COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
August 7, 2024
Facilitator's Summary
Facilitation Team: Emily Stranz & 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; it is not intended to be the "record" of the meeting. Official minutes can be found on the TMT website: https://pweb.crohms.org/tmt/agendas/2024/ Suggested edits for the summary are welcome and can be sent to Colby at colby@dsconsult.co.

Review Meeting Summaries & Minutes – TMT Members approved the official meeting minutes from the July 24 meeting, and the minutes and facilitator's summary from July 31.

Dworshak Operations – Willow Walker, Corps, reported on operations at Dworshak Dam (DWR), updates are posted to the TMT website. To begin, local temperatures in Lewiston, Idaho, were overwhelmingly above average for July, and have been mostly above average for the start of August.

DWR is currently releasing 9.5 kcfs (within powerhouse capacity) and will be coming up this evening to add about 1,000 cfs of spill in preparation for Lower Granite Doble testing. Forebay elevation is 1,565 feet, about 2.5 feet above project levels at this time last year, which Willow noted was in part due to raising the Lower Granite (LWG) tailwater temperature criteria to 69.5 degrees F. Temperatures at Anatone and Orofino are in the mid-to-upper 70s, with no peaks into the 80s for the past couple of weeks. The LWG tailwater is at 68.5 degrees F. So far throughout the August 1-9 period of relaxed LWG tailwater temperature criteria, the highest observed temperature has been 69.1 degrees F.

Stratification in the LWG forebay has pushed a bit deeper to the 25-meter mark due to the LWG temperature relaxation. The project has been spilling via the RSW-only as of August 1, which pulls from a shallower depth; stratification will push back up to the 15-20-meter mark after the LWG tailwater criteria returns to at or below 68 degrees F after August 9.

Forecasted inflows into DWR have not changed from past months and remain slightly below average for the summer. Regional temperatures in the 10-day forecast are in the 90s, and there is potential for light precipitation and cloud cover within the forecast, which would help protect the top of the pools from solar radiation. Temperatures in Lewiston are still forecasted to be in the 90s and upper 80s, with nighttime temperatures lowering to the 60s which will provide relief from the heat.

Modeling results from yesterday continue to reflect the change in temperature operations at LWG. With lower forecasted regional temperatures, Anatone and Orofino are expected to cool. At the end of the relaxed criteria period, operations will work to bring the LWG tailrace back down to 68 degrees F or below. As noted, DWR has started ramping up flows and added spill today to prepare extra cool water for LWG Doble testing and plans to run at 11 kcfs for a few days. Towards the end of testing, DWR flows will be closer to 9 kcfs. Willow noted that the spike in the model around August 12 reflects the change in spill for Doble testing and won't be as sharp in real time.

Finally, Willow reviewed the alternative operation at DWR from August 1-9 to save as much water as possible for the remaining summer timeframe. So far, the operation has achieved its goal of saving enough water to get through the end of August with the LWG tailwater at 68 degrees F, accounting for the additional heat through the end of the month. She clarified that three days of cold water are being used for Doble testing; the additional water saved via the alternative operation will be used through the remainder of August.

Little Goose Dam (LGS) - Minimum Operating Pool – Kelsey Swieca, NOAA, reported on the extensive conversations between Salmon Managers and Action Agencies regarding the dynamics of the LWG tailwater gauges, readings, and the project's minimum tailwater elevation requirement. On August 1, the project transitioned to an RSW-only spill with operations running smoothly until the morning of August 5 when the LWG tailwater dipped below the minimum elevation requirement for 4 non-consecutive hours *[Facilitator's Note: this was corrected later by Eric Chow, Corps, to 5 non-consecutive hours]*. This triggered the Corps to issue a LGS forebay adjustment from the previous 0.5-foot raised MOP to a full 1-foot raised MOP to meet the minimum tailwater requirement at LWG.

As sufficient depth has been maintained at the navigation lock (minimum of 633 feet) throughout this period of time, Salmon Managers raised concerns for adjusting the LGS to a 1-foot raised MOP. They are trying to better understand the mechanisms contributing to the tailwater conditions and asked for information from the AAs on why the change occurred August 5. The group discussed in depth the dynamics of the LWG tailwater, power reliability and forebay operating range, and the need for balancing power generation with fish protection measures. Tony Norris, BPA, noted that these conditions are common at LGS and LWG in low flow years and that BPA operators are consulting data at a finer timescale than what is publicly available.

