

## **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  
<lorz@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' <lorz@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](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.

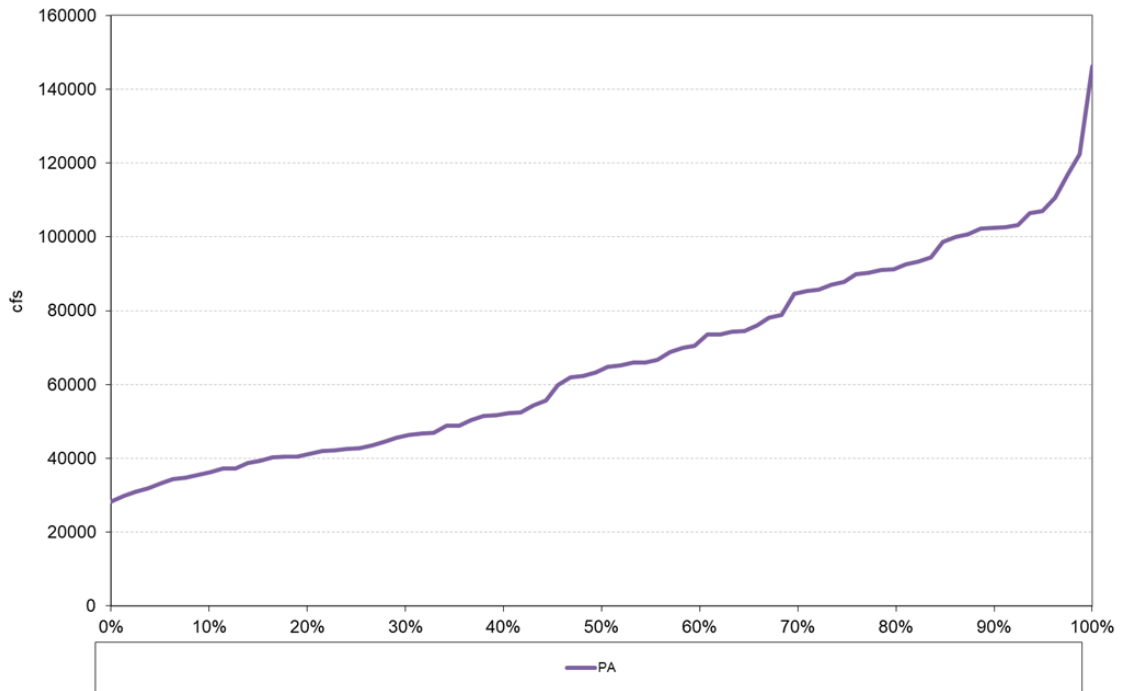
Let me know if you have any more questions.

