

**TECHNICAL MANAGEMENT TEAM
MEETING NOTES
October 3, 2001
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE
PORTLAND, OREGON**

TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>

FACILITATOR'S NOTES ON FUTURE ACTIONS

Facilitator: Richard Forester

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.

IT Preparation Discussion:

Cindy Henriksen led the discussion and presented information regarding operation questions sent to TMT to present at tomorrow's IT meeting. The presentation can be found on the TMT web page. Chris Ross also reported on fish status from last year, concluding that survival was low and runs were late. Cindy also presented actual temperatures and those modeled in the Mass 1 runs throughout the year. She pointed out that the models were not meant to be predictors.

Water Year 2001 Weather Review:

Kyle Martin circulated his power point presentation to the group. He reported on the low precipitation year, the sunspot cycle, run-off at Lower Granite, Priest Rapids, and the Dalles, and his prediction of next year's water year. All information from this presentation can be found on the TMT web page.

Chum Studies:

Cindy handed out four chum scenarios, as requested by TMT members. She said that, while there may be glitches in the scenarios, the COE is looking at Alternative 3 for this year. This operation would involve 125 kcfs out of Bonneville from November through April 1st. CRITFC also agreed with Alternative 3. Cindy again noted that these scenarios are not predictive, but theoretical in their objective. [Editor's note: The following was sent from Cindy Henriksen to TMT members on October 4, 2001:

In the notes regarding the chum studies it says that the Corps was looking at alternative 3 for this year. I'd like to clarify that the Corps was looking at alternative 3 for the *base case modeling scenario* for this year. The Corps is not suggesting that this is a recommended operation for this year, or a minimum operation for this year. We at the Corps had considered beginning to explore modeling chum operations, alternative 3 was the first scenario that came to mind and we had been looking at modeling that scenario before we had received other alternatives from the salmon managers.

So when I said we were looking at Alternative 3, this was in the context of a potential scenario to be modeled, not an operation.]

Action: TMT members were asked to look at the scenarios presented, provide feedback to Cindy and, by next Wednesday, offer any other scenarios they would like the COE to run.

Attorneys Meeting Update:

The attorneys have not yet met to discuss language from the TMT emergency protocols. Legislative comments from Paul Wagner were forwarded to the attorneys and will be posted on the web page later today.

CRITFC SOR 2001-10:

Kyle Martin reported that this is the last week of the tribal fishery, with fewer fishers than the previous weeks and by permit only. On behalf of the COE, Cindy thanked CRITFC for notifying the COE of their fishery plans in advance.

Lower Granite Spillway Weir Test:

Tim Wik joined TMT and explained a request for spill this Friday for the weir test, which could mean zero nighttime flows some time next week. Also, November 5-9 testing at the Lower Granite spillway may require spill through bay 1 or bay 2, depending on in-flows for that week.

Action: Cindy will ask FPOM to review potential operations and make recommendations to TMT. Members will discuss this further at the next TMT face-to-face meeting.

End of Power Emergency:

Robyn McKay read a memo explaining the end of BPA's power emergency, which went in to effect today. All reliability criteria have been met and the power system is currently stable. A copy of the memo will be sent out to TMT members later today.

Next Face-to-Face Meeting, October 17th 9-12:

Agenda items:

- Chum Studies
- Update on Lower Granite Spillway Weir Test
- Attorneys Meeting Update (TMT Emergency Protocols)
- Year-end Review

1. Greeting and Introductions

The October 3 Technical Management Team meeting, held at the Customs House in Portland, Oregon, was chaired by Cindy Henriksen of the Corps and facilitated by Richard Forester. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

Forester welcomed everyone to the meeting, then led a round of introductions and a review of the agenda.

2. IT Preparation Discussions.

Henriksen reminded the group that the IT had provided a list of five questions they wanted the TMT to answer in its year-end review, to be presented to the IT at tomorrow’s meeting. Henriksen distributed a handout showing the five questions and their answers:

1. How much water was provided over 125 Kcfs? How much additional reservoir storage did we release for the chum/power operation?

Total volume released above 125 Kcfs at Bonneville Dam from November 1, 2000 through March 15, 2001 was more than 1,205 ksfd. At individual headwater projects, the total flow released above minimum outflow prior to April 10 was 17.1 feet at Libby, 4.7 feet at Hungry Horse and 12.8 feet at Dworshak.