AAs explained that they were monitoring the situation closely and would consider adjustments to the MOP range when possible, however, they are currently seeing readings of more than 1-foot difference between LGS forebay and LWG tailwater elevations. Julie Ammann, Corps, proposed a potential 0.7-foot raised MOP as an alternative to the full foot raised MOP, noting that her team will try the operation and watch closely to see how the river responds. The topic will be revisited as needed. Additionally, there was discussion of a possible tour in the near future of the BPA control center in Vancouver to better understand real-time operations, BPA will look into this. Facilitator, Emily Stranz, commended TMT members for their contributions to the conversation, noting that the group was clearly seeking to understand each other's perspectives and addressed the issue in a respectful manner.

- **ACTION**: The Corps will shift to a 0.7-foot raised MOP at LGS and monitor to see how the LGS pool and LWG tailwater reacts.

Finally, regarding Doble testing at LGS, Washington Ecology requested that water quality agencies be consulted prior to rescheduling to ensure compliance with temperature criteria.

- **ACTION**: The Corps responded that the states did have the opportunity to provide input on the Doble testing and will follow up with WDOE regarding the process to weigh in on the maintenance schedule.

Questions and Comments from Members of the Public: There were no questions or comments from members of the public.

The next scheduled TMT meeting is on August 14, 2024, at 9:00 AM.

Columbia River Regional Forum
Technical Management Team
OFFICIAL MINUTES
Wednesday, August 7, 2024
Minutes: Andrea Ausmus, BPA (contractor, CorSource Technology Group)

Today's TMT meeting was held via conference call and webinar, chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. A list of today's attendees is available at the end of these minutes.

1. **Review Summaries and Minutes**

   a. July 24 Minutes

      - Minutes – Approved

   b. July 31 Summary and Minutes

      - Summary and Minutes – Approved

2. **Dworshak (DWR) Temperature Augmentation Update –** *Willow Walker, Corps-NWW*

   a. NOAA NWS Climate Data – Lewiston, ID

      - July: 21 out of 31 days above normal temperature range
        - 19 days were consecutive
        - Several record setting days
      - There was a short reprieve from the heat at the end of July into August allowing for some relief in the system.
      - August: 5 out of 7 days above normal temperature range
        - One record setting day.

   b. Dworshak Dam Current Hourly Data

      - Releasing: 9.5 kcfs
        - Within the powerhouse capacity
        - Adding 1 kcfs in preparation for Lower Granite Doble testing next week.
      - Forebay Elevation: 1565 feet
        - 2.5 feet more water than this time last year.

   c. Snake and Clearwater Rivers Temperature Data

      - Anatone (Snake River):
        - Temperature: ~73°F

- Orofino (Clearwater Mainstem):
  - Temperature: ~74°F
- Anatone and Orofino have continued to be in the mid- to upper-70s.
  - There have not been any peaks into the 80s as was seen recently.
- Lower Granite Tailwater:
  - Temperature: 68.5°F
  - August 1 – 9 Criteria: 69.5°F
  - Highest criteria period temperature: 69.1°F

d. Lower Granite Forebay Temperature String

- The 15/20m mark is where typical mixing would occur, the depth that the outlets would mix the water at to give an estimate of what would be seen in the tailwater.
- Since August 1 – LWG spill has been through the RSW only, per the FOP.
  - The RSW spills from a shallower depth.
- 15/20m mark does not give an accurate estimate of what is in the tailwater right now.
- Forebay temperature string does give a representation of the stratification, which has pushed deeper to the 25m mark.
  - This was intentional because of the relaxed temperature criteria coordinated by TMT.
  - The stratification was maintained, and it will be pushed back up in preparation for the end of the relaxed criteria period on August 9.

e. Dworshak Extended Inflow Forecast

- No change to the inflow trend.
- Inflows are still forecasted to be below average for the rest of the Summer.

f. 10-Day Regional Forecast (Aug 8 - 17)

- Forecasts show it being warm, but there are no temperatures forecasted to be >100°F.
- There is a potential for light precipitation and possible cloud cover to protect the top of the pools from solar radiation.

g. Weather Forecast for Lewiston, ID

- Temperatures are forecasted to be in the upper 80s and 90s; but not 100s.
- Nighttime temperatures are forecasted in the 60s.
  - The last couple heatwaves had nighttime temperatures in the 70s.

