

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 8, 2009 Meeting

FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Robin Gumpert

Notes: Erin Halton

The following notes are a summary of issues that are intended to 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.

Review of Minutes/Agenda

The following edits to the 4/1 official meeting minutes were made during the meeting:

- In the Little Goose Low Flow section, change "spill" to "flow".
- In the FOP section, under Bonneville, change "1,000" kcfs to "100".
- In the Dworshak Operations section, Kyle Dittmer referred to the "Columbia River Forecast Group".

As Rick Kruger, OR, had additional edits to the 4/1 facilitator's notes, TMT decided to finalize both sets of 4/1 and 4/8 notes at the 4/22 TMT meeting.

Water Supply Forecasts

Jim Adams, COE, referred TMT to several links posted to the TMT agenda to the River Forecast Center's (RFC) April final water supply forecasts. Adams also referred TMT to the COE's updated forecasts for each project; he noted that overall, most projects have a water supply forecast that has increased 5-10% from their March forecast. Adams reported that Libby had an RFC April-August forecast of 88% of average and a COE forecast of 90% of average. John Roache, BOR, reported that the Hungry Horse May-September (which determines flood control curves) RFC forecast was 96% of average and the BOR forecast was 99% of average (May-Sep volume of 1816 kaf). Roache reported that Grand Coulee had an April-September forecast of 92% of average and The Dalles had an April-August forecast of 89% (up 8 MAF, a significant increase, from the March forecast.) Roache clarified that The Dalles forecasts drive flood control targets at Grand Coulee. Steve Hall, COE, reported that Dworshak had an RFC April-July volume forecast of 102% of average and the COE forecast was 99% of average; Hall said the COE has a high level of confidence in their forecast for Dworshak, as their regression forecast was also 99% of average. The end of April flood control elevation target for Dworshak remains 1515.6', and the un-shifted April 15 flood control elevation is 1502.8'.

Dworshak Operations

Steve Hall, COE, referred TMT to an ESP graph posted as a link to the agenda; the COE's anticipated inflows to increase from 10 kcfs to 15 kcfs as April progresses. As the gas cap criteria is approximately 14 kcfs, Hall said it will be highly unlikely that the COE will drop outflows below 14 kcfs anytime in April. Hall gave TMT a head's up the COE is having internal discussions as to the possibility of filing for a variance from the mid-

month flood control target; due to the significant change in forecast, the COE expects to miss April 15 and might also miss the April 30 elevation target as well. Hall added that the COE has a high probability for refilling the project while maintaining discharges of at least 5-6 kcfs during refill (May and June). As conditions can change rapidly, the COE will continue to perform thorough systems analysis as the month progresses. Kyle Dittmer, CRITFC, noted that from a meteorologist perspective, the outlook looks good for conditions staying cool with average precipitation. The COE acknowledged that forecasts are considered as they make risk management decisions. Paul Wagner, NOAA, said so far the current and forecasted operation looks good from a fish perspective.

Action/Next Steps: The COE planned to increase discharges up to 15 kcfs later in the day; this item will be on the agenda for the 4/22 meeting.

Grand Coulee Operations

John Roache, BOR, reported that the project did achieve its end of March elevation target of 1281.6' and was operating to meet Vernita Bar flow targets. Roache said the dramatic increase in the forecast for The Dalles has dramatically decreased the end of April flood control elevation for Grand Coulee and gave TMT a head's up that the BOR estimates the April 30 target will be in the range of 1256-1258' and the April 15 target will be in the range of 1272-1275'. Grand Coulee will begin drafting soon, probably by April 9, in order to achieve the April 15 and April 30 flood control elevations. Salmon Managers noted the conditions look good from a fish perspective.

Action/Next Steps: The official flood control elevation will be determined on Thursday, April 9. This item will be on the agenda for the 4/22 meeting and updates will be posted to the TMT webpage as the month progresses.

