

## **COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM**

March 21, 2018

Facilitator's Summary

Facilitator: Charles Wiggins; Notes: Nancy Pionk, 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/2018/>

### **Meeting Minutes and Summaries**

The TMT Minutes and Summaries for February 28, 2018 and March 14, 2018 were approved.

### **Dworshak Operations**

Steve Hall, Corps, reported on current and proposed operations at Dworshak. He presented several charts that are available on the TMT web site. Current reservoir elevation is 1465 ft. with 6.3 kcfs inflows and 14 kcfs discharge. TDG levels are 122% in the river and 104.5% in the hatchery. The current water supply and inflow forecasts suggest a consistent rise in water supply from 2.8 maf, with an inflow spike of 16-17 kcfs due to precipitation hitting the basin. Additionally, night temperatures are expected to be below freezing. The reservoir will continue to draft until approximately March 23, and possibly March 24-27 if the inflow forecasted materializes. They should achieve end of month flood control.

For the long-term forecast, the climate forecast has changed significantly. For the 6-10 day forecast, there is a higher probability of colder/drying weather. The 8-10 day forecast is expected to be neutral to a little warmer, with a higher probability of drier conditions. For the 30-day forecast, there is an equal chance of below normal to above normal precipitation. For the 90-day forecast, there are equal chances on temperature and precipitation.

Steve presented graphs showing the Snotel readings for Snow Water Equivalent (SWE) for 2018 vs. prior years. Crater Meadows and Hemlock Snotel are tracking 2012. He noted that Crater Meadows had seen a little slower accumulation. An upcoming storm is expected to result in an uptick of snow accumulation. Hoodoo is below the analog years and Lolo Pass is tracking 2011. Lost Lake is setting records right now with a very high amount of snow. Lost Lake is expected to peak out around mid-April. Other areas are still following the trend of analog years with several still tracking 2011.

Steve presented series of slides showing models of proposed operations using water years 2008, 2011, 2012, and 2014. He noted that they are replacing mechanical governors with digital governors and will be doing some testing that will require unit outages that keep outflow at the 14 kcfs level. During that time, generation will be fluctuated between Units 1 and 2, balancing with spill to hold a constant outflow.

Steve noted a fair amount of fluctuation with the weather forecast later in the month. The official Water Supply Forecast for the end of March is below 3 maf; however, a greater than 3 maf season is more than likely. The Corps overall water supply forecast is 3.1 maf. Steve noted that it is very possible to have a major inflow event and be in flood operations. They will run an early bird forecast as the end of the month gets closer. The Corps must plan for drafting to 1445 by the middle of April. Steve noted they are doing everything they can do balance the impacts on fish. Salmon managers requested flexibility in the event the inflow does not occur as forecast. The Corps is willing to work with Salmon managers to the extent possible, given the forecast.

### **Systems Operation Request (SOR) - Operation of RSW at Lower Granite Dam**

Paul Wagner, NOAA, discussed the SOR for operation of the RSW at Lower Granite Dam starting March 25 and continuing through spring spill that starts April 3. The request for this alternate route is being made due to several factors: installing screens and JBS operations are delayed until the week of March 26 or later, which is after the start date of March 25 called for in the Fish Passage Plan; and to support early fish releases from the Dworshak hatchery. Because of contractor delay, the completion of screen installation has been pushed back to March 28, and the earliest that testing (condition sampling) could occur is March 29. Additionally, the testing of the juvenile bypass system has also been delayed. The Corps confirmed that the RSW could be ready to operate by March 25. The Corps will get back to TMT by the end of the week with coordination on the start and how the timing will work.

### **Spill Priority List**

Dan Turner, Corps, presented the draft Spill Priority Lists for March 23-March 31 and April 1–August 31. The lists define how lack of load spill will be distributed to projects in order to manage TDG on a system-wide basis. This list is not connected with the fish passage spill. There are no changes from last year in the order of projects. Dan noted that when the list identifies the spill level as “to be determined,” the spill level will be based on conditions that are observed in the river at the time and determined on a daily basis. Salmon Managers agreed with the Priority List order.

### **Lower Snake River Dams - Transport Operation and Timing**

Paul Wagner reported that the Salmon Managers had discussed when to start transport collection. The current proposal (which is not supported by all Salmon Managers) is to start collecting fish for transport on April 23. A decision on this issue was deferred until the April 4 TMT meeting. This will allow agencies time to continue discussion and to elevate objections, if necessary, to RIOG. The Corps will need to get information to the projects on transport by April 16. The team will check on the status of this at the next TMT meeting on March 28.