- Having the low temperatures forecasted in the 60s would allow for some relief to the water overnight.

h. Temperature Model Run Results – Updated August 6 @ 8:15am

- Having cooler forecasted temperatures in the region, NWW expects Orofino and Anatone temperatures to be decreasing.
- Through the period of **August 9**, NWW will continue to operate per the relaxed criterion of 69.5°F.
- At the end of that period, they plan to bring it back down to 68°F or below.
- DWR started ramping up flows on **August 6** and will continue a little into today in preparation for LWG Doble testing to be able to keep LWG tailwater at its normal 68° or below.
  - NWW plans to run 11 kcfs for a few days, once they see the end of the LWG Doble testing they will bring DWR flows back down to 9 kcfs.
- **August 12** marks the change to less generation and more spill for LWG Doble testing. In the model the change appears to have a spike in temperature, in real-time it will not be as sharp but there will be a spike in temperature around then which is why they are sending the extra water now in preparation for that period.

i. DWR Water Supply Outlook

- The Corps recognizes that this is a tradeoff and not 100% ideal but Walker reported that it has achieved the goal of giving us enough water to get through the end of August with the tailwater at 68°F. It will allow us to get through Doble testing and one more heatwave this summer, which was the initial goal of getting that extra water.

| *from Charles Morrill to everyone: 9:09 AM*

| *the 2.5 ft above last year ... a result of allowing temps to rise to 69. 5 ?*

Walker said yes, before we had the relaxed temperature operation we were tracking much more closely to where we were last year. At least two feet of this additional water was because we were able to bring DWR releases down to 7.5 kcfs for this modified operation.

Charles Morrill, WA, asked if we would pick up another half foot or so in the last three days of the operation.

Walker said we will probably hold on to the 2.5-foot mark. She said we are currently right below 2.5 feet, at 2.3' or 2.4', so we would be coming in right around the 2.5-foot by the end of the operation.

Erick Van Dyke, OR, asked for some clarification. He asked if the 3 days extra that we had before TMT made the change was still there or if it had been used up.

Walker said that the 3 days before TMT made the change is still there. She said that NWW started using that right now in preparation for Doble testing. She said that we have

gained additional days that we can use in the second half of August in case there is a heatwave.

Van Dyke said that was helpful and thanked Walker.

3. **Little Goose Dam - Minimum Operating Pool** - *Kelsey Swieca, NOAA Fisheries, and Eric Chow, Corps-NWD*

   a. Introduction

   - Swieca said that for some time the Salmon Managers (SM) and Action Agencies (AA) have been engaged in an extensive conversation about the dynamics of the LWG tailwater gauges, the readings, and the Corps' minimum tailwater requirement at LWG dam.
   - Thursday, August 1
     - Transitioned to RSW only spill.
     - Running smooth for a few days and there were no tailwater elevation violations for that period of time.
   - Monday, August 5
     - LWG tailwater dipped a little below the minimum elevation requirement for four non-consecutive hours, triggering the Corps to issue a LGS forebay adjustment for a full 1-foot raised MOP *(note this was later corrected by Eric Chow, Corps, to five hourly readings)*.
     - LGS was previously at a 0.5-foot raised MOP.
     - The additional 0.5-foot raise to the 1-foot raised MOP was to make sure they were meeting the minimum tailwater requirement at LWG.
   - SM pointed out that they were able to maintain sufficient depths at the navigation lock the entire period and the navigation lock did not dip below 633.7 feet.
     - Navigation lock minimum: 633 feet.
   - SM requested more information about what might have changed on August 5 in what appeared be an okay operation to dip below the minimum tailwater elevation.
     - SM said that they understand that this is a complicated issue that has a lot of variables that affect the LWG tailwater gauge, so they are hoping to start a conversation about perspectives and flexibilities.

   b. Dataquery (LWG TW and LGS FB)

   - On the Dataquery the Corps looks at the difference between the LWG tailwater and LGS forebay elevations.
   - They were seeing the difference increase where the LGS forebay is > 1 foot higher than the LWG tailwater.
   - When this happens, they transition to 1-foot raised MOP.

   c. Snake River at Hells Canyon Dam

- USGS gauge shows the discharge out of the Hells Canyon Complex on the Snake River.

d. Dataquery (LWG Outflow and HCDI Flow)

- The Dataquery plots the USGS Hells Canyon Complex data along with the LWG outflow.

Tony Norris, BPA, explained that LWG is still operating within MOP. It is important that they not exceed MOP and when there is an increase in inflow, they need to increase outflow. They do that by increasing generation. Looking at the Hells Canyon Complex 30-day graph, the period between July 25 and August 1 we had cooler weather and so Idaho Power released less water during that period because power prices were lower, and demand was lower during that period. As soon as the hot weather came they immediately started increasing their load shaping each day. You can see the significant swings in outflow shown on the graph. Norris said that they need to operate LWG to maintain the Project with MOP. The need to move the water when it arrives.