Chris

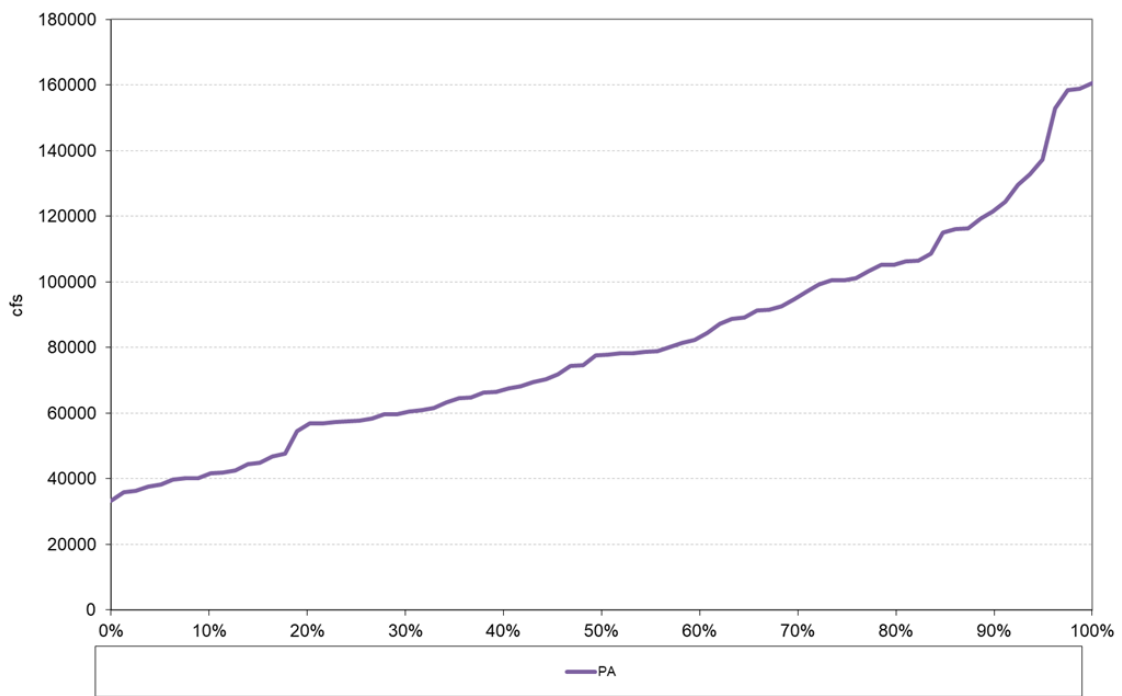
**From:** Bettin,Scott W (BPA) - EWP-4 <swbettin@bpa.gov>  
**Sent:** Tuesday, August 25, 2020 2:40 PM  
**To:** Peery, Christopher A CIV USARMY CENWW (USA)  
<Christopher.A.Peery@usace.army.mil>  
**Cc:** Sullivan,Leah S (BPA) - EWP-4 <lsullivan@bpa.gov>  
**Subject:** [Non-DoD Source] LGS roof project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