Little Goose Low Flow Operations

As follow up from the 4/1 meeting, Dan Feil, COE, reported that hourly data observed on 4/5 showed flows were consistently above 50 kcfs, so the project returned to a MOP-MOP+1 operation, with pool elevation ranging between 633-634'. Feil said that this 30% spill operation (outflows ranging from 50-60 kcfs) was having no adverse impact on the downstream navigation sill depth at Lower Granite. The COE will continue to closely monitor the system. TMT will likely need to revisit this item in July.

Operations Review

Reservoirs: John Roache reported on BOR projects: Hungry Horse was at elevation 3508.48' with outflows of 1.8 kcfs and Grand Coulee was at elevation 1281.4'. Jim Adams reported on COE projects: Libby was at elevation 2403.5' feet with outflows of 4 kcfs and inflows in the range of 2-3.5 kcfs. Albeni Falls elevation was 2052.04', with inflows of 16.5 kcfs and outflows of 16.1 kcfs; the end of April target elevation range is 2054-2056'. Dworshak was at elevation 1532.3' with outflows ramping up to 15 kcfs and a plan to hold as closely to the 110% TDG criteria as possible. 7-day average inflows were 60.7 kcfs at Lower Granite; 143.8 kcfs at McNary and 162.2 kcfs at Bonneville. Spill was planned to begin on the four lower Columbia River projects at one minute after midnight on 4/10.

Fish: Paul Wagner, NOAA, reported that juveniles were picking up, with passage rates of 1-2,000 per day at most upper Snake River projects. Adult migration appears to be later than the 10-year average but tracking closely with recent past years; Wagner referred TMT to the Fish Passage Center website to compare 2008 to 2009 data.

Power System: Nothing to report at this time.

Water Quality: Jim Adams directed TMT to the spill link on the TMT home page, and noted that TDG had been fairly low throughout the system up until the previous weekend, when Ice Harbor TDG went up to 116% in the forebay. As a result, flows were ramped down to 27 kcfs on 4/6; the COE planned to monitor TDG closely and lower the flows further if levels were still high by 4/10.

Other: Dave Wills, USFWS, informed TMT that the Spring Creek Hatchery release was scheduled for Monday, 4/13. The WMP and FOP describe an operation similar to that implemented in 2008, with operations at the low end of 1% at B2 and shifting remaining flows to B1 up to full capacity within the 1% range, then going back to B2 only if spill would exceed gas cap limits. Wills added that 90-95% passage would likely take 3-4 days. The COE and USFWS will coordinate closely to make sure operations align with unit tests planned for this year.

Action: The COE will email operational specifics out to TMT members next week and report back to TMT at the 4/22 meeting.

Next TMT Meeting: April 8: at NOAA

Agenda items include:

- Notes review
- Hanford Reach Update
- Dworshak Operations
- Grand Coulee Operations
- The Dalles Construction Status and Planning Update
- May Release – Spring Creek Hatchery
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
April 8, 2009**

1. Introduction

Today's TMT meeting was chaired by Jim Adams (COE) and facilitated by Robin Gumpert (DS Consulting), with representatives of COE, NOAA, BPA, USFWS, BOR, CRITFC, and others participating. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for March 25 and April 1, 2009

There were changes to the March 25 official minutes: Under Section 9, Little Goose Low Flow Operations, the second paragraph refers to spill, which should be flow. Under Bonneville in the section covering the Fish Operations Plan, 1,000 kcfs should be 100 kcfs. In the April 1 minutes, the federal interagency group referred to on page 7 is officially called the Columbia River Forecast Group. The revised minutes will be re-posted to the TMT page. Review of the April 1 facilitator's notes was postponed until the next TMT meeting.

3. Water Supply Forecasts

Links were included on today's agenda to RFC water supply forecasts for Libby, Hungry Horse, Albeni Falls, Grand Coulee, Dworshak, Brownlee, Lower Granite and The Dalles dams as of April 7. Most of the projects have seen a 5-10% increase in flows over the past month, due to more precipitation throughout the basin than was forecast, Adams reported. The April-August early bird forecast for The Dalles is 8 maf over the March final forecast, a dramatic change, Tony Norris (BPA) said.