Stranz asked if there was anything more from the Corps or BPA as to why that change was needed on August 5.

Norris said that prior to August 1, we were still struggling to keep above 633' on the LWG tailwater. He said that this is a well know artifact that happens in LGS pool during low flows. He said that the AA have discussed this at TMT for the last 25 years so this is no real surprise that this occurs. He said that they were approximately 1 foot above the 633' of LGS forebay and still having issues prior to August 1. He said that this happens during the low flow period every year.

Jay Hesse, Nez Perce, asked to look at that data. He said that he is understanding that it might be a lot of work to keep within the MOP range, but we were not dropping below that prior to August 5. He asked if Norris could talk a little more about power peaking.

Norris said that is because they do everything they can to avoid that, but at some point, they are not able to do it without a raised MOP at Little Goose. He said that is a typical operation in a year with low flows.

Swieca said thanked Chow and Norris for the information. She said what the SM are struggling to understand is what changed on August 5. From August 1 to early morning on August 5, we did not seem to have an issue, but then on August 5 we dipped below that minimum tailwater requirement. She said that the SM are trying to discern what happened differently on August 5 that may have been the mechanistic cause for the dip. When they look at the data it is not entirely clear so they are hoping to get the perspectives from the AA, e.g., the downward trend in the range of the LGS operating pool from August 3 to August 5, or something else that the SM do not have the data to discern for. She said that is what the SM are really trying to get at here, they are trying to understand the mechanism of the LWG tailwater issue and it has been quite difficult because there are a lot of issues at play, and as was mentioned, it is a highly dynamic system. Swieca said that they are looking to see if the AA can provide any context in what in particular may have caused that on August 5, and asked if there is anything we can do to ameliorate that.

- *from Charles Morrill to everyone: 9:29 AM*
- *https://pweb.crohms.org/dd/nwdp/project_hourly/webexec/rep?r=lwg&ago=2*

Julie Ammann, Corps, said in reference to the 30-day Hells Canyon graph, that there are a couple of pieces there that may explain this. She said that the Hells Canyon drop right after July 25, corresponded to some issues in the LWG tailwater. She said that was when the Corps implemented the alternative spill pattern which seemed to ameliorate some of the problems through the rest of the month. Then on August 1, the Corps had another change in operations where they went to RSW-only spill and they had the drops again from Hells Canyon on August 4. She said that she wondered if the combination of low, low inflows and corresponding tweak in operations that was made at LWG in order to manage for MOP may have made a compounding factor in that. She said that was something that was popping out on the graphs for her. She asked if Norris had more to add there.

Norris said on August 5 there was a LGS line outage on that day (he was not sure at this point why). He said that was certainly why they had issues that day, but leading up to that, they also had issues. The previous period before August 1, we had cooler weather and the outflow out of Hells Canyon was not quite as varied because of the cooler temperatures. He said that he was not sure what else to say here. He said that this is not unexpected every year when we have low flows in LGS pool.

Stranz said maybe not unexpected, but also complicated, so TMT is trying to tease apart all the different pieces for better understanding.

Hesse said that one of the complexities on August 5, was the operation at LGS. He said that his understanding was the operation was for an outage for repairs and was a speed no load operation. Hesse said looking at subsequent days of observations with the additional 0.5-foot raised MOP where LGS has been restored to normal operations, we were above the LWG tailrace minimum criteria by more than 6". He asked if the dip on August 5 was specifically influenced by the LGS operations towards the lower end of the operating range, and we could go back to the 0.5-foot raised MOP at this point given that the last two days have been more than 6" above the 0.5-foot raised MOP.

- *from Charles Morrill to everyone: 9:32 AM*
- *LWG project data for Monday July 5 ... 4 hourly readings below 633 in first 10 hours of operation*

Ammann said that she thought the decrease in the LGS pool would definitely impact tailwater elevation at LWG. She told Hesse that the challenge is that when the Corps has an operating range and then they utilize that range and it does not work anymore then they respond by raising that operating range. She said that it is a little challenging to say that they are going to lower the operating range, if they cannot actually utilize that operating range. Ammann said that she thinks that might be where part of the disconnect is on this operation. She said that she would let BPA respond to how much space they need. She said that the Corps has a 1.5-foot operating range of that project. They try to maintain within a 1-foot soft constraint range but she thinks limiting that operating range by only operating in the upper portion of a range is a problem.

