OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE- 20LGS16 Powerhouse Roof Repair
COORDINATION DATE- August 13, 2020
PROJECT- Little Goose Lock and Dam
RESPONSE DATE- August 27, 2020

Description of the problem

The powerhouse roof at Little Goose Dam has reached the end of its projected life cycle and needs to be replaced. The reroofing effort will include the complete removal of the old built-up asphalt roofing system followed the installation of a new 2-ply membrane roof.

Proper sealing of the roof requires that it be installed during the summer when temperatures are high enough to properly seal the roofing material. The timeline for repairs would be from early July through September 2021. Performing the reroofing work at the Little Goose powerhouse is complicated by an electrical bus and 500 kVA power transmission lines that are located on the powerhouse roof structure directly above the proposed work area. The distance from the bottom of the bus structure to the surface of the roof averages 15 feet. The Corps requirement for safe clearance when working in the vicinity of power lines and bus supplying electrical power at a voltage of 500 kVA is 25 feet in any direction. Thus, the bus must be de-energized when performing the reroofing work.

To avoid shutting down all power generation for the duration of the reroofing project, Bonneville Power will cut the power to the bus and reroute it temporarily so that power is further than 25 feet from workers on the roof. This work to reroute the power is expected to take 4-5 days between 26-30 June 2021 and would require that all powerhouse units be out of service. An additional 4-5 day shut-down of the powerhouse will be required 11-15 October 2021 to reconnect the power.

Type of outage required

Impact on facility operation. Power to the juvenile fish facility will be off requiring operation by generator during the first and last day of each line outage in June and October 2021 and the adult ladder cooling pump will also be out of service during the first and last day of the line outage in June (Fish Passage Plan, Chapter 8, 2.4.2.14.). Attraction flow to the powerhouse fishway entrances via turbine units will also be reduced for the duration of each outage.

Impact on unit priority. All units will be OOS for 4-5 days in June and October (Fish Passage Plan, Chapter 8, Table LGS-5.) except for station service.

Impact on forebay/tailwater operation. None

Impact on spill. Spill will increase for 4-5 days in June and October while the powerhouse is OOS (Fish Passage Plan, App. E, 8.2.).

Dates of impacts/repairs. 26-30 June 2021 and 11-15 October 2021.

Length of time for repairs. Powerhouse will be OOS for 4-5 days in June and October 2021. Roof repairs will occur 1 July-30 September 2021.

Analysis of potential impacts to fish

1. 10-year average passage by run during the period of impact for adults and juvenile listed species, as appropriate for the proposed action and time of year;

   The 10-year average daily fish passage during 26-30 June is 568 adult Chinook salmon, 173 jacks, 50 sockeye salmon and 25 steelhead. During 11-15 October, the 10-year average count is 162 adult Chinook salmon, 104 jacks and 2,273 steelhead.

2. Statement about the current year's run (e.g., higher or lower than 10-year average);

   Projections for 2021 fish runs are not yet available.

3. Estimated exposure to impact by species and age class (i.e., number or percentage of run exposed to an impact by the action);

   During 26-30 June, 4% of adult Chinook salmon, 5% of sockeye salmon and 0.7% of the steelhead run, on average, will be impacted. During 11-15 October, 2.5% of adult Chinook salmon and 6.4% of adult steelhead will be impacted.

   Based on 2019 smolt index data from Little Goose Dam, 16,140 Chinook salmon smolts were passed during 26-30 June, represented about 0.6% of the total of roughly 2.5 million smolts. In 2020, the number was 44,748 smolts, or about 1.8% of the annual number passed.

4. Type of impact by species and age class (increased delay, exposure to predation, exposure to a route of higher injury/mortality rate, exposure to higher TDG, etc.);

   Juvenile salmon passage will be minimally impacted. TDG levels may be higher in June from increased spill. Adult salmonids passage will likely be delayed for the 4-5 day periods from lack of attractive flow via turbine units to the fishway entrances and from poor tailrace flow conditions (back eddy) during the powerhouse outages.

Summary statement - expected impacts on:

Downstream migrants. Possible exposure to elevated TDG.

Upstream migrants (including Bull Trout). Up to 4 to 5 day passage delay during poor tailrace conditions.

Lamprey. Up to 4 to 5 day passage delay during poor tailrace conditions.

