COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
May 17, 2017
Facilitator's Summary
Facilitator & Notes: Emily Stranz; Support: Colby Mills, 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/

Review Meeting Minutes
The TMT approved the April 19th Facilitator's Summary and Official Minutes. There was request for another week to review and edits the May 10th summary and minutes; the TMT will revisit these at next face-to-face meeting.

Dworshak Dam Unit 3 Outage Update
Steve Hall, Corps, reported that the Corps has found significant deficiencies in stator bars that contractor has produced for Unit 3 overhaul and has officially rejected those bars. Steve noted that the insufficiency is due to issues with insulation, voids, and incorrect dimensions. He continued that the bars need to be very specific and accurate and the Corps is currently in negotiations with contractor as to what happens next. Previously at TMT, Steve reported a July 15 return to service date; however, this is no longer the case. The schedule is changing day to day, and in Steve's opinion, Unit 3 will likely not be available for summer flow augmentation. There is not yet an official schedule update to provide, however, Steve assured the TMT that as soon as he has an update he will report back to the TMT.

The group discussed the need to determine contingency plans and priorities for Dworshak operations during the summer flow augmentation season. It was noted that Idaho and the Nez Perce are in discussions now to determine their joint recommendation in preparation for requesting a TDG waiver. Steve noted that ideally the entire TMT will inform and get behind those recommendations. The challenge will be to balance TDG levels and cold water releases from Dworshak as flow capacity will be limited and in order to release the flow needed to cool the Snake, there will be high TDG levels.

Steve noted that they are working with the downstream hatchery to improve the oxygen system to increase oxygen levels in the raceways. Additionally, the joint water supply in the pipeline will help reduce TDG in the raceways. Steve requested TMT members to bring forward any other ideas to explore.

4. Operations Review
***Reservoirs*:** John Roache, BOR, reported on Bureau of Reclamation projects:

- Hungry Horse midnight elevation was 3,534.8ft, current discharge is 10.1 kcfs, inflows are 10kcfs. The project is spilling 5 kcfs and 2 units are operational.
- Grand Coulee midnight elevation was 1,241.1ft; the project is operating per flood control objectives.

Lisa Wright, Corps, reported on US Army Corps of Engineer projects:

- Libby midnight elevation was 2,377.9, current inflows are 34.1 kcfs, discharge is 24.2 kcfs and is at full powerhouse. The sturgeon pulse operation started on Monday as coordinated at TMT, and will continue through next Monday.
- Albany Falls midnight elevation was 2,059ft, yesterday's average inflow was 87.1kcfs and outflows were 79.7kcfs.
- Dworshak midnight elevation was 1,554.2ft, inflow yesterday was 17.3kcfs and discharge was 6 kcfs.
- Lower Granite average outflows were 158.7 kcfs.
- McNary average outflows were 423.8 kcfs.
- Bonneville average outflows were 435.7 kcfs.

Fish: Paul Wagner, NOAA, reported on fish. He noted that passage is lower than desired and at Bonneville is in the 30% range of the 10-year average for passage for this time of year. This trend is noticeable throughout the Columbia and Snake Rivers. Paul continued that it is common for runs to delay in years with high flow and high spill conditions. Salmon Managers are looking into high fallback rates at some of the projects, specifically of concern is McNary. Detections of PIT-tagged adults indicate both Bonneville and The Dalles have low fallback rates (most are only detected ascending the ladder once); however, at McNary, t only 85% of the detections are unique, meaning 15% have been detected ascending the ladder

more than once . This high re-ascension rate is unusual, although McNary often causes high fallback under high flow, high spill conditions.

Paul noted that there have been days where the re-ascension rate is higher than others and wondered if there are any operations that could help reduce fallback. Trevor Condor, NOAA, shared that he examined the data and found that when spill reaches 65% of the outflow or the spill is around 300kfcs, the re-ascension rate goes from a linear to an exponential increase – from 5-10% up to 20%. He continued that they saw this same threshold in mid-May 2011 and that it is auto-correlated with the river flows; other environmental conditions have not been compared.

Scott shared that there are 12 of the 14 units in operation at McNary currently and the two outages will be long-term. The group talked about options to change the turbine operating capacity to move more water through the turbines and decrease the likelihood of spilling more than 65% or 300kcfs. If the turbines were operated above the 1% operating range for approximately 2 kcfs per unit, an additional 24-28kcfs could be shifted from spill to the turbines. This could be done for all hours of the day if desired. It was noted that this operation could potentially help adults, which is especially important this year with the low returns; however, would result in passing slightly more juveniles through the turbines or bypass instead of the spillway.