> *from Charles Morrill to everyone: 9:34 AM*
>
> *I understood that the change was based on 4 consecutive hours below 633 ... is that correct ?*
>
> *from Eric Chow to everyone: 9:35 AM*
>
> *Yes, the change was based on 5 hourly readings (non-consecutive) below 633 on the morning of 7/5.*
>
> *from Charles Morrill to everyone: 9:36 AM*
>
> *real time variances much finer than 1 hour data shown in project data ?*

Norris said that it might be fine one day, but maybe not the next. He said that BPA works with RCC when Real-Time is having a hard time staying off the bottom. He said that RCC makes a decision based on the data that they have on whether or not they need to make a change. It is important for BPA to keep the lights on every second of the day, so what TMT does not see is that there are periods in a much finer time step that BPA needs to monitor and work around those real-time variances. What you might see from an instantaneous hourly data might not necessarily reflect everything that happens on the system. If it looks like BPA will continue to struggle to keep off of 633' then BPA will usually discuss that with RCC, then RCC will make an adjustment based on what they see. Norris said that it is typical for the low flow conditions to end up with at least a 0.5-foot to a 1-foot raised MOP for a LGS pool. This is no real surprise for this time of year.

Stranz said that Hesse mentioned that there were two days of the tailwater elevation being 0.5-foot above the minimum. She asked Norris if he could share anything about what he is seeing in terms of trends when looking at the data. She asked if they anticipated being able to shift back to a 0.5-foot raised MOP or if they are not there yet based on what they are seeing.

Norris said that is something that is evaluated every day by RCC and BPA Real Time as they are provided feedback on how operations are going in real-time. He said that he cannot necessarily tell TMT what the next several days are going to bring but that is something that they maintain as their slate of considerations as they move through the rest of this dry period.

Hesse said that it seems to him that the low tailrace elevations are associated with the minimum flows, the min-gen operation, and the RSW flow (~19 kcfs). He said that this is an operational choice in terms of the load following at LWG and it appears that when generation is higher than the min-gen level, that we are not right at or below the 633' threshold. Hesse said that this seems to be an operation that is implementing a power profile that requires relaxation of a fish criteria and that there is the opportunity to not be as aggressive in curtailing flows going to the min-gen level during the 24-hour period. He said that he thought that it would be consistent with the Commitments Document that we look to balance those things. He asked if there is an opportunity to not load follow quite as strongly and go down to the min-gen levels during this time frame and avoid relaxation of the MOP criteria even further.

Norris said that he had described earlier that they are passing those changes in inflow at LWG. He said that there is no choice unless we want to exceed MOP at LWG in moving that water. Norris said that we should be able to operate between min-gen (~13 kcfs) and then we add another unit (~26 kcfs) to pass the inflow when it arrives and they should be able to do that. When they are operating the LGS forebay almost a foot above 633' they are managing that inflow when it arrives. They should be able to do that when they are operating within the operating range.

- *from Ben Hausmann to everyone: 9:40 AM*
- *Can we have a definition of what Jay is referring to as "load following"? I don't see the LWG ops as load following by my definition.*

Hesse said that the flow fluctuations coming out of Hells Canyon Dam and coming downstream have been, as shown in the previous graphic, fairly static over the summer, including the July timeframe prior to August. He said during that timeframe the load following, or generation swings, at LWG were not occurring. He said yet we were still experiencing those same flow dynamics coming from the upstream. He said that he was not quite understanding the necessity just to meet inflow. He said that it seems like this is an intentional choice to load follow at LWG to a certain degree. Hesse said that he is wondering if that can be modified, SM are not asking for more spill, they are looking for ways that operations can be adjusted so that it does not require a curtailment or relaxation of fish operations.

Norris said prior to August 1, we had higher spill levels. They had a fixed spill level in July, the flow fluctuations were similar to earlier in July, but we had higher spill levels. Now with low spill levels that water passes through a turbine. Hesse said that the AA should be able to operate the project within MOP and they have made a concerted effort to avoid having to make adjustments to MOP by limiting their range. He said if they would look at how they have operated the forebay in previous periods and even earlier up in April. Norris said that he does not necessarily think that is necessarily is a power operation, they have to pass flow and now they have less spill so now the water is passing through a powerhouse.

Hesse said that he did not think that they were on the same page because he was looking at the outflow from LWG prior to August 1 (total spill and powerhouse) and it does not bounce up and down like it is now and we are still having the same flow fluctuations coming in from Hells Canyon.