Comments from agencies;

From discussion at 13 August FPOM. There was general concern raised for a full powerhouse outage in late June because of the likelihood to create adult fish passage delay.

Scott Bettin, BPA asked if the outage work could be earlier in 2021 or even late 2020? Discussions with the PDT confirmed that this would leave only units 1-4 in operation.

From: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>
Sent: Monday, August 24, 2020 9:52 AM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] Re: 20 LGS 16 MOC Powerhouse Roof Repair

Chris,

I have a few questions on this MOC. NOAA is concerned with the duration and timing of the outage given adult passage history with high spill at LGS

Can another safety measure be put in place so the current clearance is considered safe? An example would be a temporary barrier between the power line and the roof. Can the outage period be reduced substantially by working extra crews overtime or nights? Can the majority of the temporary line be installed when minimal adults are passing with final work being done during the late June period?

-Trevor

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Monday, August 24, 2020 10:48 AM
To: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>; Tom Lorz <lort@critfc.org>
Cc: St John, Scott J CIV USARMY CENWW (USA) <Scott.J.StJohn@usace.army.mil>; Scott Bettin <swbettin@bpa.gov>; Ann <Ann.L.Setter@usace.army.mil>; Hockersmith, Eric E CIV USARMY CENWW (US) (Eric.E.Hockersmith@usace.army.mil) <Eric.E.Hockersmith@usace.army.mil>
Subject: RE: [Non-DoD Source] Re: 20 LGS 16 MOC Powerhouse Roof Repair

Trevor,

I will contact the PDT about potential safety measures that may be possible. The question came up during FPOM if the 25 ft clearance is actually needed or can this be lessened. The PDT confirmed that this is not something that could be waived. It is a safety issue of course.

The outage period requested was 5 days. The PDT confirmed that they would likely get the work done in 4 days or possibly less. I will ask if night work would be possible. Again, this could be a safety issue.

We discussed the possibility of scheduling the outage during late 2020 or early 2021 when fewer fish are present. Once the jumpers have been installed, the powerhouse will be limited to units 1-4 operation. Having reduced powerhouse capacity during the spring runoff could impact the ability for the project to conduct the performance standard spill, depending on the water year and runoff timing. What are the relative risks?

Chris

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Tuesday, August 25, 2020 2:40 PM
To: 'Trevor Conder - NOAA Federal' <trevor.conder@noaa.gov>; 'Tom Lorz' <lort@critfc.org>
Cc: St John, Scott J CIV USARMY CENWW (USA) <Scott.J.StJohn@usace.army.mil>; Scott Bettin <swbettin@bpa.gov>; Ann <Ann.L.Setter@usace.army.mil>; Hockersmith, Eric E CIV USARMY CENWW (US) (Eric.E.Hockersmith@usace.army.mil) <Eric.E.Hockersmith@usace.army.mil>
Subject: RE: [Non-DoD Source] Re: 20 LGS 16 MOC Powerhouse Roof Repair

Trevor,

I heard back from the Chief of Ops, Lee Holmes in response to your questions. He provided some information for the three questions you posed;

I talked this over with Chief of Maint and Tech and hopefully have answered the three questions.

1. Are there other safety measures that could be used during the construction work that would not require the outage?

No, this is 500 kV (500,000 volt) bus work. Links immediately below are demos of 230 kV and 345 kV. Like the number suggests, 500 kV can be that much worse.
https://www.youtube.com/watch?v=08JRDgMC-fw
https://www.youtube.com/watch?v=VrY_k_pdlCs

2. Can the outage period (4-5 days) be shortened by having crews work long days and/or at night?

Of course. Almost any work can be done on a 24/7 schedule. But the bus work is critical infrastructure that requires specialized crews, that you can't just throw a bunch of backyard welders on, and it's unlikely BPA would be able to support. You would also need to have 2 extra crane operators that are certified to handle man baskets and possibly a specialized crane.

3. Can the majority of the temporary line be installed when minimal adults are passing with final work being done during the late June period?

