COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
July 10, 2017
Facilitator's Summary
Facilitator: Emily Stranz; Notes: Charles Wiggins, DS Consulting

The following Facilitator's Summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members. Official minutes can be found on the TMT website: http://www.nwd-wc.usace.army.mil/tmt/agendas/2017/

Ice Harbor Dam
Tony Norris, BPA, reported on a transmission system emergency that required an increase in generation at Ice Harbor Dam. On Thursday, July 6, high temperatures in the Tri-Cities and the failure of a transformer cooling fan required BPA to increase generation at Ice Harbor for one hour to maintain power supply to the region during the repair. This resulted in a temporary reduction in spill from 85% to 67% for that hour. Operations then returned to spilling per the FOP. Paul Wagner, NOAA, noted that he appreciated the prompt notice of the system emergency.

Dworshak Operations
Alfredo Rodriguez and John Heitstuman, Corps, presented on Dworshak operations. As coordinated at the July 5th TMT meeting, the Corps has been operating within the 121% TDG waiver, maintaining outflows around 10 kcfs. TDG levels in the tailrace are fluctuating between 117% early in the day to around 119% between 2 to 4 PM during the warmest part of the day. Water temperatures at Lower Granite have been variable, in part due to wind events mixing the warm surface water down deeper into the reservoir.

The weather forecast in the Clearwater basin is for a few days of cooler ambient temperatures before a warming trend. The Corps therefore proposed to bump discharge from 10 kcfs to approximately 10.5 kcfs daily average, taking care to keep total TDG levels at or below 120% (with a 1% buffer to allow the project to operate within the 121% TDG waiver). Depending on the conditions, the Corps may be able to move a bit more water during cooler temperatures (e.g., at night) and stay within the TDG waiver, or at times they may not be able to move as much. They will adjust operations accordingly with the intent of managing to the TDG waiver and keeping water temperatures below 68 degrees as possible.

- **CONSENSUS**: All TMT members present agreed that the Corps should increase outflows at Dworshak as needed to manage TDG within the 121% wavier with the intention of keeping Lower Granite tailrace water temperatures at or below 68 degrees. At the time of the meeting, it was expected that a 500cfs increase would be possible.

→ **ACTION:** The Corps will increase outflows at Dworshak Dam by about 500cfs (to 10.5 kcfs) to manage total TDG levels to target 120%, providing a 1% buffer so as not to exceed 121%. The operation will manage to TDG rather than flow to the extent possible, with the intent of maintaining water temperatures in the Lower Granite tailrace at or below 68 degrees. They will back off on outflows if conditions allow for a decrease while maintaining TDG limits.

TDG levels at the hatchery have been around 103%. Dave Swank, USFWS, noted that fish presently in the hatchery are smaller in size than during the spring 2017 operations, so are more susceptible to TDG. Some gas bubble disease has been observed in hatchery fish already. Spring Chinook are on an air oxygenation system, however, Coho and steelhead are not and thus are more vulnerable to higher TDG levels. He also noted that the hatchery is working on a "tweak" to the system that could reduce hatchery TDG levels by 1-2%. Jay Hesse, Nez Perce, requested that the TDG monitoring equipment is provided to the Nez Perce hatchery if available.

→ **ACTION:** John Heitstuman will coordinate with the Nez Perce hatchery to resupply TDG monitors and will connect with the USFWS hatchery to see if the vacuum degasser can be tweaked to improve TDG.

Scott Bettin, BPA, suggested that the region consider pulling the spillway weir at Lower Granite to help reduce water temperatures downstream. He suggested that this could aid in adult Sockeye passage and the amount of spill would not change. The TMT agreed to discuss this option at their meeting on Wednesday, July 12th.

→ **ACTION:** TMT will consider removing the Lower Granite spillway weir at their next meeting on July 12th.

Little Goose Dam

Aaron Marshall, Corps, reported that on July 7, Little Goose increased the forebay operating range to MOP + 0.5 in order to maintain navigation safety at the entrance to the navigation lock in the tailrace of Lower Granite Dam. The trigger to implement the increase in MOP is specified in the FOP and is a tailwater elevation of 633.0ft at Lower Granite.