Libby – The current RFC and COE forecasts for April-August are close, Adams reported. The RFC's forecast is 5,500 kaf, 88% of average. The COE forecast was 5,672 kaf, 90% of average. That's an increase of more than 300 kaf over the COE's end of March forecast for the same period.

Hungry Horse – The RFC forecast for April-September is 96% of average, John Roache reported. BOR does a May-September forecast, which is used to establish flood control rule curves, and an April-August forecast, which is used to determine minimum flows below the project and at Columbia Falls. The Columbia Falls minimum flows, based on the March final forecast, is 3,500 cfs and the minimum flow below Hungry Horse is 900 cfs for the rest of 2009 until BOR releases its January 2010 forecast. For May-September, the forecast was 1,816 kaf, 99% of average. The April-July forecast was 1,978 kaf, 99% of average.

Grand Coulee – The April-September forecast is 92% of average, an increase of 4% from the March final forecast, which was 88% of average. There was further discussion of Grand Coulee operations under section 5 below.

The Dalles – The April-August forecast is 82.4 maf, 89% of average, an increase of 9% over the end of March forecast, which was 80% of average. That's a huge increase in comparison to the previous forecast. This increase in inflow projections will impact Grand Coulee operations, Roache said (as discussed below in section 4). The Dalles is the control point for system flood control, Norris noted.

Lower Granite – The April-August forecast is 21.5 maf, 94% of average. This represents almost a 25% increase over the March forecast, which was 75% of average, also a dramatic change.

4. Dworshak Operations

Stephan Hall (COE) led a discussion of Dworshak operations in light of current inflow predictions. The RFC forecast for April-July, the period of concern, is 2.7 maf, 102% of average, with the RFC and COE forecasts in close agreement. The end of month elevation is therefore 1,515.6 feet, a crucial elevation that will be difficult to reach. The unshifted April 15 elevation is 1,502.8 feet, also a critical number primarily due to the change in the Grand Coulee forecast. However, getting the reservoir down to that elevation would require excessive outflows, probably more than 25 kcfs, because there are just a few days left to get the water out by April 15. For Grand Coulee to accept an April 15th shift, it must draw down below its normal flood control elevation by the April 15th in order to absorb an April shift of reservoir space.

Hall showed TMT a graph comparing the ESP traces for various scenarios, linked to today's agenda. None of the traces – including average inflows, 25% and 75% inflows, with a potential operation of 14-15 kcfs outflows through April – show Dworshak reaching its shifted April 15 flood control elevation of 1,515 feet. The unshifted April 15 flood control elevation is 1,502.8 feet. It's unlikely that target will be met, unless there's a major change in forecasted inflows. The COE is therefore planning to request a variance to be above required flood control on April 15. This problem is a direct result of shifting March flood control space to Grand Coulee, combined with a big change in the inflow forecast, Hall said.

There's a high probability the project will refill while maintaining an average discharge during refill of 5-6 kcfs. While this paints a good picture for fish, it is a risky situation in terms of flood control, Hall emphasized. There's a high likelihood the COE will spill above TDG limits at some point this spring if conditions deteriorate rapidly. Maintaining the current operation of 5-6 kcfs

outflows would allow the project to fill by the beginning of June, which would be dangerous from a flood control standpoint.

The likelihood of a “pineapple express” is low, Kyle Dittmer (CRITFC) replied. Current conditions suggest that this spring will be a borderline La Nina season, with below-normal temperatures and late runoff like last spring, so flooding is unlikely. Nevertheless, the headwater projects are susceptible to thunderstorms, Norris said, and it wouldn’t take a major rainstorm in the basin to produce a dramatic rise in inflows.