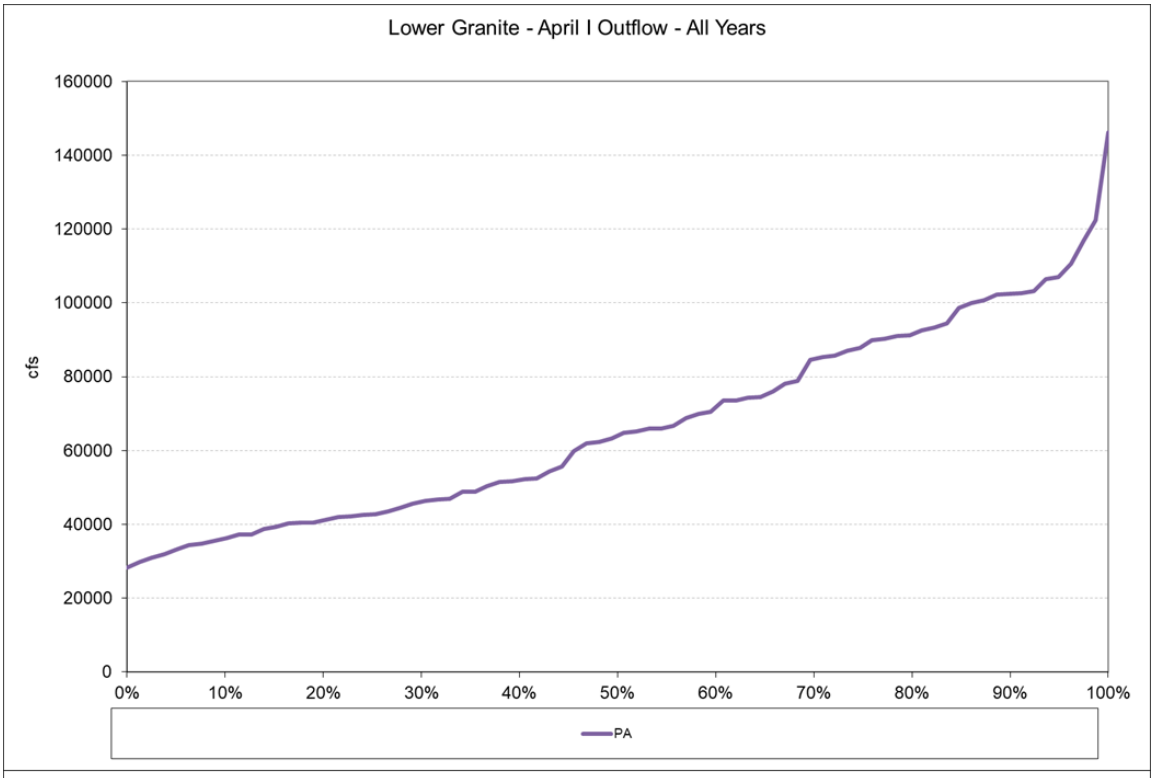
Lee repeated what I had mentioned below, that this would mean that the powerhouse would be limited to Units 1-4, likely during the spring spill season. The combined flow for units 1-4 at the upper end of the 1% range with 100 ft of head is 69.8 kcfs. Using mean daily flow from last May and June as a rough estimate, we would have had 21 days when the project would not have been able to maintain 30% spill with only units 1-4 operating. Adding unit 6, that dropped to 4 days with uncontrolled spill. Again, just a rough estimate.

Let me know if you have any more questions.

Chris

From: Bettin,Scott W (BPA) - EWP-4 <swbettin@bpa.gov>
Sent: Tuesday, August 25, 2020 2:40 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Cc: Sullivan,Leah S (BPA) - EWP-4 <lssullivan@bpa.gov>
Subject: [Non-DoD Source] LGS roof project flows

If July isn't acceptable for the four day complete powerhouse outage we could try doing it in early April. At that time all the spill could benefit juvenile fish and there are very few adults are passing. The only downside of doing it then is that the powerhouse would only have 4 units instead of 5 available. Unit 5 is down for another year so that's why it's only one less unit over the current situation. That would mean the powerhouse would be able to pass 100 kcfs (25 kcfs/unit) and approximately 80 kcfs more through the spillway during the 16 gas cap hours. During the 30% hours it would be able to pass 130 kcfs. With that capability the project could pass 150 kcfs with 8 hours at performance spill and 16 at max spill. Below are the month average graphs for flow through the Snake. During the month of April flows pick up a lot so that month has been split into two periods. -s