2. Without chum/power system flow constraints, could we have achieved upper rule curve elevations on April 10?

Yes, Grand Coulee could have achieved upper rule curve; however, the other headwater storage projects would not have reached upper rule curve. The table below summarizes the results of project operations at Libby, Hungry Horse, Grand Coulee and Dworshak with no increases made for power needs or chum flows:

Project	10 April refill target	Forecast 10 April Elev without chum or power operations (ft)	Difference below 10 April refill target w/o chum or power ops (ft)	Actual April 10 elevation (ft)	June 30 elevation with only minimum flow
Grand Coulee	1283.3	1283.3	0	1220.2	1290.0 Act: 1280.9
Libby	2448.0	2403.8	44.2	2386.7	2443.7 Act: 2431.1
Hungry Horse	3556.7	3494.4	62.3	3489.7	3544.6 Act: 3541.3
Dworshak	1592.2	1529.5	62.7	1516.7	1597.0 Act: 1587.4

The decrease in outflow from upstream storage projects would have resulted in flows at Bonneville that were generally lower than what actually occurred. The following chart graphs the actual 2001 Bonneville flow versus the adjusted flow assuming no power or chum operation at Grand Coulee, Libby, Hungry Horse or Dworshak for the period October 2000-April 2001:

[graph included here]

3. How far below flood control were the projects on April 10? How far from full on June 30? What were the average seasonal flows at Priest Rapids, Lower Granite and McNary?

See graphs on the TMT web page at <http://www.nwd-wc.usace.army.mil/TMT/index.html> under the 2001 Year-End Review Plots.

4. What was the timing of the fish runs in 2001? How did this compare to other years?

See graphs on the DART web page at <http://www.cqs.washington.edu/dart/esa.html>

In 2001, system survival for in-river yearling chinook migrants from Lower Granite to the Bonneville tailrace is estimated at 23%, about half the average system survival since 1995. For juvenile steelhead migrating in-river, an estimated 2.4% survived from Lower Granite to the Bonneville tailrace. PIT-tag detections were generally lower than normal in 2001. Passage timing of wild Snake River spring yearling chinook and steelhead at McNary Dam was later in 2001 than in 2000 (two to three weeks); few upper Columbia steelhead were detected in 2001 compared to 2000.

5. Water temperatures at Lower Granite and McNary.

See graphs on the TMT web page at <http://www.nwd-wc.usace.army.mil/TMT/index.html> under the 2001 Year-End Review Plots.

Henriksen said she will be making the presentation at tomorrow's IT meeting; she added that the TMT will have an opportunity for a more in-depth year-end review and lessons learned discussion at its all-day meeting on October 31. She then spent a few minutes going through the flow, elevation and water temperature information she will be presenting to IT. Henriksen said that as everyone is painfully aware, flows were very low in 2001; the average flow during the flow augmentation period at Priest Rapids Dam was 76.7 Kcfs, far below the objective of 135 Kcfs. At Lower Granite, spring seasonal average flow was 47.5 Kcfs, compared to a flow objective of 85 Kcfs; the summer average flow was 25.4 Kcfs, compared to the BiOp target of 50 Kcfs. Snake River flows peaked at 91 Kcfs on June 16. At McNary, the spring seasonal average flow was 123.1 Kcfs, compared to a BiOp flow objective of 220 Kcfs; the summer average flow was 90 Kcfs, less than half of the 200 Kcfs flow target. Lower Columbia flows peaked at 166.3 Kcfs on June 12.

Chris Ross then went through some of the 2001 biological data he will be presenting to the IT, noting that, in 2001, system survival for in-river yearling chinook migrants from Lower Granite to the Bonneville tailrace was 23%, about half the average system survival since 1995. For juvenile steelhead migrating in-river, the survival story is even grimmer; based on preliminary estimates, only about 4% of the 2001 juvenile steelhead migrants survived from the tailrace of Lower Granite to Bonneville. Ross noted that PIT-tag detections for all species at

most dams were much lower in 2001 than in recent years; he also touched on run timing information, by species.

3. Water Year 2001 Weather Review.

Kyle Martin provided a briefing on Water Year 2001 Weather, as well as recommendations for the 2002 water year. Martin noted that his report is based on data provided by the National Weather Service and the Northwest River Forecast Center. He said precipitation was near-normal to well above-normal at the start of the weather year in October 2000; the conventional long-range forecasting tools suggested a near-normal autumn and early winter.

However, precipitation in the Columbia Basin (as measured at The Dalles) was only 49% of normal in November and 57% of normal during December, Martin said. Mean basinwide temperatures were also colder than normal, with departures of -4.3 and -1.3 degrees F. This was particularly important because November and December are normally the two wettest months of the year, said Martin, and precipitation decreases dramatically after January.

He noted that CRITFC first alerted the region to the probability of a serious drought at the January 10, 2001 TMT meeting. Based on an analysis which correlates peak sunspot activity with the onset of El Niño events, CRITFC recommended that project outflows be immediately reduced to the greatest extent possible, and that water in the upper basin storage reservoirs be conserved for spring and summer migrants. The TMT, said Martin, chose not to act on CRITFC's recommendation, instead releasing upper basin storage for power and chum flows.