As a result of the operation, Lower Granite tailwater elevation increased from 633.0 feet to 634.2 feet. This provides the necessary 15ft of water depth over the navigation lock sill. Aaron noted that if Snake River flows recede in the future, Little Goose may have to increase to MOP + 1ft to maintain the minimum 15' water depth over the Lower Granite navigation lock sill.

The next TMT meeting will be a conference call on July 12 at 9:00.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

July 10, 2017
Minutes: Pat Vivian

1. Introduction

Representatives of the COE, Washington, NOAA, BPA, Idaho, USFWS, Nez Perce Tribe, BOR, BPA, and others participated in today's TMT conference call chaired by Lisa Wright, COE, and facilitated by Emily Plummer, DS Consulting.

2. Ice Harbor Transmission Emergency

On July 7 during a hot spell, a transformer cooling fan failed in the Tri Cities area and the transformer was taken off line for repairs, Tony Norris, BPA, reported. BPA declared a system emergency and increased generation at Ice Harbor Dam to keep the lights on in the Tri Cities. As a result, spill at Ice Harbor dropped from 85% of outflow to about 67%, for about an hour. As soon as the emergency ended, Ice Harbor returned to spilling per the Fish Operations Plan.

Paul Wagner, NOAA, thanked BPA for the early notice via email the same day the emergency occurred. FPAC will discuss it tomorrow in its regular Tuesday call. If the Salmon Managers decide further discussion is needed, Wagner will bring it up at the next regular TMT meeting July 12.

3. Dworshak Operations

Alfredo Rodriguez and John Heitstuman, COE Walla Walla, reported on how Dworshak Dam is being operated to balance TDG management in the Dworshak tailrace with temperature augmentation flows for the Lower Snake River.

3a. Current Operations Data. Dworshak is still releasing 10 kcfs as coordinated at TMT last week. This will continue unless TMT recommends a change.

3b. TDG Report. Total dissolved gas saturation levels have been just below 120%, reaching 119% + with a peak of 119.7% in the afternoons from 2-4 pm. Early morning and evening levels are 117-118% TDG saturation.

3c. Snake and Clearwater Temperatures. There's a 1.0-1.5 degrees F difference between deeper and surface water temperature in the Lower Granite forebay, which could change if wind causes the reservoir to mix and turn over.

With a weather forecast of cooler temperatures over the next 2-3 days followed by another hot spell, the modeling indicates that maintaining Dworshak at 10 kcfs outflow over the next 10 days will not be sufficient to keep Lower Granite tailwater temperatures below the 68 degrees F BiOp threshold.

The COE model also analyzed the effects of releasing 12 kcfs instead of 10 kcfs. This would probably bring about a temperature reduction and increased TDG, but the best option looks like 10.5 kcfs as a daily average discharge. The goal is to release as much cool water as possible without violating the terms of the water quality waiver: TDG levels are not to exceed 121% as an instantaneous value. A factor to consider is that flow changes at Dworshak take 2-3 days to reach the Lower Granite tailwater.

3d. Dworshak National Fish Hatchery Collection Channel Total Dissolved Gas. John Heitstuman recommended 10.5 kcfs out as a daily average outflow. It will probably not violate the terms of the TDG waiver, but the situation needs to be watched closely.

The Salmon Managers gave their views of bumping up Dworshak outflows to 10.5 kcfs as a daily average:

After conferring with Dworshak National Fish Hatchery managers, Dave Swank, **USFWS**, supported a 500 cfs increase in average daily releases. The hatchery would prefer no increase for the sake of small fish, but managers also recognize the need for temperature control at Lower Granite. Heitstuman emphasized that Dworshak discharges will be adjusted to diurnal temperature fluctuations (cooler temperatures result in lower TDG) in order to maintain compliance with the water quality waiver. That means flows might exceed 10.5 kcfs if temperatures are low, or drop below 10 kcfs if it gets hot. The summer hatchery fish are much smaller and younger than the steelhead smolts exposed to high TDG levels this spring. There is concern about how well these fish will withstand extended TDG exposure.

Scott Bettin, BPA, asked whether the air oxygenation system was working to bring down TDG in the raceways. He recalled that the hatchery didn't have this tool for degassing this spring. However, Swank added, only spring Chinook can benefit from the oxygenated water. Coho and steelhead are still vulnerable to high TDG exposure.

USFWS will follow up with TMT on how well the degassing system is working.