Lower Granite - April I Outflow - All Years
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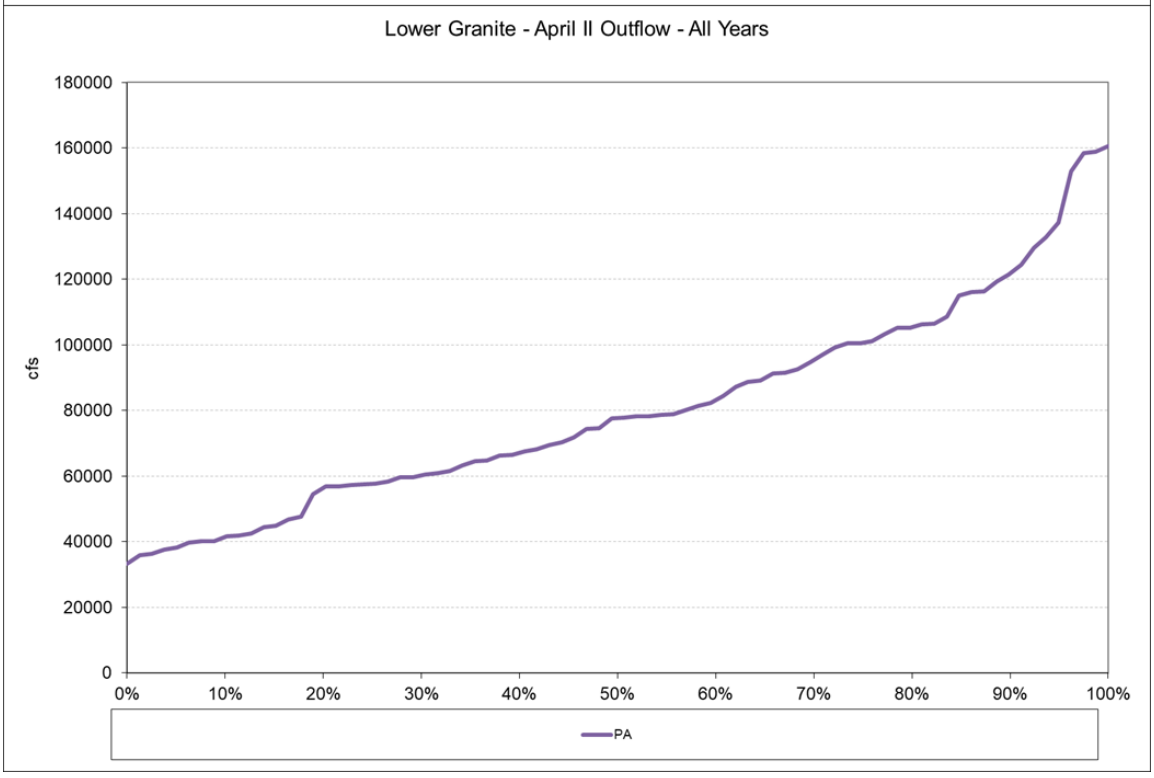
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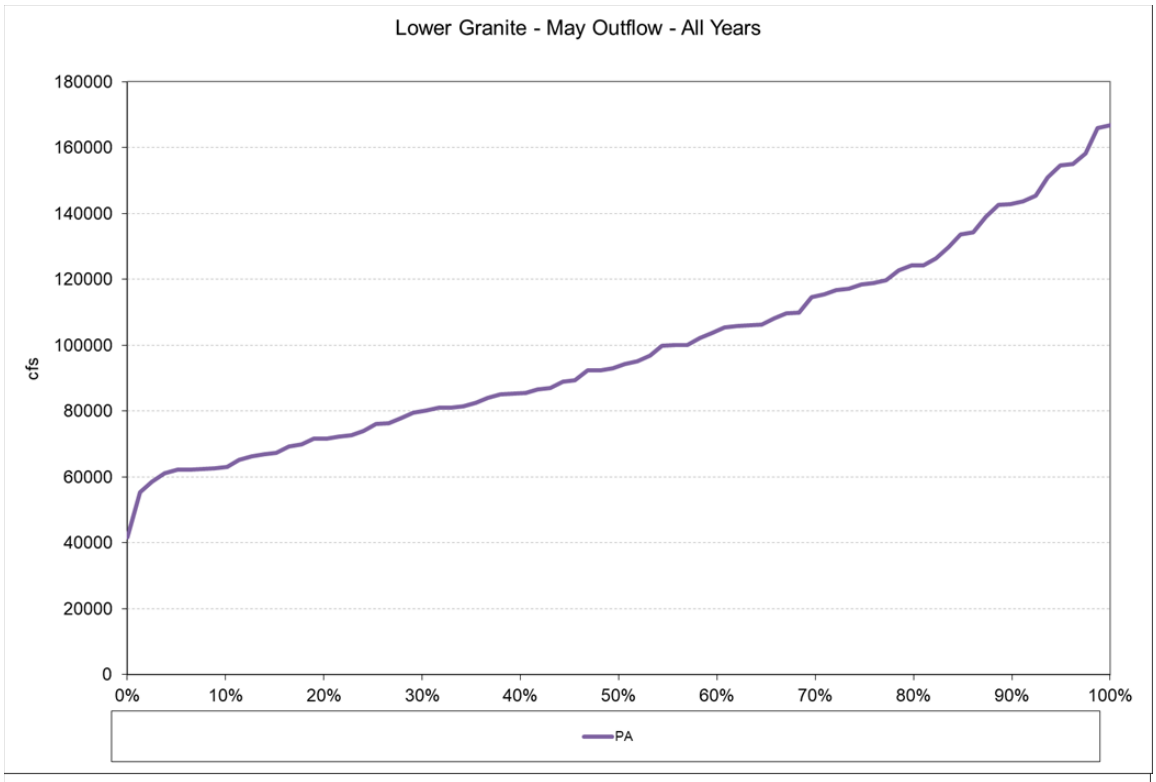