### **Methodologies to Monitor Adult Passage in the Snake River**

Russ Kiefer, IDF&G, reported that the methodologies were being developed and looked promising so far. He expressed thanks to everyone who helped with the guidelines, including the Fish Passage Center and DART. He noted that the Fish Passage Center is getting close to rolling out their version. The next update will be at the April 4 TMT meeting.

## Updated Power System Emergency Plan

Tony Norris, BPA, presented on proposed updates to the FCRPS Emergency Plan and Contingency Action List. This purpose of the updates is to true up the language in the Appendix to the TMT Emergency Protocol with language recently added to the spring Fish Operations Plan (FOP). References to megawatts were removed to reduce confusion. The list is grouped by project, with increments of reduction that are prioritized within each project. Tom Lorz, Umatilla, raised a concern about listing the following action as “pre-emptive”, given that it would have an impact on fish:

- *Store water outside of MOP or MIP to increase generation at specific projects if time allows this to occur. Taking this action will either maintain fish spill levels or reduce the spill reduction if there is insufficient flow to do both.*

The group will discuss these updates further at the March 28, 2018 TMT meeting. Tony would like to have the updates finalized by April 3, 2018.

## Operations Review

**Reservoirs:** Joe Fenolio, BOR, reported on Bureau of Reclamation projects:

- Hungry Horse midnight elevation: 3506.7 ft., current discharge 11.5 kcfs; inflows 2 kcfs, currently targeting 3496 ft. by the end of March.
- Grand Coulee midnight elevation 1,251.4 ft., with current discharge 94 kcfs; inflows 108 kcfs. The target for the end of March is 1240.5 ft.

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

- Libby midnight elevation was 2,366.1 ft.; current inflows were 4.1 kcfs; outflows were 14 kcfs.
- Albeni Falls midnight elevation was 2,051.3 ft.; yesterday’s average inflow was 23.4 kcfs; outflows were 23 kcfs.
- Dworshak midnight elevation 1465.8 ft.; inflows were 6.8 kcfs; outflows were 14 kcfs.
- Lower Granite average outflows were 61.9 kcfs.
- McNary average outflows were 179.4 kcfs.
- Bonneville average outflows were 203.4 kcfs.

## Fish

Paul Wagner reviewed Fish Passage Center data regarding fish passage.

He noted a substantial bump in smolts due to hatchery releases.

He also noted that 15,000 juvenile Lamprey were recorded at John Day and a few were also found at the Grande Ronde trap. With regard to adults, he noted 8 Spring Chinook counted at Bonneville and less than 100 Steelhead a week passing. Steelhead numbers at Lower Granite were also picking up.

## Water quality

Dan Turner reported on water quality. John Day is spilling due to unit outages. The TDG level is 114% at John Day and 109% at Ice Harbor.

### **Power Supply**

Tony Norris noted that everything was within bounds.

**The next regular TMT meeting will be a conference call on March 28, 2018, at 9:00.**

**Columbia River Regional Forum**  
**TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES**

**March 21, 2018**  
Minutes: Pat Vivian

**1. Introduction**

Representatives of the Nez Perce Tribe, CRITFC/Umatilla Tribe, BPA, Oregon, USFWS, COE, Washington, NOAA, BOR, Montana, Yakama Nation, Idaho and others participated in today's TMT meeting chaired by Julie Ammann, COE, and facilitated by Charles Wiggins, DS Consulting.

**2. Meeting Minutes – Feb 28 and March 14**

The facilitator's summaries and official minutes for both of these meetings were approved as final.

**3. Dworshak Operations**

Steve Hall, COE Walla Walla, gave an update on Dworshak operations and conditions in light of ongoing concerns about high TDG levels in the river downstream of the dam and in hatchery raceways.

**3a. Hourly Data.** Dworshak reservoir elevation is at 1465 ft, with inflows of 6-7 kcfs and discharges of 14 kcfs.

**3b. NWRFC Water Supply Forecast North Fork Clearwater – Dworshak Dam.** The River Forecast Center's water supply forecast for April–July is just under 2.9 maf.

**3c. Dworshak Hourly TDG Data (tailrace and hatchery).** Total dissolved gas levels are consistently around 122% saturation in the river, and 104.5% saturation in Dworshak National Fish Hatchery raceways.