The re-ascension rate is calculated using PIT tag detections; the N is low, however, nearly all of the fish detected re-ascending were destined for upstream of the project.

It was noted that the high inflows at McNary are forecast to persist for the next 10 days. Erick noted that he cannot easily monitor changes to unit operations and thus it is difficult to understand the change and whether it is making a difference. Doug pointed out that if the operation is implemented, the hourly data posted to the public website would show a noticeable increase in generation of approximately 24 kcfs and a decrease in spill of approximately 24 kcfs. Also, PIT-tag data are available to monitor adult re-ascension rates and evaluate whether the operation is having the intended effect.

FPAC requested more time to discuss and review the data. The TMT agreed to set a placeholder to reconvene at 1:00 on Thursday, May 18th to discuss options to implement operations at McNary to improve adult passage.

→ **ACTION**: FPAC will discussion options to improve adult passage at McNary and if needed, the TMT will reconvene at 1:00 on May 18th to coordinate.

Paul continued his report out on fish. He noted that to date, 33,798 adult spring Chinook have passed Bonneville; at Lower Granite passage is at 1% of 10-year average. Paul reiterated that this is an unusual year: flows are high, spill is high, and temperatures are cool. Russ noted that ID is starting to be concerned regarding adult passage at Little Goose - only 315 have passed so far this year, whereas approximately 1,500 have passed Lower Monumental so far this year.

For juveniles, passage continues and they are likely midway to past the peak of passage for yearling spring Chinook as well as Steelhead at the mainstem projects. In terms of Gas Bubble Trauma (GBT), Paul reported: BON: 6% (all rank 1); LGS: 5% (all rank 1 and 2); MCN: 1% (all rank 1); Rock Island: 21%; and LoMo: 22% (rank 1, 2, and 3).

Water Quality: Laura Hamilton, Corps, reported that there are high levels of TDG in the system. On May 16, TDG was 141% below Grand Coulee. When TDG levels are high in the forebays, both Chief Joseph and Lower Monumental Dams degas; Chief Joseph degassing is currently around 6%, but can get up to 22% and Lower Monumental Dam degassing is currently around 4% but can get up to 14%. There have been reporting issues with water quality and project data; so it was not available for web reports. The Corps is working on this and hopes to get it resolved soon.

Power System – Scott shared that there is nothing to report.

The next TMT meeting will be a conference call on May 18th at 1:00, followed by a call on May 24th at 9:00.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 17, 2017
Minutes: Pat Vivian

1. Introduction

Representatives of the COE, NOAA, Idaho, Umatilla, Colville, and Nez Perce tribes, BOR, BPA, Oregon, NPCC and others participated in today's TMT meeting chaired by Doug Baus, COE, and facilitated by Emily Plummer, DS Consulting.

2. Review Meeting Minutes – April 9 and May 10

The April 9 facilitator's summary and meeting minutes were approved as final. Approval of the May 10 summary and minutes was deferred until the next TMT meeting to allow more time for review.

3. Dworshak Dam Unit 3 Update

Steve Hall, COE Walla Walla, reported. The COE has formally notified the contractor performing the Dworshak Unit 3 overhaul that their shipment of stator bars is being rejected for significant deficiencies, specifically inadequate insulation and not conforming to required clearances. The bars will probably need to be refabricated, a lengthy process. The COE and the contractor are negotiating next steps.

This means the Unit 3 overhaul will take longer than expected, and the return to service date is no longer July 15. Hall said his personal opinion – no official estimate is available at this time – is that Unit 3 won't come back on line in time for summer flow augmentation this year, maybe not until after the end of August. The schedule is slipping day for day as negotiations proceed. The COE will update TMT when more is known.

Erick Van Dyke, Oregon, requested a milestone report at the next TMT meeting, which Hall said the COE will provide as soon as information is available. Tom Lorz, Umatilla, asked the Action Agencies to begin working now with Idaho and the Nez Perce Tribe on TDG waivers to allow increased augmentation flows out of Dworshak this summer without Unit 3.