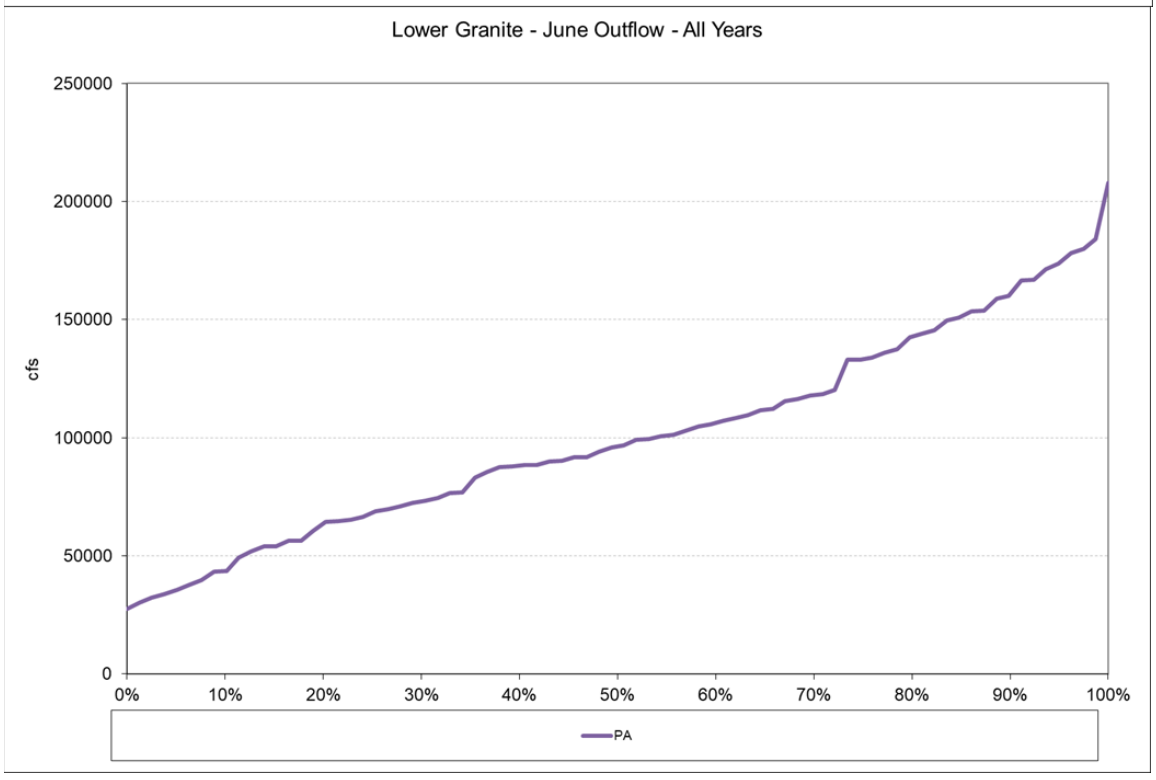

From: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Sent: Tuesday, August 25, 2020 5:49 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) **Subject:** [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

Chris,
Thanks for the additional information. It would be helpful if a few additional question might be addressed prior to making a decision about this MOC. What is the potential for the temporary fix be made into a permanent fix to avoid repeat coordination issues in the future? Please be clear that the most recent suggestion deals with only the rerouting of the line to meet the 25 ft safety restriction and not the actual roof repair work that appears to require July 1 through September 30 (3 months). How is weather involved in the potential shift to April when this was advertised as requiring warm weather? What other efficiencies might be possible to ready the line fix in preparation for reenergizing? Some more details may be helpful.