Dry conditions persisted through March 2001, Martin continued. There was also record-breaking warm weather in early January, with some west side locales experiencing temperatures in excess of 70 degrees F. This was offset by cold snaps in late January and mid-February. The region finally began receiving some precipitation in March, said Martin; precipitation totals in January, February and March 2001 were 40%, 51% and 82% of normal, respectively. The weather continued quite wet through the first ten days of April, Martin said; there was also heavy precipitation during the last 10 days of the month. Temperatures were extremely unsettled, with many record-breaking high and low daily temperatures recorded. For the month, precipitation for the Columbia Basin at The Dalles was 117% of normal.

Martin noted that the heavy rains of late April and early May triggered the juvenile migration, with the first pulse of chinook and steelhead smolts reaching Lower Granite in late April. By May, however, warm, dry conditions returned to the Northwest; Columbia Basin precipitation at The Dalles was 62% of normal in May, while mean basinwide temperature departures were +2.0 degrees F.

Cool weather and near-normal precipitation returned in June and July, with precipitation totals for those two months of 99% and 103%, respectively. Mean basinwide temperature departures were -2.2 and -0.6 degrees F, respectively. During August and September, however, the weather was once again warm, sunny and dry; precipitation totaled 32% of normal in August and 50% of normal in September. Mean basinwide temperature departures were +2.5 degrees F

in August and +2.6 degrees F in September. The cumulative precipitation total for Water Year 2001 for Columbia at The Dalles was only 68% of normal, Martin said.

In summary, he continued, Water Year 2001 started out near normal, then quickly deteriorated to persistent drought, producing the lowest flow volume water year in recorded history. He added that the federal action agencies operated the river primarily for power over fish in 2001.

Martin noted that the preliminary cumulative seasonal precipitation total of 15.8 inches for the Columbia at The Dalles was a new record low. Of greater significance was something that was largely ignored by the media, Martin said – the extreme number of daily high and low temperatures recorded in 2001. This is more evidence of global warming and a shifting climate, he said.

Martin said CRITFC is now forecasting 80%-90% of normal precipitation in Water Year 2002. He added, however, that the sunspot cycle model predicts that El Niño will peak in September 2002. The NOAA-NCEP sea-surface temperature departure forecast maps suggest that the tropical ocean will shift to El Niño by July 2002. In CRITFC's view, said Martin, Northwest water managers need to avoid the problems of Water Year 2001 and store as much water as possible during the winter of 2001/2002 to help 2002 salmon migrants and to provide a buffer against a 2002 El Niño event. In particular, he said, we would recommend that flood control operations be modified to allow for additional upper basin storage.

Henriksen took issue with Martin's suggestion that CRITFC's water conservation recommendations were ignored in 2001; she noted that the Corps began modeling a 1977-type water year as early as January 2001, and initiated a discussion of what might happen in such a low water year at a joint TMT/IT meeting on February 8, 2001. Henriksen noted the Corps took this direction after coordination with the River Forecast Center. The RFC has specific procedures to follow in development of their forecasts, but they were very responsive to the regional requests for contingency forecasts, Henriksen said.

4. Chum Studies.

Henriksen distributed a series of handouts showing the four chum operation modeling scenarios run to date, as well as the results of those runs. The four scenarios include the following:

- **Scenario 1:** Instantaneous flow of 130 Kcfs at Bonneville Dam from October 1-15, 140 Kcfs from October 16-31, 145 Kcfs from November 1-14, 150 Kcfs from November 15-30, 160 Kcfs during December and 150 Kcfs incubation flow from January 1 through April 10.
- **Scenario 2:** Instantaneous flow of 145 Kcfs at Bonneville Dam from November 1-14, 150 Kcfs from November 15-30, 160 Kcfs during December, 150 Kcfs incubation flow

from January 1-April 10.

- **Scenario 3:** Instantaneous flow of 125 Kcfs at Bonneville Dam from November 1, 2001 through April 10, 2002.
- **Scenario 4:** Determine the instantaneous flow level at Bonneville Dam for the time period from November 1, 2001 through April 10, 2002, that will result in meeting the upper rule curve flood control elevations for all FCRPS storage reservoirs on April 10.

Henriksen then provided a one-page summary of the results of each of these model runs, in terms of the number of years in the 50-year historic record the target flows could be met, monthly average Grand Coulee elevations and the number of water years in which the Grand Coulee flood control elevation targets would be met. She also provided a sheaf of more detailed model results for each of these parameters. Henriksen noted that all of this information is available via the TMT's Internet homepage.

Initially, Henriksen said, the Corps was thinking in terms of Scenario 3 as the starting-point for this year's chum scenario modeling; basically, what these runs tell us is that the flat 125 Kcfs flow at Bonneville would likely be an achievable objective in November and December. However, there could be a potential decision-point come January or February, Henriksen said – by that time, the model runs begin to show a decreased number of water years in which that target could be met. To me, she said, the message is that, once you start the chum flow this year, you need to keep in mind the strong potential for a decision-point in January or February. Martin said CRITFC would support Alternative 3.