**3d. NWRFC Dworshak Dam Inflow Forecast.** The RFC is forecasting a spike in inflows to 16-17 kcfs due to precipitation. However, nighttime temperatures are expected to remain below freezing. The reservoir will continue to draft with outflows of 14 kcfs until March 23. If the forecasted spike materializes, the reservoir elevation will rise slightly on March 24, then drop down to meet its end of month flood control elevation on March 27, followed by a reduction in flows to accommodate early hatchery releases at the end of March.

**3e. NWRFC Climate Forecast.** The long term forecast has changed significantly since TMT last met. The 6-10 day forecast indicates a higher

probability of colder and drier conditions. The 8-10 day forecast is a significant change from earlier predictions. The 8-14 day forecast predicts neutral to warmer weather than the last report, with a higher probability of dry conditions. The 30 day forecast is closer to the pattern seen earlier, with an elevated chance of below normal temps and above normal precipitation. The 90 day forecast shows an equal chance of above or below normal temperatures and precipitation.

**3f. Snow Water Equivalent 2018 vs. Previous Years.** Hall showed TMT modeling traces linked to today's agenda that compare snow water equivalents at various locations throughout the basin in 2018 to the four analog years.

All four years (2012, 2014, 2008 and 2011) are tracking 2018 closely. A storm in the next few days is expected to build snowpack, especially at higher elevations such as the Crater Meadows SNOTEL station at 6,000 ft. Hemlock Butte station is considered mid elevation at 5,800 ft. Snow accumulation at Hoodoo has been relatively flat, trending lower than each of the other analog years because the northeastern corner of the basin has gotten drier than it was earlier. Lolo Pass at the southeastern edge of the basin is tracking 2011 closely, but there is still snow accumulation to come. Lost Lake, a high elevation station at 6,100 ft in the northwestern corner of the basin, is setting snowpack records. Cool Creek in the middle of the basin and Shanghai, a lower elevation station, are both tracking the analog years closely, especially 2011.

If the weather over the next few months turns out to be drier and warmer than usual, the hydrograph can be expected to follow the 2008, 2012 and 2014 traces shown on this plot. If it stays cold and wet, it can be expected to follow 2011 more closely.

In moderate water years, inflows tend to peak in mid-April, while in high water years snowpack keeps building into May as the traces show. If 2018 follows 2011, that would mean another month and a half of snow accumulation, especially at high elevations.

**3g. DWR Operational Scenarios.** Steve Hall presented six graphs depicting potential operations at Dworshak Dam.

1. The first scenario uses analog 2011 inflows, combining the STP forecast with the 10 day RFC forecast. It shows that holding 14 kcfs out until the drop to 12 kcfs for the March 28-29 smolt releases would result in meeting the end of March flood control elevation, but discharges would need to go to 16 kcfs to meet the April 15 flood control elevation.
2. The second scenario depicts Hall's proposal to discharge 20 kcfs over the coming weekend in order to allow flows of 10 kcfs until the end of March and still meet the April 15 flood control requirement. The goal is to give

fish a significant period of lower TDG exposure, but they would experience high TDG levels over the coming weekend.

3. The third option shows water year 2008 water year traces using the RFC inflow forecast. Inflows in 2008 were very low at the end of March and early April, the opposite of what's expected now. If the 2018 hydrograph follows 2008, DWR discharges could back off to 10 kcfs, then 8 kcfs until the April 15 flood control elevation is met. After that, discharges would go to minimum flows for refill.
4. The fourth option shows 2011 water year traces using the RFC inflow forecast. This scenario shows inflows of 15 kcfs and releases of 14 kcfs, dropping down to 12 kcfs at the end of March for the hatchery release. After that, 23 kcfs would need to be discharged to meet the April 15 flood control target.
5. The last option, based on the 2012 water year, shows no change through the end of March, but would result in discharges of 20 kcfs in April until the flood control curve intersects the refill curve.
6. The final scenario, based on the 2014 water year, shows an increase to 18 kcfs for the first half of April, but this is hard to predict because it's unknown when the flood control curve will intersect the refill curve (most likely mid to late April). Hall reminded everyone the project will pass inflows after reaching its April 15 flood control elevation until flood control intersects the refill curve.

In response to the second scenario, Dave Swank said USFWS appreciates the exploration of additional options, but several days of 20 kcfs would be too much for fish that have already experienced high levels of TDG for 2 weeks or longer. USFWS would prefer to hold 14 kcfs out for now. He asked for confirmation that outflows will be kept down to 14 kcfs until April 2 when they rise to 16 kcfs, and Hall said the COE would do that if possible.