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From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Wednesday, August 26, 2020 7:17 AM
To: 'Erick VanDyke' <Erick.S.VanDyke@state.or.us>
Subject: RE: 20LGS16 MOC Powerhouse Roof Repair Update

Erick,

You are correct, the suggested change to the MOC is to move the bus line reroute and powerhouse 4-5 day outage to earlier in the year (April?) when fewer fish are passing the dam but the roof repair would remain during July-September. The bus line work would not be restricted by weather as is the roof repair. The MOC requests up to 5 days for the powerhouse outage but they are pretty confident the work can be completed in 4 days. That is likely the best working scenario for this outage.

Did that answer your questions Erick or are looking for more details for the bus line reroute process?

Chris

From: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Sent: Wednesday, August 26, 2020 9:34 AM
To: Peery, Christopher A CIV USARMY CENWW (USA)
Subject: [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

Chris,

Mostly. Not noticing a response to my first question. Any information on the potential to make the fix to a safe distance of 25 ft a more permanent fix to avoid this restriction adding constraints in the future?
Erick

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Wednesday, August 26, 2020 10:43 AM
To: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Subject: RE: 20LGS16 MOC Powerhouse Roof Repair Update

Erick,

Sorry, I mis-understood that part of the question. From what I understand, because there is a single transmission line from the dam, that would be a multi-million dollar modification to the system. So possible but not likely in the near future. Scott Bettin may have a better explanation on this process.

Chris

From: Bettin,Scott W (BPA) - EWP-4 <swbettin@bpa.gov>
Sent: Wednesday, August 26, 2020 10:02 AM
Subject: [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

No it is not possible to use the jumpers as a long term solution. It would take a complete rework of the bus and or another line from the substation into the project to give permanent clearance on the roof. The jumpers can only attach in such a way that units 1-4 will operate. If this solution was not introduced into the mix the outage would be around 100 days of spill during the day late June-Sept. So that is how we came to where we are of asking for input on whether or not to install them in April or June? -s

From: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Sent: Wednesday, August 26, 2020 10:36 AM
To: Scott Bettin <swbettin@bpa.gov>; Peery, Christopher A CIV USARMY CENWW
Subject: [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

Thanks Scott,
Thanks for the additional information and the effort to reshape the continuous 100 day outage to two periods (first 5 days the second 92 days) which as written would involve 97 days assuming no additional time is unreported for returning the line to the same route that ultimately impacted coordinated CRS management. I see the effort to fix reoccurring problems that have resulted in strained coordination as an important area to explore. There have been others that we have discussed recently that I hope to get better discussion around. However, what seems to be a more regular occurrence in recent coordination's is retention of inflexible layouts that are making out-of-water work more restrictive. What other actions might be possible to eliminate safety concerns like this one that effectively strain coordinated fish protection measures? Finding this solution seems

like a good potential for reducing the need for this type of coordination in the future. Which gets to the third question I posed originally "What other efficiencies might be possible to ready the line fix in preparation for reenergizing? This is where many could benefit from more discussion and clarity. I appreciate that you have been making efforts to provide this but hope more can be done.
Erick

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Wednesday, August 26, 2020 1:02 PM
To: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Cc: Baus, Douglas M CIV USARMY CENWD (USA) **Subject:** RE: 20LGS16 MOC Powerhouse Roof Repair Update

Eric,

I agree, there are concerns with the two options currently under consideration.

1. The 4-5 day powerhouse outage in late June (original MOC request) will create adult passage delays. Additional uncertainty is that flows may still be high enough at that time of year that TDG levels could be a concern.

2. If the powerhouse outage occurs earlier, such as April, the immediate impact to adult passage is reduced but there is the risk that the reduced powerhouse capacity (4 turbines) will result in periods in the following weeks when the 8 hrs of 30% performance standard spill is not possible leading to adult passage delays.

