred MOP (733-4'). **NOAA** suggested shifting to a uniform deep spill pattern and closing the RSW and the **Nez Perce** supported this idea, but **Idaho** requested an FPAC caucus on it first. Ann Setter suggested providing uniform spill in the center of the spill bays and higher spill on the edges as a way to send more water downstream while lessening the risk of eddies on the powerhouse side of the river. Statler suggested a temperature interruption for navigation, but Hilt replied that could make the problem worse by pulling water from a warmer elevation in the reservoir.

Erick Van Dyke, **Oregon**, suggested waiting to do the bushing work until after fish spill season, but Setter reminded everyone the work has already been coordinated with FPOM to occur during the best time to minimize impacts on fish runs, given that it must be done in warm, dry weather. Waiting until after spill season would result in the outage occurring during the peak of the adult fall Chinook run, which is forecasted to be a record high this year. Furthermore, Hilt said even late August would bring cooler evenings and an increased risk of condensation in the bushings, which could lead to corrosion and electrical problems later, possibly even a major transformer outage. Van Dyke asked for more data regarding the impact of moisture on bushings and said he will make this request to the COE in writing.

Statler asked whether it's possible to start the T1 outages later than 6 am and Hilt said he would need a specific time proposal to answer that question. In response to questions from David Wills, **USFWS**, and Charles Morrill, **Washington**, about the relative temperature impacts of options 1 or 2, Hall said there are tradeoffs. Option 2 would allow more time for the wind mixing event to dissipate so cooler spill can be provided, but the extended timeframe increases the risk that more fish will start moving during the outages when evenings start to cool off.

The Salmon Managers agreed to caucus immediately after this TMT call, with the goal of recommending one of the two options and possibly identifying a third. After the caucus ended, Baus sent out an email identifying Option 1 as the FPAC-preferred option and the one to be implemented. TMT will follow up on Lower Granite bushing maintenance work at its next meeting.

4. Next TMT Meeting

The next TMT meeting will be in person August 13, with Dworshak/Lower Granite operations and the Lower Granite bushing outages on the agenda.

Name	***Affiliation***
Doug Baus	COE
Tony Norris	BPA
Paul Wagner	NOAA
Charles Morrill	Washington

David Wills	USFWS
Brian Marotz	Montana
Mary Mellema	BOR
Jim Litchfield	Montana
Kyle Dittmer	CRITFC
Scott Bettin	BPA
Doug Baus	COE
Bill Hevlin	NOAA
Steve Hall	COE Walla Walla
Joel Fenolio	COE
Lisa Wright	COE
Karl Kanbergs	COE
Heather Dohan	Puget
Tory Hines	DSC
Greg Lawson	Thompson Reutters
Rich Hilt	COE Lower Granite
Julie Doumbia	BPA
Ann Setter	COE Walla Walla
Erick Van Dyke	Oregon
Russ Kiefer	Idaho
Dave Statler	Nez Perce
Tom Lorz	CRITFC
Bill Proctor	COE