Hall said these conversations are already taking place. The COE intends to file a joint request for TDG above 110% with Idaho and the Nez Perce Tribe as soon as possible. Idaho and the Nez Perce have the biggest stake in the outcome, but the request should also reflect the other Salmon Managers' viewpoints.

The biggest issue will be limits on TDG exceedances. Should they be 120% total dissolved gas (TDG)? 130% TDG? These limits need to be established in the joint request, and the waiver will probably be needed before July 15, the earliest date Unit 3 might have been available.

Russ Kiefer said Idaho agrees with the COE on the need for a waiver. Dave Statler, Nez Perce Tribe, said the biggest issue this summer will probably not be TDG but temperatures, primarily in the lower Snake River and at Lower Granite Dam. Is there is a contingency plan in place for alternative operations that could offer relief?

Hall said the only tool in the toolbox he's aware of is hatchery systems that increase oxygen in the raceways. If anybody else has viable alternatives, the COE would be willing to fast-track them. Operations this summer will be a balancing act of juggling temperature management and TDG control. The COE and the Nez Perce will confer offline this week in preparation for summer flow augmentation. The COE will update TMT as soon as possible on the Unit 3 overhaul.

4. Operations Review

4a. Reservoirs. John Roache, BOR, and Lisa Wright, COE, reported. Hungry Horse is at elevation 3534.8 ft with 10.1 kcfs releases, of which 5 kcfs is spill with two units operating. Inflows are 10 kcfs and expected to rise when temperatures do. Grand Coulee is at elevation 1241.1 ft operating to flood control objectives.

Libby is at elevation 2377.9 ft with inflows of 34.1 kcfs, discharging full powerhouse flows of 24.2 kcfs. On May 15, the sturgeon pulse began as coordinated at last week's TMT meeting. Full powerhouse flows will continue for the next week.

Albeni Falls is at elevation 2059 ft with inflows of 87.1 kcfs and releases of 79.7 kcfs. Dworshak is at elevation 1554.2 ft with inflows of 17.3 kcfs and releases of 6 kcfs. Lower Granite discharges are 158.7 kcfs, McNary discharges are 423.8 kcfs, and Bonneville discharges are 435.7 kcfs.

4b. Fish. Paul Wagner reported.

Adults: Passage has been disappointing to date, with 33,798 spring Chinook adult returns to Bonneville – about 30% of average for this time of year. Migration upriver is slow due to high flow and spill on the Columbia and Snake rivers. Spring Chinook passage at Lower Granite is only 1% of the 10-year average, which is reflective of an overall trend this year.

Even with high spill the detection of unique PIT-tags (fish detected in the ladder only once) is 98% at BON, which means fallback and re-ascension (fish detected passing more than once) is only 2%. Re-ascension rates are also low at TDA with a unique detection rate of 97%. But unique detections decrease to approximately 80-85% at McNary, indicating 15-20% re-ascension rates. This is typical under high flow and spill conditions.

Yesterday FPAC did not discuss adult fallback and re-ascension at McNary, Wagner reported. The May 10 re-ascension rate was 22%, and some days are better than others. He wondered, is there an operation that could reduce fallback? Recently BPA proposed a contingency reserves operation that would increase flow through the turbines above the 1% range by approximately 2 kcfs per unit in order to decrease TDG levels. There's also the question of turbine outage scheduling and when turbines will return to service. It appears

there's a threshold of approximately 65% spill at McNary that increases re-ascension rates dramatically.

The tradeoff involves passing slightly more juveniles through the powerhouse in order to reduce high spill to improve adult passage and minimize delaying their upstream migration. TMT needs to monitor this to see if the trend persists under different flow and spill conditions. Wagner asked BPA to provide information on the status of turbine operations at McNary and the schedule for bringing them back on line, as well as any plans to step up turbine operations. With low numbers of adults in the river, it seems prudent to protect this year's returns.

Scott Bettin, BPA, said 12 of the 14 units at MCN are in service, so if MCN passed 2 kcfs per unit more through the powerhouse around the clock, the project could reduce spill by 24-25 kcfs.

Russ Kiefer asked whether there's any indication that re-ascension rates increase at a particular flow and spill level. Once spill hits 60-65% of river flow, or more than 300 kcfs over the spillway, re-ascension shifts from 5-10% to 20%, a trend also observed in 2011, Trevor Conder, NOAA, replied. Because fallback also correlates to river flow, it's hard to determine whether total flow or spill is actually the cause of increased fallback.