Since we do not know what the water year will look like it is not possible to weigh the relative risks. I feel option 1 has more of a known risk level while there is more uncertainty with option 2.

Is there another option to consider?

Chris

From: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Sent: Wednesday, August 26, 2020 3:37 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) **Subject:** [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

Chris,
I am sure there are several options that should be considered, one of which I provided earlier that was addressed with some common responses. However, this could open topic discussions that may not be productive in this venue, so I am choosing not to go there. It seems clear that the actual reason for needing an outage (25 ft criteria) is not being addressed as directly as the potential result of the outage (zero generation). These criteria

or actions are what put measures that protect fish passage at risk. Until this hump is resolved we seem to be stuck reliving decisions with potential for equally undesired results. As I mentioned in my last email I am less willing to risk issues that might occur with the 6 plus month alternative (option 2) than the original 3 plus month alternative (option 1). I am aware that others may desire to apply risk differently. Given that this work is being planned with ample time it is less clear why necessary information to make an informed decision is not being considered before locking in a final decision and schedule. No doubt this one is ripe for a Lorz-type wager based on its likeliness to occur as advertised. Appreciate your efforts to keep thinking about alternatives.
Erick

From: Ebel,Jonathan <jonathan.ebel@idfg.idaho.gov>
Sent: Wednesday, August 26, 2020 4:17 PM
To: Erick VanDyke <Erick.S.VanDyke@state.or.us>; Peery, Christopher A CIV
Subject: [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

Ideally, we would wait on this decision this until we have a reasonable prediction for the water year. However, it appears that is not an option.

Given the two options on the table, Idaho prefers Option 1 (original MOC). The risk of delay is known, but of a defined duration.

Option 2 (outage occurs in early April) has very uncertain effects where the upper end of the impact spectrum — a high water year resulting in longer periods of uncontrolled spill and reduction in performance spill hours than we would have otherwise— may cause unacceptably long adult passage delays. On the other side of the flow spectrum — low water year with early onset of high temperatures — a known 4-5 day adult passage delay could be pretty harmful and it may be prudent to have an off ramp for a 4-5 day outageif such conditions set up.
-JDE

From: Morrill, Charles (DFW) <Charles.Morrill@dfw.wa.gov>
Sent: Thursday, August 27, 2020 9:38 AM
To: Ebel,Jonathan <jonathan.ebel@idfg.idaho.gov>; Erick VanDyke <Erick.S.VanDyke@state.or.us>; Peery, Christopher A CIV USARMY CENWW
Subject: [Non-DoD Source] RE: 20LGS16 MOC Powerhouse Roof Repair Update

All,

I appreciate the dialogue and discussion points around this MOC.

There is imho no best option, however, that said, we would accept Option 1 as the ‘better’ option going forward.

Charlie

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Thursday, August 27, 2020 10:10 AM
To: Morrill, Charles (DFW) <Charles.Morrill@dfw.wa.gov>; Ebel,Jonathan **Subject:** RE: 20LGS16 MOC Powerhouse Roof Repair Update

Thanks you Charlie and Jon for your input. I am trying to gain some more information on the timing needed to make the decision on the bus line work. I suspect because of the specificity of the work, the crews would need to be scheduled as soon as possible.

Chris

From: Tom Lorz <lort@critfc.org>
Sent: Thursday, August 27, 2020 10:19 AM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] Re: 20LGS16 MOC Powerhouse Roof Repair Update

If we can get more information on the lead time on this that would be good. By February, March we have a good idea what kind of year we are going to have. Also what is the status of unit 6? If we only have unit 5 down then we are in situation that is not unlike most of the past years of missing one unit.

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Thursday, August 27, 2020 12:41 PM
To: Morrill, Charles (DFW) <Charles.Morrill@dfw.wa.gov>; Ebel,Jonathan **Subject:** RE: 20LGS16 MOC Powerhouse Roof Repair Update

FYI,

I found this presentation by NOAA that suggests current information forecasts ~60% chance for La Nina conditions for the fall and ~55% for the winter, which would lead to above average precipitation. For what that might be worth.