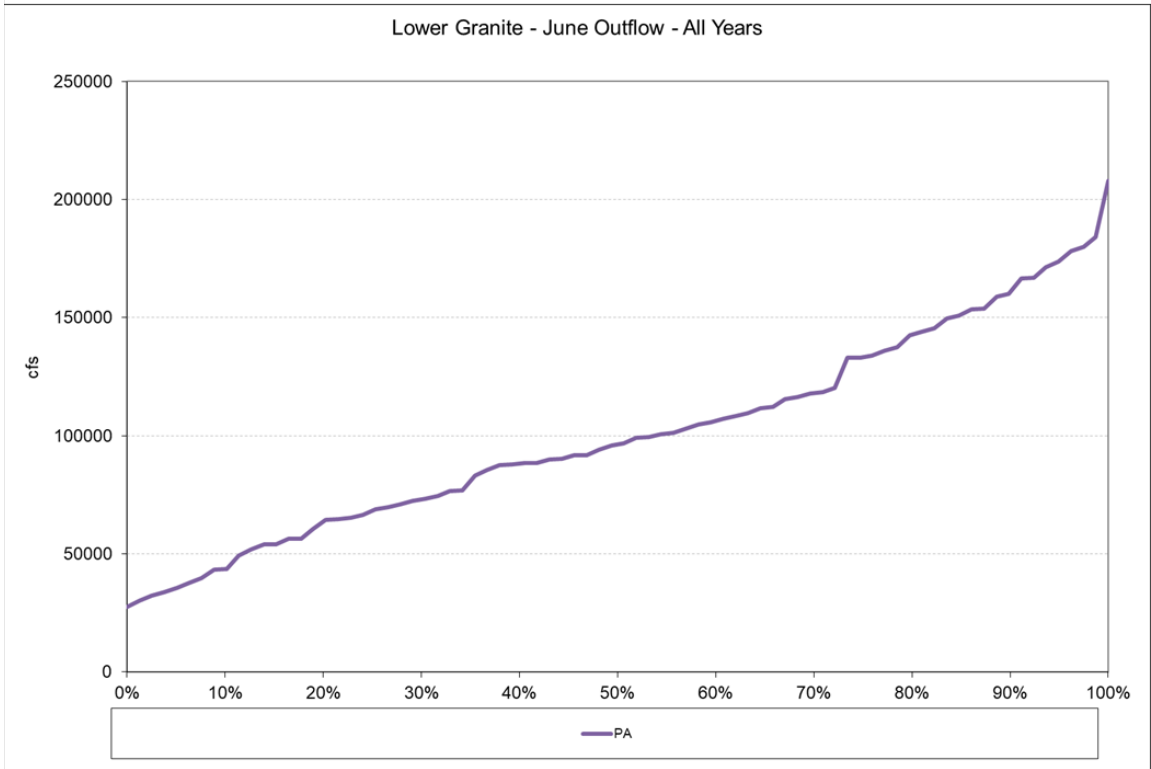
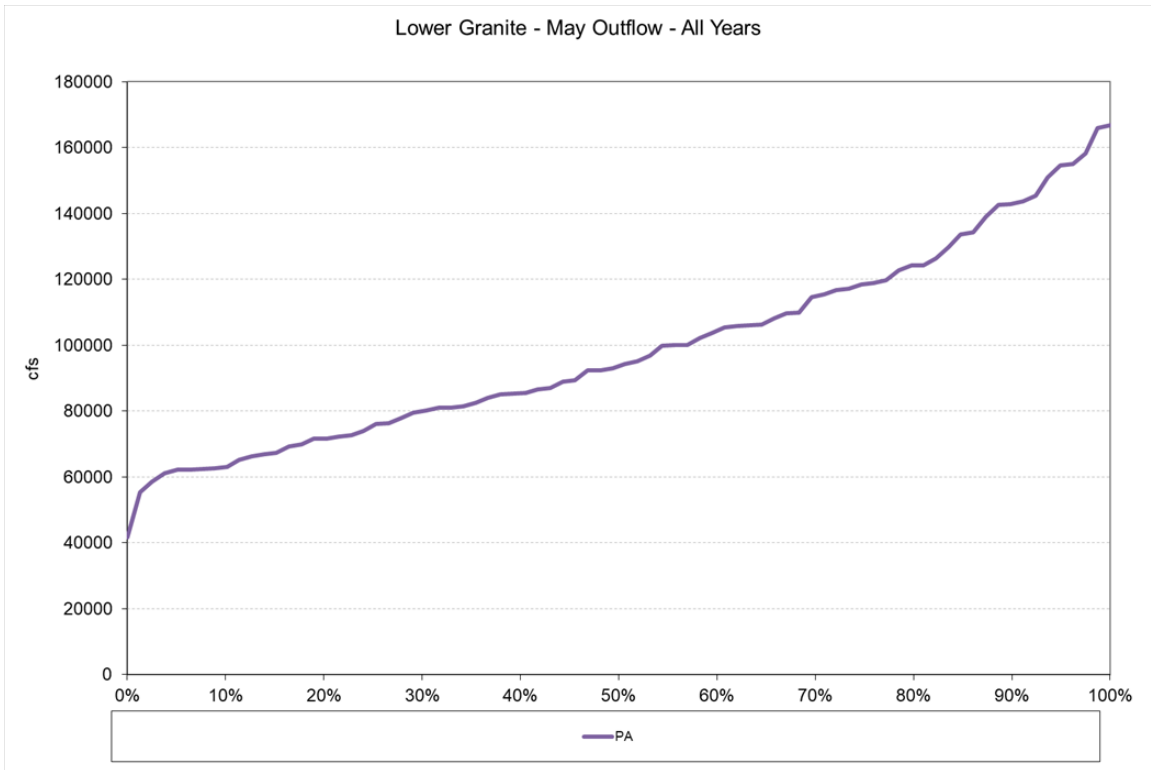
If July isn't acceptable for the four day complete powerhouse outage we could try doing it in early April. At that time all the spill could benefit juvenile fish and there are very few adults are passing. The only downside of doing it then is that the powerhouse would only have 4 units instead of 5 available. 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



Lower Granite - April II Outflow - All Years





**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,