Norris said that as he described, ~7 days prior to August 1 the inflow was quite a bit different. Prior to that, inflow was similar to what we are seeing now but at a higher level and we had higher spill levels so the powerhouse discharge was doing pretty much the same as it is doing now. If you look at powerhouse outflows in the early part of July to around July 24 it is not much different than what we are seeing now.

Hesse said that he would leave it with he thinks there are opportunities both in how the load following occurs to make adjustments that would allow the adjusted MOP to be pushed back to the 0.5-foot range, not the full MOP by not going down the min-gen level. He said that he thinks that there is the opportunity to go back to the 0.5-foot range now given that we are seeing tailrace conditions that exceed more than a 0.5-foot above the

minimum level. He said that he would leave it there and say that both accommodations would be more in line with the fish conditions that are desired.

Chow said that he would like to address Hesse's question about transitioning back to 0.5-foot raised MOP. He said that they are constantly watching this. They are looking for any opportunity to transition back to 0.5-foot raised MOP. He said that the main reason they do not want to transition back to 0.5-foot raised MOP is that they are still seeing more than 1 foot difference between the LGS forebay and the LWG tailwater. If they did transition and then they operated in the bottom end of the range they would be below the LWG tailwater. Chow said that is one of the main things they watch for, the difference between LGS forebay and LWG tailwater. When that reduces then they can look at transitioning back to 0.5-foot raised MOP.

Ben Hausmann, BPA, said that he was curious about Hesse's reference to load following. He said that he has not been in TMT forever, but he did work at a Project for a long time. He said that he felt like that definition from the Project perspective was a little different than what Hesse was describing so Hausmann was curious if he could get a better understanding of when someone says load following, what that means. He said that in looking at the LWG operations if they are holding a static tailwater and forebay (which they were even on August 5) and they have an increase in 15 kcfs or whatever coming from Hells Canyon. Hausmann asked if it is just that it is passing through the powerhouse and if they were in regular spill season, as opposed to spillway weir, it would not be considered low flow if they could bump up that 15 kcfs to pass via the spillway. He said that he was not sure whether the question made sense, but he is trying to understand the definition so when he hears what choice they are making what is the other choice.

Hesse said that load following or power peaking in his definition, is when generation is variable across the day and maximized during the hours when demand and market prices are high. Typically, that is the daytime and whether that is early morning and evening hours, or static throughout the day. The typical scenario involves some fluctuation in pool elevations in terms of drawing the pools down when you are maximizing the generation and raising those pool levels when generation is scaled back. He said that he thinks that is evident when you look at the forebay elevations at LWG during these time frames. It is a combination of variable inflows coming in from Hells Canyon, but it is also the utilization of LWG pool and the foot and a half operating range to match up that generation with demand levels. This would be load following and power peaking which would be market following. He said that there probably are more precise definitions but that is how he sees it.

Hausmann said that helps, and it does not veer that much from his understanding as well, but he said that he did not necessarily see that when he was looking specifically at August 5. He said that it did not look to him like it was a market following time frame just based on the times that we were seeing those peaks. He said that they happened to aligned perfectly with Hells Canyon outflow. He said that is where he was struggling with it because he did not see that in the data that is was advantageous from a power side as opposed to swinging the forebay by half a foot. He said that he does not get the reference about making a choice versus the fish protection measure. He said that he does not understand what the other choice is.

| *from Charles Morrill to everyone: 9:51 AM*

| *can we look at LWG tailwater vs LGS forebay intervals in finer time scales than one hour*

Hesse said he would make two points, that at the 1.5 foot pool range has the ability to absorb or manipulate the flow volumes going in and out and staying within the 1.5 foot range. When you shape that outflow, there is that ability to manipulate it to meet the high demand, the high market value periods. Hesse said that his second point is that he thinks that if TMT is going to continue the discussion about this just being reactionary and meeting inflow or outflow matching inflow and outflow numbers, we need to have a discussion about when those peaks and valleys of Hells Canyon flow actually reached LWG pool and influence the water volume at the dam itself. Looking at the gauges, and we have seen the gauges both at Hells Canyon and at Anatone. He said neither represent the timing of when those flow volumes actually hit the pool. He said that it would be helpful to him if that is the condition that BPA that is following that when the water hits the pool then generation goes up then he would like to see the actual data that show that data. He said that it is curious to him that the generation at all four Snake River dams tend to peak and valley and the same time and that would not be consistent with the Hells Canyon flow waves going down stream. Hesse said that it would be incredibly coincidental that that just happens to hit during the daytime hours every day at all four Projects.