The group devoted a few minutes of discussion to the assumptions (starting elevation, annual precipitation etc.) driving these model runs; Henriksen explained that the starting elevations used are the current project elevations, and that the model runs are based on the 60-year record. Given what we heard from Kyle today, she said, it may make sense to choose some normal and near-normal water years on which to base some additional model runs. Basically, this is food for thought, Henriksen said; the Corps, for one, is still thinking about what it means.

5. Attorneys Meeting (Regarding TMT Emergency Protocols) Update.

Henriksen said the attorneys for the action agencies and the states have not yet met to resolve the disagreement over the wording (offset v. mitigation) in the TMT Emergency Procedures appendix; the date of that meeting is still up in the air. Once it occurs, she said, we will inform the TMT of the outcome.

6. CRITFC SOR 2001 C-10.

On September 25, the action agencies received SOR 2001 C-10. This CRITFC SOR, which concerned Week 4 of the fall treaty fishery, requested the following specific operations:

For the period 6 a.m. September 27 through 6 p.m. September 29:

- Bonneville Pool: Operate pool within one foot from full pool (msl elevation 77-76)
- The Dalles Pool: Operate the pool within one foot (from msl elevation 159.5-158.5)
- John Day Pool: Operate the pool within one foot (from msl elevation 264.5-263.5)

Martin went briefly through the specifics of this SOR, which has already been implemented. Henriksen said that, in response to this SOR, the Corps maintained Bonneville within a 1.5-foot operating range at elevation 75.0 to 76.5 feet.

7. Lower Granite Spillway Weir Test.

Tim Wick said the Corps is requesting two to three hours of Spill Bay 1 operation this Friday at Lower Granite, to give project personnel an opportunity to check some of the RSW operations that were not checked during the September 11 test. That would be two hours of approximately 9 Kcfs-10 Kcfs spill at Lower Granite, said Wick.

Henriksen noted that Lower Granite is currently operating Unit 5, due to transformer work on Units 1 and 2; the minimum flow through Unit 5 is 13.5 Kcfs. With Snake River flows receding, Henriksen said, maintaining that minimum powerhouse flow plus 9 Kcfs-10 Kcfs of spill will mean that we have to draft Lower Granite pool, probably by about two to three tenths of a foot. This is a concern, Henriksen said, because the pool elevation at Lower Granite is continuing to erode; the more it recedes, the closer we come to the possibility of zero nighttime flow at Lower Granite, Little Goose and Lower Monumental.

Wick noted that a balloon-tag test of the Lower Granite RSW is currently scheduled for November 5-9, starting on Monday, November 5, about noon. What we need to do for that test is periodically open Spill Bays 1 and 2 to release the balloon-tag fish, Wick said. We need to open Bay 1 nine times daily, for about half an hour each time, on Tuesday through Friday; we need to open Bay 2 three times per day, for about 20-30 minutes each time. In other words, he said, for those four days, we would need to spill for a total of 4.5-5 hours each day through either Bay 1 or Bay 2. On Monday, we would probably only need to spill for about two hours in the afternoon, said Wick.

The key question is inflow during that week, Henriksen said – if inflows are in the 16 Kcfs range, we'll be OK; if they're only 13 Kcfs, that's going to be a challenge. At that point, she said, we would need to talk about shortening or delaying the test, going to a period of zero flow in order to recharge the pool or some other option. It may make sense to ask FPOM discuss this topic, Henriksen suggested; there was general TMT agreement that this would be a good idea.

8. End of Power System Emergency.

Robyn MacKay said the ongoing power system emergency has now officially ended, with the achievement of the September 30 financial and system storage criteria laid out last March.

9. Next TMT Meeting Date.

The next meeting of the Technical Management Team was set for Wednesday, October 17 from 9 a.m. to noon. Meeting notes prepared by Jeff Kuechle, BPA writer-editor pool.

TMT PARTICIPANT LIST

OCTOBER 3, 2001

Name	Affiliation
Greg Bowers	COE
Ron Boyce	ODFW
Ruth Burris	PGE
Suzanne Cooper	BPA
Margaret Filardo	FPC
Russ George	Water Management Consultants Inc.
Richelle Harding	D. Rohr & Associates
Robin Harkless	Facilitation Team
Cindy Henriksen	COE
Karl Kanbergs	COE
Robyn MacKay	BPA
Kyle Martin	CRITFC
Tony Norris	USBR
Mike O'Bryant	Columbia Basin Bulletin
John Oh	Enron
Chris Ross	NMFS
Shane Scott	WDFW
Maria Van Houten	Enron
Paul Wagner	NMFS

Steve Wallace	PacifiCorp
David Wills	USFWS