Mandatory governor testing of units 1 and 2 on April 2 may result in decreased turbine flow that day and will help keep reservoir levels down (this operation is not depicted on any of the graphs).

Tom Lorz asked how the RFC inflow forecast relates to actual observations of inflows; Hall said it has been tracking well at 80% of predicted inflows. The COE expects runoff to increase, but not as high as the RFC forecast is showing, given that temperatures are expected to drop below freezing and limit snowmelt. Low elevations in the basin will definitely produce runoff, but the higher elevations are likely to remain locked in snow.

Lorz asked for the overall water supply predictions; Hall said the mid-month water supply forecast is for 3.1 maf runoff volume, noting there's not much practical difference between this forecast and the RFC forecast of 2.9 maf. If the forecast is less than 3 maf, that should give the Action Agencies enough flexibility to refrain from drafting another 20 ft out of Dworshak reservoir, Lorz replied. Would there be flexibility to reduce discharge and not draft DWR reservoir to 1445 ft unless there's a big jump in inflows? Most of the Columbia and Willamette basins are dry, with the exception of Dworshak basin. Lorz said it would be helpful to include 2017 in the graphical comparisons, which Hall said he will do.

The COE will run an early bird forecast next week, which will give a better indication of the official April forecast. The current forecast shows no signs of dropping below 3 maf, Hall said. This means Dworshak is required to operate to an April 15 flood control elevation of 1445 ft. As April 15 approaches, it will be easier to determine when refill will start. For now, the plan is to draft the reservoir to 1445 ft by mid-April. The COE is very concerned about fish, but has to balance that concern with flood risk. Low elevation snowpack could melt off at any time, and a spike in inflows could transform the Dworshak operation into a flood control emergency.

Paul Wagner asked whether the Action Agencies will reduce Dworshak discharges to 12 or even 10 kcfs if inflows come in lower than projected, shifting that water into April. TMT will address this in its next meeting, a March 28 conference call.

#### **4. SOR 2018-1**

Paul Wagner, NOAA, presented this request on behalf of the Salmon Managers. It asks the Action Agencies to provide RSW spill at Lower Granite Dam from March 25 through April 3 when spring spill starts on the Snake River. Signatories to the SOR include USFWS, NOAA, Idaho, Oregon, Washington, the Nez Perce Tribe, Colville Tribe, and CRITFC-Umatilla.

There are two justifications for the SOR:

1. Installation of fish screens in the juvenile bypass system was to be completed by March 24 per the Fish Passage Plan, but has been delayed by problems with the emergency bypass hatch lifting system. Operating the RSW would compensate for the lack of screens and JBS.
2. The second justification is the early release of Dworshak hatchery fish prior to spill season due to high TDG levels in the raceways. Opening the RSW would give these fish an alternative to turbine or untested JBS passage.

Ann Setter, COE Walla Walla, asked why mitigation is needed before April 3 if the screens are installed by the end of March. It's needed to accommodate the early release of fish from Dworshak Hatchery, as well as other fish migrating in the basin, Wagner said. Also, the upgraded JBS system won't be tested in time for the start of spill season, Swank said. Until the screens are in place, there's no way to know how well the upgraded JBS is performing.

Swank clarified that the spring Chinook and steelhead in systems 2 and 3 will be released on March 29-30, and steelhead still on station will be released on April 2.

Setter clarified that condition sampling of the JBS will start the day after screens are installed in the turbines. The latest update indicates screens will be installed on March 28, not March 26, which means condition sampling will start on March 29.

Scott Bettin asked, what about closing the RSW after the JBS is operational until the hatchery releases show up? We tried to come up with a fish abundance trigger and it doesn't work, Lorz said. Wild fish will also be passing Lower Granite prior to screening the turbines, Swank said. Hatchery fish are headed to Lower Granite from other areas in the basin, Jay Hesse added. Alternative passage is needed until the JBS has been confirmed as a safe route. It makes sense to provide an alternative for hatchery fish that have already been stressed by high levels of TDG, Charles Morrill said. Bettin asked why the SOR requests RSW spill starting March 25 if the Dworshak fish won't have arrived yet. Wild fish are already showing up, Morrill said.

The COE will coordinate with project staff on whether it would be possible to implement the SOR, Julie Ammann said. The Action Agencies will report back to TMT on this before the end of the week.