Charles Morrill, WA, said that he had a couple of comments and he had posted them through the chat window. He said that there are two things that he would like to ask. He asked if the time scale for resolutions for fine scale operations is not accurately reflected in the data that is readily available to SM. He said that as Norris noted, the fine time scale of adjustments when dealing with the LWG tailwater and LGS forebay are much finer than a one-hour operational change. He asked if that was correct.

Norris said yes, it is a well known fact that the AA indeed monitor on a incredibly fine time scale because they are expected to maintain the criteria all the time.

Morrill said when they as SM, look at the Project data, there is a lot that does not show up in terms of the operational side, he said that he understands that. He said that the other question that he had with a data query can the SM look at the LWG tailwater versus LGS forebay in a finer time scale than an hourly basis. He said that he spent quite a bit of time looking at all the data from August 1 to August 7 and he struggled even with the explanations provided by Norris. He said that he understands what Norris was saying but he said that he is not sure that he is on the same page with the explanations. He asked if there is a finer scale resolution that the SM can look at the differences between LWG tailwater and LGS forebay elevations.

| *from Ben Hausmann to everyone: 9:55 AM*

| *Thanks for walking through that Jay. Using more of the LWG forebay range to mitigate is the alternative option" I was wondering if you were referencing.*

Norris said that he thought that the Corps had provided snapshots of some of that data in the past for specific operations. Norris said that data would not be available on a public database.

Morrill said the snapshot would be something that would be helpful for him in looking at the information because he concurs with a lot of what was said by Hesse. He said that he would appreciate being able to see something like that to help explain. Morrill said that when he looks at the data for August 5 and we are bouncing very close to 633' most of the day. He said that Norris explained his concerns and how they approached and made the decision to raise MOP, yet he cannot fit all of the pieces together very well.

Norris said to be clear, the AA should not be constrained to a 6-inch LGS forebay operating range to be able to maintain the system for power and fish. He said if we continue to lower the LGS forebay operating range it puts a constraint on the AA to operate in the top 6-inches of that range which makes it nearly impossible to operate the Project within that range and stay above 633' at the LWG tailwater which is why they continue to incrementally raise MOP. Norris said that the Corps does evaluate when there is a raised MOP condition, to determine when it can be lowered. Norris said that he thought the Corps is looking at that as TMT speaks. He said that gets evaluated on a daily, weekly basis to meet the constraints and obligations in the Agreement.

Stranz said that AA are not constrained to the half-foot but what TMT is hearing from the SM is that they would prefer if you can be in that lower side of the operating range.

Norris said if they lower the operating range then they are unable to keep the LWG tailwater from going below 633', that is why they have a raised MOP concern. He said that they do need to operate the system for power and if they are operating LGS forebay a foot above 633' it constrains. If they are hitting a 633' LWG tailwater and there are operating a foot above at LGS that only leaves 6" and that is not enough the operate the system.

Ammann said one thing that the Corps can try, is rather than doing a full 0.5-foot raised pool above where they were, she thinks they can raise it a few tenths. She said that we need to put operating ranges that BPA can access, and operations that the Corps feels are prudent and safe. She said that she thinks that they can propose attempting a 0.7-foot raised MOP. Ammann said that this is not an increment that has normally been done before but is something that she thinks we could try and the Corps will monitor the tailwater. She said that it would get us down a teeny bit, a few tenths of a foot, since we had a few tenths of a foot violation on August 5. She said this is an operation that we could test out and see if it works given the conditions that we have right now. Ammann said that she can propose that as a test to work around. She said that their team will be watching it and those differentials are a little worrisome so if the LGS pool goes into the lower end of that we may not be able to maintain but we can give it a shot and see how it goes.

Morrill said thank you.

Stranz said thank you for thinking about that and offering an alternative moving forward.

Eric Van Dyke, OR, said he appreciates Julie putting her brain in that space. He said that the reason we are talking about this is not because were not within, it was because we went below the range. He said that he was curious about two things. He said that Chow mentioned that he was watching the two elevations to see that they are roughly a foot apart. He asked Chow to confirm that he understood correctly.

Chow said yes, one foot.

Van Dyke said that they are really bouncing around but they are mostly around about a half a foot. He asked Chow if that fits his understanding of the information that is there.

Chow said that the latest readings, especially the tailwater, it is bouncing between a foot and a half-foot.

Van Dyke said during the period that we are talking about, and the management prior to running into the issue.

Stranz asked if Van Dyke meant August 4 and 5.