These factors will be analyzed as part of the COE’s request for a deviation from the April 15 flood control target, Hall said. Getting to 1,503-1,510 feet elevation would require outflows in excess of 25 kcfs. That said, the COE’s current strategy is to ramp up to 15 kcfs outflows and release as much water as possible without exceeding the gas cap. That operation is expected to draw the reservoir down to 1,522-3 feet elevation by the end of April. The local flood control elevation is 1,537.8 feet, higher than the reservoir elevation at present.

The current operation has been beneficial so far for fish, Paul Wagner (NOAA) said. TMT will revisit Dworshak operations at its next meeting on April 22. Meanwhile, the COE will notify TMT of any significant changes via email.

5. Grand Coulee Operations

John Roache (BOR) gave an update on Grand Coulee operations. The reservoir hit its March 31 flood control elevation of 1,281.6 feet. The April 10 objective is 1,281.9 feet based on the end of March forecast, a target the BOR has been trying to meet while maintaining 60 kcfs flows below Vernita Bar.

The large increase in the inflow forecast for The Dalles means flood control challenges for BOR as well as COE. Roache gave TMT preliminary ranges where flood control elevations will be for April 15 and April 30. The end of April elevation for Grand Coulee will be in the 1,256-8 range, as opposed to 1,281.7 feet, an increased draft of 20-25 feet of water. The April 15 target was 1,282 feet and is now in the 1,272-5 foot range. The BOR will start drafting soon, probably tomorrow, in an effort to maintain a smooth operation while targeting the new April 30 flood control elevation.

6. Little Goose Low Flow Operations

Dan Feil (COE) gave an update. Since last week’s TMT meeting, the COE carried out the plan to start a MOP+1 operation at Little Goose when spill began on April 3. Beginning on April 5, flows were consistently greater than 50 kcfs for over 24 hours, so the COE issued a teletype instructing the project to shift Little Goose pool operation to the MOP-MOP+1. Outflows seem to holding steady at 50-60 kcfs with this operation in effect. It’s the 30% operation combined with

switching from a one-unit to a two-unit operation at Little Goose that triggers navigation problems at Lower Granite. The COE doesn't plan to go to a MOP+1-2 operation unless there are further problems at the Lower Granite sill.

The Little Goose pool reached a threshold of 634 feet at 6:00 pm on April 6. The project never went to a fixed spill operation and remained at 30% throughout, Adams reported. This issue will not need TMT's attention again until probably July or August.

7. April Spring Creek Hatchery Release

On April 13, Spring Creek Hatchery will release the April batch of fish, Dave Wills reported. As specified in the Water Management Plan and the Fish Operations Plan, TMT considered operating the Bonneville turbines differently for a few days to accommodate these fish. The desired operation for the turbines is at the low end of 1% efficiency, with higher priority given to generation at the 2nd powerhouse. Last year, the Bonneville 2nd powerhouse units operated at the lower end of the lower quarter, with flows greater than the capacity of Powerhouse 2 being shifted to the 1st powerhouse, Feil said. If flows increased to the point where spill would begin to exceed the gas cap, flows through the 2nd powerhouse units would be raised higher than the lower quarter of the 1% peak efficiency range.

Wills estimated that flows this year will amount to 50 kcfs through the 1st powerhouse. He asked that Dean Ballinger (Pacific States) notify USFWS when the fish arrive so USFWS can monitor passage for 3-4 days after that.

The goal is to maintain the above operation until 90% of fish have passed, as long as the operation doesn't impact test schedules at the project. USFWS and the COE will coordinate this operation. Feil will email the teletype of last year's operation to TMT members. TMT will revisit this issue on April 22, at which time it may also discuss the Bonneville operation for the May release.

8. Operations Review

a. Reservoirs. Libby is at elevation 2,402.9 feet, with outflows of 4.0 kcfs and inflows of 2.5-3.5 kcfs.

Albeni Falls is at elevation 2,052.04 feet at the Hope gage. Inflows yesterday were 16.5 kcfs and outflows 16.1 kcfs, so the project is in slow refill mode. The end of April elevation target will be in the range of 2,054-6 feet.