Erick Van Dyke, Oregon, asked whether the time of year has anything to do with fallback and re-ascension rates. In 2011, like this year, problems emerged in mid-May, Conder replied. At McNary, fallback rates are linear up to 300 kcfs spill, then they increase exponentially. This pattern is unique to McNary, while Bonneville is more linear, with only a 2% increase in re-ascension per 100 kcfs of increased spill regardless of volume. To date, 10-25 fish have been detected re-ascending at MCN. It was noted the 2011 data are more precise than this year's data due to larger numbers of fish.

Baus reported the 10-day inflow forecast shows continued high inflows. Total discharge at McNary today was 426.5 kcfs, with 141.6 kcfs of that in generation and 280 kcfs as spill. Erick Van Dyke asked whether these levels were correlated to river flows, and the answer was no. Tom Lorz asked whether Conder looked at fish origin in his analysis, and the answer was no, just spill. Lorz pointed out that with the small number of fish this year, it wouldn't take too many destination overshoots to bias the fallback rate. Kiefer reported that PIT-tag data indicate the 133 adults detected re-ascending McNary to date are destined for the lower Snake River, so they are not overshoots.

Scott Bettin reminded everyone that running the available units up to full load under the contingency reserves proposal discussed at previous TMT meetings could reduce spill by 2 kcfs per unit.

Van Dyke asked for more clarity on the outage schedule, particularly the effect of any changes. While the unit outage schedule isn't published, Bettin and Baus said they would give TMT members outage information for specific units. Van Dyke said Oregon is having trouble getting enough information to document what's happening. If an action is going to increase powerhouse passage for juveniles, Oregon would oppose it.

The Salmon Managers decided to caucus tomorrow so USFWS and Washington representatives who are on the road today could participate in the conference call. They scheduled an FPAC call tomorrow morning, May 18, followed by a possible TMT call at 1 pm if needed.

Idaho is concerned that adult passage at Little Goose appears to be lagging, with 1,500 passing Lower Monumental and only 315 passing Little Goose to date. Re-ascension rates appear to also be higher than normal at Ice Harbor according to fish counts.

Juveniles: Passage is still in progress, past the peak for both spring Chinook and steelhead at mainstem projects.

Julie Ammann, COE, asked about GBT monitoring. On May 13, 6% of all fish sampled at Bonneville had rank 1 GBT symptoms, Wagner replied. On May 15, 5% of fish sampled at Little Goose had GBT symptoms, with four having rank 1 and one having rank 2 symptoms. On May 16, only 1% of fish sampled at McNary had GBT rank 1 symptoms. On May 10, 22% of fish sampled at Lower Monumental had GBT symptoms; 18 of those were rank 1, three rank 2, and one rank 3.

4c. Water Quality. Laura Hamilton, COE, reported. With Grand Coulee spilling 130-150 kcfs, TDG levels in the Chief Joseph forebay have been increasing. As CHJ spill increases, the river degasses more, which is unique to CHJ due to the flow deflectors. The average degassing rate is about 6.2% but today it's climbing to 12% and it can go as high as 22%, when water from Grand Coulee reaches Chief Joseph forebay with TDG saturation levels of 141%. In a similar phenomenon, Lower Monumental has been degassing the river, but not as well as Chief Joseph does. Lower Monumental and Chief Joseph both have noteworthy degassing rates.

The COE has been having technical difficulties posting data on the TMT public website, particularly from lower Snake project and water quality data. These data are available on the Corps Walla Walla database node but haven't been populating the TMT site reports. The COE is working on a permanent fix for this.

4d. Power. There was nothing to report today.

5. Next TMT Meeting

TMT set a placeholder of 1 pm tomorrow, May 18, for a possible conference call to discuss fallback at McNary Dam.

Name	***Affiliation***
Doug Baus	COE
Julie Ammann	COE
Lisa Wright	COE
Paul Wagner	NOAA
Laura Hamilton	COE
Colby Mills	DSC
Michelle Yuen	COE

Phone:

Russ Kiefer	Idaho
Tom Lorz	Umatilla
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Dave Statler	Nez Perce
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Erick Van Dyke	Oregon
Brian Zeigler	Snohomish PUD
Steve Hall	COE
Margaret Filardo	FPC
Leslie Bach	NPCC
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Shane Scott	PPC
Jay Hesse	Nez Perce