Van Dyke said if you start at July 31 until August 3, there are some oddities. He said that August 3 is about the time when we dropped into the last half foot of the actual range we have been using for MOP, 633 – 634.5'. He said that the operation is generally trying to hit the center of that with the notion that it will bounce around a bit. Van Dyke said that it was leading up to when this happened, we bounced around August 3 or 4, it looked like we were in the lower third of the range and when there was a shift from two units shifting to the minimum (he assumed) is when the issue revealed itself. He said that he was curious how closely that piece of the monitoring is being done by the Corps and if that might be a point of interest to be looking at closer to at least identify a space where we have to think about all the management actions that we talk about here. If it could be that marketing or other power-related management is able to utilize one of these two projects in a different way than they did. He asked if we can get there and do that kind of thing. He said that is the kind of thinking that is in the SMs heads, and in his head right now, looking at this whole process because there is a lot of things that stand out as to not quite adding up from their understanding of it. He said that he had one other question, he wanted to verify that the Doble testing was done for LGS on August 5 or August 6. He said that based on the data he assumed that was when it happened, but he had not heard when it had happened. He asked if someone could share that.

Ammann said that she does not have all the data, but she believes that the Doble testing did not occur at LGS this week.

Hesse said that it was communicated to them that Doble testing would not be done this because of the arcing incident that occurred earlier and that period of time that Doble testing was going to occur was going to be done on August 5 and 6, was utilized to make repairs. He said that was the reason for the powerhouse outage on August 5, it was not for Doble testing, it was to do repairs and Doble testing will have to be in the future.

Stranz reiterated that SM are keeping an eye on MOP operations and are very concerned with them and would request that AA do their very best to stay in in the lower part of the MOP range. Ammann had an idea of shifting operations to 0.7-foot

raised MOP instead of a full-foot raised MOP. The Corps will try that operating and keep an eye on it and see how the pools and water react. TMT will revisit this soon.

Thomas Starkey, Washington Ecology, said that he was not aware that the Doble testing was rescheduled. He said that was news. He requested the AA that when and if the Doble tests get rescheduled that the Water Quality Agencies be consulted before they are scheduled out of concern for similar operations next year and to maintain within the criteria for temperature.

Ammann said that they would reach out to Starkey after TMT. She said that we have a process with the region, including the States, that can provide input on the timing of that. She said that they would follow up afterwards.

Stranz said that for next TMT meeting Nancy Pionk would be facilitating. She said that she is committed to getting the agenda out ahead of time for the TMT process meeting on August 21, so if there are any agenda items please get those to her as soon as possible.

Morrill said prior to COVID, he recalled Norris suggesting a tour of the BPA Control Center in Vancouver for TMT to get a better perception of the Real Time scale operations. He asked if that would be a possibility again in the near future.

Norris said that it might be, he would talk to BPA about it. He said that the one in Vancouver is trickier than the duty scheduling center in Portland, but he would see what he could do.

Morrill said wherever it is that he would appreciate that opportunity because that is something that they hear about and he thinks seeing it would help him appreciate the fine scale things that you deal with at a broader scale.

4. **Set agenda for next meeting – August 14, 2024**

   a. Dworshak Update
   b. Operations Review

Today's Attendees:

Agency	TMT Representative(s)
NOAA Fisheries	Kelsey Swieca, Trevor Conder
Oregon	Erick Van Dyke
Washington	Charles Morrill
Kootenai Tribe	
Colville Tribe	Dennis Moore
Umatilla Tribe	Tom Lorz (CRITFC)
Yakama Nation	Keely Murdoch, Tom Iverson
Bureau of Reclamation	Chris Runyan
Army Corps of Engineers	Doug Baus (Chair), Julie Ammann, Lisa Wright
US Fish & Wildlife Service	Dave Swank
Idaho	
Montana	Brian Marotz
Spokane Tribe	
Nez Perce Tribe	Jay Hesse
Warm Springs Tribe	
Confederated Salish and Kootenai Tribes	
BPA	Tony Norris, Ben Hausmann

Other Attendees (non-TMT members):

COE – Daniel Turner, Eric Chow, Alexis Mills, Elizabeth Holdren, Tom Conning, Willow Walker

Washington Department of Ecology – Thomas Starkey

DS Consulting – Emily Stranz (Facilitator), Colby Mills

CorSource – Andrea Ausmus (BPA note taker, Contractor)

Clearing Up – K.C. Mehaffey

NPCC – Kate Self

Chelan PUD - Jay Fintz