Hungry Horse is at elevation 3,508.48 feet, discharging 1.8 kcfs and passing inflows at present. However, inflows are starting to increase and runoff is expected soon.

Seven-day average inflows are 60.7 kcfs at Lower Granite, 143.8 kcfs at McNary, and 162.2 kcfs at Bonneville. Spill will begin on the Columbia River projects on 1 minute after midnight on April 10.

Dworshak, discussed above under agenda item 4, is currently at elevation 1,532.3. Outflows have been 14 kcfs, which will increase as much as possible without exceeding 110% TDG.

Grand Coulee, discussed above under agenda item 4, is at elevation 1,281.4 feet and will start drafting toward an April 30 elevation of 1,256-8 feet.

b. Fish. Juveniles – Yearling Chinook index numbers are 1-2,000 per day at most traps, Wagner reported. Most of the passage is at Lower Granite, 5-6,000 fish per day. At Little Goose, a few hundred fish are passing per day. Passage in the lower river is not in full swing yet, with a few hundred per day at both Lower Monumental and Bonneville. Steelhead passage is slower to begin than yearling Chinook passage, with counts of less than 100 per day at most traps, and 1,000 per day at Lower Granite.

Adults – April 6 marked passage of the first 100 spring Chinook at Bonneville, which is similar to the past few years. In terms of the 10-year average, however, there should be a few thousand adults passing per day at this time. Recent years have been unlike the past 10 years in terms of averages, with a tendency for migration season to start later. The reason for that is unclear; it could be the result of lower river temperatures or plentiful ocean food supplies.

c. Power System. There was nothing to report today. BPA anticipates no problems with the initiation of spill on April 10.

d. Water Quality. Total dissolved gas levels on the lower Snake River have generally been low recently. Spill started at 20 kcfs at Lower Granite and will continue, with tailwater values of 108-109% TDG, and the highest reading at 109.7%. The Lower Monumental forebay has a relatively low TDG level of 113.6%, so on April 6 the spill cap at Lower Monumental was increased from 27 to 32 kcfs. The results are: TDG levels of 116.6% in the Ice Harbor forebay, and recently up to 117.7%. As a result, the spill cap was reduced back to 27 kcfs. The spill cap at 27 kcfs might need to be lowered again, due to TDG levels at the Ice Harbor forebay.

When flows went to 32 kcfs at Lower Monumental, the TDG tailwater values went down, Kiefer noted. A modified bulk spill pattern was used there prior to initiation of the TSW spill test. When the test begins, the spill pattern will alternate between flat spill and modified bulk spill, Adams said. Because of varied spill patterns, there isn't a direct correlation between spill quantities and TDG levels. This phenomenon is also prominent at John Day.

9. Next Meeting

The next regular TMT meetings will be April 22 and May 6, 2009. The April 22 agenda will include an update on Hanford Reach protection flows, more discussion of Dworshak and Grand Coulee operations, an update on The Dalles spill wall construction, Bonneville operations for Spring Creek Hatchery's April and May releases, and the standard operations review. This summary prepared by consultant and writer Pat Vivian.

Name	Affiliation
Jim Adams	COE
Paul Wagner	NOAA
Tony Norris	BPA
David Wills	USFWS
John Roache	BOR
Tim Heizenrader	Centaurus
Holli Krebs	JP Morgan
Eric Nilsson	BPA
Stephan Hall	COE
Russ George	WMC
Rick Kruger	Oregon

Phone:

XX	Seattle City Light
Joel Fenolio	COE Seattle
Kyle Dittmer	CRITFC
Chuck Oligosky	Cell Energy North America
John Hart	EWEB
Margaret Filardo	FPC
Rob Hollerman	Deutsch Bank
Barry Espenson	CBB
Russ Kiefer	Idaho
Ruth Burris	PGE
Tom Le	Puget Sound Energy
Bob Diaz	Integral Renewables
Kyle Charles	JP Morgan
Richelle Beck	DRA
Dan Feil	COE
Tom Lorz	CRITFC
Cathy Hlebechuk	COE