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Monday, August 31, 2020 9:47 AM
To: FPOM **Subject:** RE: 20LGS16 MOC Powerhouse Roof Repair Update

FPOM,

BPA still needs to make a trip to Little Goose to complete the design for the bus line reroute needed to make the roof replacement and they are currently under travel restrictions until 24 September. Since there is some flexibility in the scheduling at this

time, I suggest we leave the comment period for this MOC open and discuss at the September FPOM meeting.

Chris

From: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>
Sent: Wednesday, September 02, 2020 1:32 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: Re: [Non-DoD Source] Re: 20 LGS 16 MOC Powerhouse Roof Repair

Chris,

I am still interested in shortening the duration of this outage using overtime, night work, or additional crews. As requested, this outage duration and impacts are too excessive for me to approve at this point. Also, would this outage even need to occur if they repaired the roof in kind?

-Trevor

Trevor,

We have posed the question about overtime work to the BPA transmission shop who will be responsible for the bus line work. They have not yet completed their design of the work because of travel restrictions so they are limited in the ability to provide definitive answers. My understanding is that the welding needed for this job has to be near perfect to work because of the voltage involved and there is a limited number of crew with the skills needed. This limits their ability to use multiple crews or have crews work double shifts. But again, until the design has been completed, we may not have a good answer to your question.

I also sent your question about if this work is in-kind replacement or not to the project manager. The structural engineers will likely be the ones to answer that. I will let you know as soon as I hear something.

I have asked members of the PDT to join us for the FPOM meeting to help answer folks questions.

Chris

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Tuesday, September 08, 2020 1:31 PM
To: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>; Tom Lorz (lort@critfc.org) <lort@critfc.org>; Erick VanDyke <erick.s.vandyke@state.or.us>; Charlie Morrill <cfm97@me.com>; Jonathan Ebel <jonathan.ebel@idfg.idaho.gov>; David Swank (David_Swank@fws.gov) <david_swank@fws.gov>

Cc: Ann <Ann.L.Setter@usace.army.mil>; Hockersmith, Eric E CIV USARMY CENWW (US) (Eric.E.Hockersmith@usace.army.mil) <Eric.E.Hockersmith@usace.army.mil>; Scott Bettin <swbettin@bpa.gov>
Subject: RE: [Non-DoD Source] Re: 20 LGS 16 MOC Powerhouse Roof Repair

Trevor,

I can add some information here but I have asked members of the PDT to join the FPOM discussion Thursday to help better answer your questions.

Regarding working longer shifts and at night, the responses I have received are similar to Lee Holmes' initial response; theoretically it is possible if you have enough funds to pay for the added support crew, equipment, etc., but ultimately we have to learn from the BPA transmissions team, who are responsible for the welding work, if this is a realistic option. Do they have enough trained personnel to fill multiple shifts? Can they safely work at night and not impact work quality? I am hoping the PDT will be able to answer this.

Regarding the in kind question. The roof currently has two layers to it, the original when the powerhouse was constructed and a second layer put down in 1991. According to current building codes, replacing in kind is not really an option. This is the response I received;

> The current roofing system has 2 layers (the original roofing system – likely containing asbestos, and a recover layer in 1991). The following is from the Design Documentation Report for this project:
>
> "Per International Building Code (IBC) Section 1510.3.1., Item 3, a new roofing system is not allowed to be installed over the top of two or more existing roofing systems or layers. Removal of the top layer and recovering of the bottom layer of the existing roofing system carries a high likelihood of complications and is not recommended. "
>
> Therefore a complete tear-off and reroof is recommended. We may have a tight construction schedule as-is.

In the initial call we had with the PDT, they went through the different alternatives considered for the roof replacement including putting off the work (roof will eventually fail and need emergency outages) or adding transmission work and bus lines so this type of outage would not be needed in the future (adds $7-10 million to the cost and that work would require multiple outages). All work to be done in prep and setup to minimize the outage have already been built into the work plan. Moving the bus line work to earlier in the year to reduce the impact of the 4 day outage is worth considering but requires

operating the powerhouse with 4 or 2 (really just one since unit 5 is down for the year) units for the duration the bus line jumpers are in place.

More to come Thursday,
Chrisc

Final coordination results

After Action update (After action statement stating what the effect of the action was on listed species. This statement could simply state that the MOC analysis was correct and the action went as expected, or it could explain how the actual action changed the expected effect (e.g., you didn't need to close that AWS valve after all, so there was no impact of the action). List any actual mortality noted as a result of the action)

Please email or call with questions or concerns.
Thank you,