Jay Hesse, **Nez Perce**, supported the 500 cfs increase in Dworshak outflows. Raceway TDG levels tend to be about 103% when Dworshak tailwater levels are around 120% TDG like they are now. He asked the COE if they would provide TDG monitors for the Nez Perce hatchery as they did this spring.

The COE will make arrangements to deliver TDG monitors to the Nez Perce Hatchery.

Russ Kiefer, **Idaho**, and Charles Morrill, **Washington**, also supported a 500 cfs increase in Dworshak outflows.

Julie Ammann clarified that the **COE** will manage Dworshak to a target of 120% TDG, not to exceed 121% as an instantaneous reading. Based on daily modeling, Dworshak discharges will be adjusted to this limit, exceeding 10.5 kcfs in temperature flow augmentation whenever conditions allow.

3d. NWS Forecast for Lewiston, Idaho. Charles Morrill asked whether thunderstorm activity in the Clearwater Basin might intervene. No, the forecast for Lewiston is sunny and hot, Russ Kiefer, Idaho, replied.

3e. Water Temperature Comparisons. The last hourly reading at Lower Granite tailwater was 68.3 degrees F, with a current reading of 68.2 degrees F at the moment, Lisa Wright, COE, reported.

Scott Bettin, BPA, suggested shutting down the RSW at Lower Granite and spilling the same level through the deeper spillbays. This would release water from deeper in the reservoir, which is 1.0-1.5 degrees F cooler than surface spill.

Wagner said FPAC will discuss that suggestion tomorrow morning and bring their recommendation to TMT in the July 12 conference call.

Temperatures at Anatone may be higher than usual because the temporary probe is only 2 ft deep and is affected by sunlight, Heitstuman reported. A temporary probe was installed because the permanent probe at 10 ft deep has a broken rope.

In response to TMT's discussion today, the COE will increase Dworshak releases from 10 to 10.5 kcfs as a daily average, not to exceed 121% TDG in the Dworshak tailwater as an instantaneous value. TMT will revisit Dworshak operations in a conference call two days from now.

4. Little Goose Dam

Aaron Marshall, COE, reported. On July 6 at 11 pm, with Little Goose forebay in the 1-ft MOP range (633.0-634.0 ft) and outflows at 47.7 kcfs, the Lower Granite tailwater elevation dropped to 632.9 ft, violating navigation safety standards. Lower Granite tailwater has to be at least 633.0 ft elevation to provide the 15 ft of depth required over the sill at the downstream entrance of the Lower Granite navigation lock. So on Friday, July 7, the Little Goose

forebay operating range was increased to MOP +0.5 ft (633.5-634.5 ft) in order to maintain a minimum of 633.0 ft in the Lower Granite tailwater.

After the change, Little Goose forebay operated from 633.7-634.5 ft with discharges ranging from 47-64 kcfs. The lowest hourly tailwater elevation at Lower Granite this weekend was 633.3 ft. Little Goose forebay is currently at 634.2 ft, with releases of 47.5 kcfs; Lower Granite tailwater is at 634.2 ft.

Flows on the lower Snake River are forecasted to recede gradually over the summer, so the Little Goose forebay operating range might need to be increased to MOP+1 in order to maintain adequate clearance at the Lower Granite navigation lock. While the FOP gives 50 kcfs as an approximate flow for triggering MOP+ operations at Little Goose, the actual threshold is a tailwater elevation of 633.0 ft at Lower Granite.

Regarding adult sockeye conversion rates, Russ Keifer said Snake River sockeye are migrating well and there appear to be no problems at present.

5. Next TMT Meeting

TMT will meet next in a conference call July 12.

Name	***Affiliation***
Lisa Wright	COE
Charles Morrill	Washington
Paul Wagner	NOAA
Tony Norris	BPA
Russ Kiefer	Idaho
Dave Swank	USFWS
Jay Hesse	Nez Perce Tribe
Chris Runyon	BOR
Scott Bettin	BPA
Julie Ammann	COE RCC
Aaron Marshall	COE
Eric Chau	COE
Alfredo Rodriguez	COE Walla Walla
John Heitstuman	COE Walla Walla
Gunnar Leffler	COE Walla Walla
Wayne Jousma	COE Walla Walla
Charles Wiggins	DSC
Ann Setter	COE Walla Walla
Michael Bryant	CBB