## **5. Spill Priority List**

Dan Turner, COE, led coordination of two draft spill priority lists, the first covering March 21-31 and the second, April 1 to no later than August 31. The lists rank projects for spill due to lack of load or lack of market conditions, with the goal of managing TDG system-wide. Each list has three levels of spill, Level 1 at 110% TDG in the tailwater, Level 2 at 115% TDG, and Level 3 at 120% TDG and above.

For March 21-31, the projects are listed in the same order as last year, starting with Lower Granite and working downstream through the Snake and Columbia. Last on the list for Level 1 spill are The Dalles, Bonneville, Chief Joseph and finally Grand Coulee. The Level 2 list omits Dworshak.

When the State water quality standard modifications are in effect, April 1-August 31, Level 1 spill is the state standards, so projects that are already spilling to the gas cap for FOP spill will be skipped over for lack of load spill. Level 2 spill defines spill levels for 120% TDG in the same order for the fish passage projects, starting with Lower Granite; Level 3 spill to 125% TDG does the same.

Paul Wagner said this list looks good. Erick Van Dyke, Oregon, asked how spill caps are set; Turner said they are based on observed conditions in the river. Spill caps will be set on a daily basis and fluctuate throughout spill season.

There were no objections to the spill priority lists, so they will be implemented as posted to today's agenda.

## ***6. Lower Snake River Dams – Transport Operations and Timing***

Paul Wagner, NOAA, recommended starting fish collection for transport on the lower Snake River on April 23 this year. This is a change from prior years when the start date for fish collection and transport was May 1.

The biological rationale for starting early is that a change in timing has become apparent over the past 4 years. ISAB has always advocated spreading the risk of transport, which isn't possible if 50% of the run has already passed by the time transport starts. Starting earlier than May 1 will allow more information to be collected on the earliest part of migration, and collecting data on the complete run will aid in decision making going forward.

Wagner noted that fish are collected earlier than April 23 for PIT tagging at Lower Granite, but are bypassed and returned to the river, which will continue.

Charles Morrill, said FPAC discussion of this topic did not reach consensus, but with gas cap spill, **Washington** would not object. A key observation in the FPC analysis is the confidence intervals are very wide, although there does not appear to be a benefit in earlier transport. Lorz agreed that **CRITFC/Umatilla Tribe** would not object to an April 23 start date as long as all projects are spilling to the gas cap.

However, Dave Swank said **USFWS** has serious concerns about this proposal; his upper level managers are working on resolving their concerns by the time a decision needs to be made. Erick Van Dyke said **Oregon** would probably object to an earlier transport date but not elevate the issue to RIOG, although that could change. The **Nez Perce** perspective is that it's important to clarify what will be done with the fish once they are collected, Jay Hesse said. Deciding when to start transport is ultimately relative to existing collection

efficiencies under an assumed spill operation to the gas cap. That's the **COE** assumption as well, Lisa Wright said.

Swank asked, what's the process if the Salmon Managers don't reach consensus? The options are support, no objection, objection, and objection with elevation to RIOG, which means RIOG representatives decide, Wright said. The elevation process takes time, which means April 4 is the deadline for deciding whether this needs to be elevated to RIOG, although elevation could happen sooner. Swank advised against elevating it now because USFWS management is still seeking answers from NOAA on their concerns.

There was general agreement that more coordination is needed among the Salmon Managers and at the Action Agency level on this issue. The Salmon Managers will prepare to decide by next week whether to elevate the start of transport to RIOG, and TMT will revisit this in its April 4 meeting two weeks from today. Project staff would need a decision by April 16 in order to start collecting fish on April 23.

## ***7. Methodologies to Monitor Adult Passage in the Snake River***

Russ Kiefer, Idaho, gave an update on this effort to provide better ways of monitoring adult passage for in season management. The FPC and DART researchers are developing methodologies, and the results to date are promising. Both groups are getting ready to publish their final versions.

The tools and analyses in the reports should offer improved ways of understanding fish passage on the Snake, Swank and Kiefer agreed. The Salmon Managers can use the information for adaptive management when project-specific passage problems arise. Kiefer will keep TMT apprised on publication of these reports, and TMT will revisit this issue April 4.

## ***8. Updated Power System Emergency Action Plan***

**8a. FCRPS Power System Emergency Action Plan.** As previously announced at TMT, BPA is updating its Power System Emergency Action Plan, Tony Norris reported. It is posted on the TMT page as an appendix to the TMT emergency protocol.

Recently, significant language was added to the spring FOP to align it more closely with power system operations as described in the Power System Emergency Action Plan. These preemptive actions are essentially unchanged from past years except for an added option of storing water above MOP to increase generation. As an example of how this option was used successfully, the ability to store water above MOP at Ice Harbor allowed for additional generation without cutting spill and kept the lights on in the Tri-Cities area during a heat wave and period of peak demand last year.

BPA is always open to suggested changes to the Power System Emergency Action Plan. None of the contingency actions will be taken unless BPA declares a power system emergency.

**8b. Contingency Actions List.** Norris presented a suggested change to this list of actions for the Salmon Managers to review. Instead of prioritizing the actions in terms of power production (MW), the measures are grouped by project. BPA is open to comments on this list at any time. Unless changes are made, the contingency actions list would be used in a power system emergency.

Lorz commented that adding MOP to the preemptive list has fish implications the other options don't have. Last year modeling became more rigorous, so BPA would know a day in advance when a project needs to operate above MOP, Scott Bettin said. The Salmon Managers might add some levels to the list, particularly re: gas cap spill at Bonneville, Lorz said.

TMT will revisit the contingency actions list in its next meeting, a conference call on March 28. The goal is to finalize power emergency operations planning by the start of spill season on April 3.

## **9. Operations Review**

**9a. Reservoirs.** Joel Fenolio, BOR, and Lisa Wright, COE, reported.

Hungry Horse is at elevation 3506.7 ft with outflows of 11.5 kcfs and inflows of 2 kcfs, targeting an end of March flood control elevation of 3496 ft. The April 10 target elevation is 3489.5 ft. Grand Coulee is at elevation 1251.4 ft with outflows of 108 ft and inflows of 94 kcfs. The end of month flood control elevation is 1240.5 ft.

Libby is at elevation 2366.1 ft with inflows of 4.1 kcfs and outflows of 14 kcfs. Albeni Falls is at elevation 2051.3 ft with inflows of 23.4 kcfs and outflows of 23.0 kcfs. Dworshak is at elevation 1465.8 ft with inflows of 6.3 kcfs and outflows of 14 kcfs.

Lower Granite average outflows are 61.9 kcfs, McNary outflows are 179.4 kcfs, and Bonneville outflows are 203.1 kcfs.

**9b. Fish.** Paul Wagner reported.

Juveniles: A bump in spring chinook yearling passage at the White Bird trap on the Salmon River on March 14 was related to a hatchery release, although wild fish passed as well. Passage numbers in general are picking up

at the White Bird trap, and the same is true at the Grande Ronde trap, while fewer numbers are being collected at the Lewiston trap.

Lower Granite is passing some fish, with a high index count of 23 this week. Hatchery releases passed John Day on March 17 and 19, but so far Bonneville has not seen much smolt passage. Some subyearlings, predominantly fry, are passing Bonneville.

Not many coho have passed yet. A few steelhead are being collected at Little Goose – 24 on March 16 and 24 again on March 20. Sockeye showing up at Little Goose are largely kokanee due to spill at Dworshak. Lamprey passage is going well. John Day passed 15,000 lamprey on March 19, and Bonneville is also passing lamprey.

Adults: At Bonneville, 8 spring chinook adults arrived today. Wild and hatchery steelhead adults are passing upstream at a rate of less than 100 a week. Overwintering steelhead are beginning to pass Lower Granite.

**9c. Water Quality.** Dan Turner, COE, reported. Involuntary spill at John Day due to turbine outages is producing TDG of 114% saturation downstream, and 109% downstream at Ice Harbor. Forebay gages on the lower Snake will begin operating at the end of this week, and on the lower Columbia at the beginning of next week.

Lorz asked when the turbine units will be back on line at John Day and Ice Harbor. Unit 2 at John Day is supposed to come back on line this week, Wright said. The COE will provide an update at a later TMT meeting.

**9d. Power System.** Tony Norris, BPA, showed TMT the latest wind generation and load balancing data on the BPA web page.

## **10. Next TMT Meeting**

TMT will meet in a conference call March 28, with the FCRPS emergency action plan and a Dworshak operations update on the agenda, as well as a discussion of whether to elevate the start of Snake River transport to RIOG. The next TMT meeting in person is April 4.

<b>Name</b>	<b>Affiliation</b>
Jay Hesse	Nez Perce
Tom Lorz	CRITFC/Umatilla
Tony Norris	BPA
Erick Van Dyke	Oregon
Nancy Pionk	DS Consulting
Dave Swank	USFWS
Julie Ammann	COE

Charles Morrill	Washington
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Michael O'Bryant	CBB
Eric Chow	COE
Russ Kiefer	Idaho