OFFICIAL MEMO of COORDINATION (MOC) FOR NON-ROUTINE OPERATIONS & MAINTENANCE

COORDINATION TITLE- 21 LGS 12 Reconnection of High Side Bus to T2-A and T2-C Bushings
COORDINATION DATE- September 2, 2021, Update September 6, 2021
PROJECT- Little Goose
RESPONSE DATE- September 7, 2021

1. **Description of problem.** Doble testing revealed T2-A high side bushing had suffered damage during the catastrophic T2-C ground fault incident which occurred in March 2021. T2-A high side bushing was replaced in July 2021 and T2-C transformer was replaced in August 2021. Sections of the 500 kV bus work had to be cut and removed prior to these evolutions to provide proper clearance for removal and installation of new transformer. In order to place T2 transformer back in service, these sections of bus work must be reinstalled.

2. **Type of outage required.** This requires a complete line outage to provide worker and equipment safety while welding bus work to step up transformers T-2A and T-2C high side bushings which are in close proximity to a normally energized 500 kV line.

3. **Dates of impacts/repairs.** During the timeframe of 0900-1930 on 8-11 September, Unit 4 would be in speed/no load operation providing all station service power needs except for approximately 30 to 60 minutes at the very beginning and end of the outage while switching is occurring and only emergency diesel generators (EDG) are available. Station service power would power the adult fish ladder cooling pumps and fish pumps would be in operation during the outage except during beginning and end for switching. Work is anticipated to be completed in 3 days but the outage was requested for 5 days in case there are unforeseen problems. If it appears that a significant number of fish are being delayed over the first two days (i.e., a 25% drop in counts), the line outage will begin later in the morning on the third day to facilitate fish passage.

4. **Length of time for repairs.** The outage will begin at 0900 each day to facilitate switching and clearance procedures and to allow some time for fish to enter the fishway. The line will be restored, and normal operation will commence about 1930 each night.

5. **Impact on fish facility operation.** The JFF will be operating on EDG for approximately an hour at the beginning and end of the daily outages and running on station service during the remainder.

6. **Impact on project operations.** Little Goose will be disconnected from the 500 kV line, all Units out of service and spilling all river inflow for up to 1-hour at the beginning and end of the daily outages and operating Unit 4 for station service while the bushings are reconnected.

7. **Analysis of potential impacts to fish.** The 10-year average adult fish counts for September 8-10 include: 2,061 adult steelhead and 3,170 adult Chinook salmon (Figure 1). Upriver migrants including fall Chinook salmon and steelhead may be delayed due to the lack of attraction water from Unit Priority and high spill, with Unit 4 being the only unit in service.

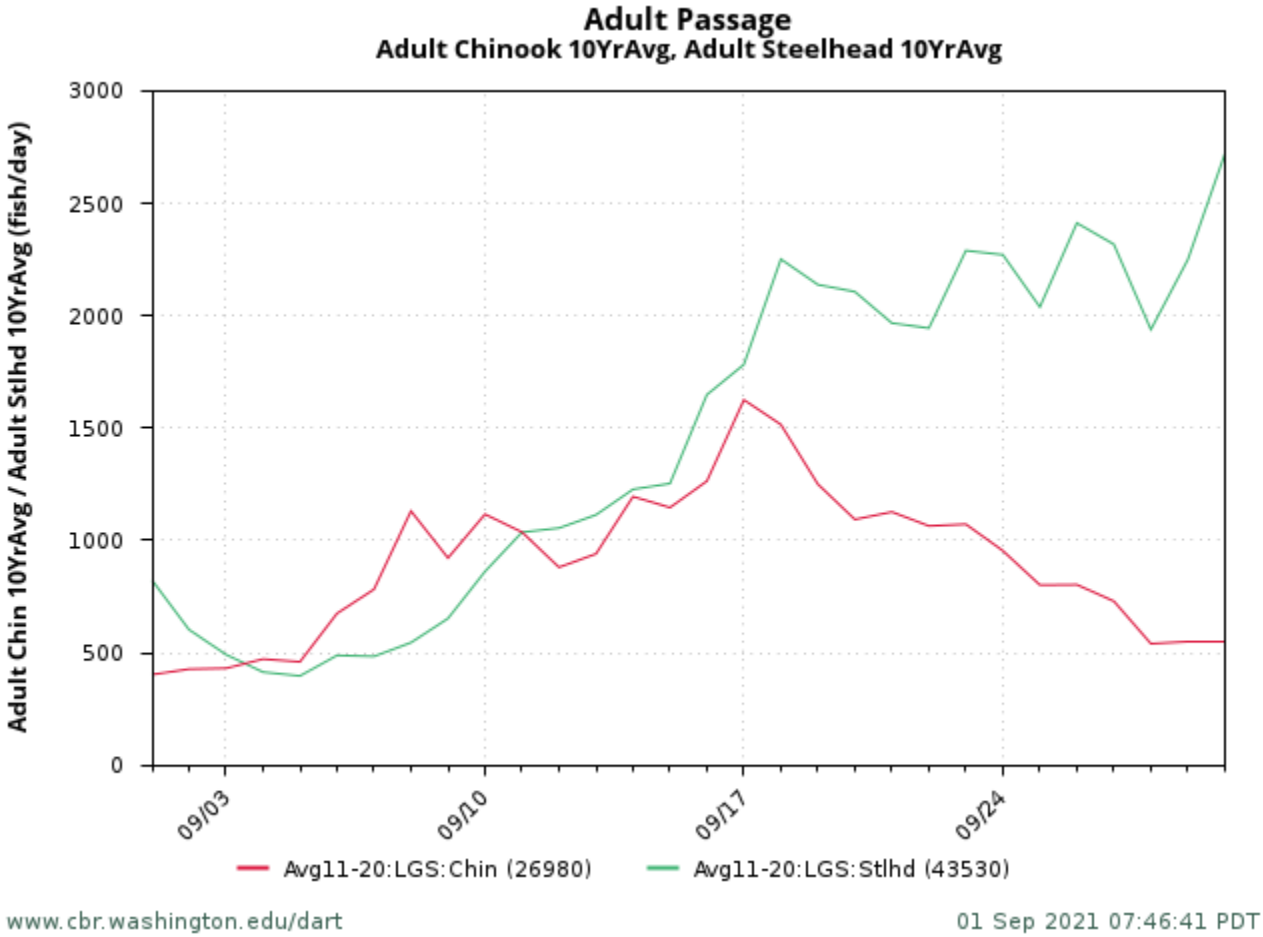

Figure 1. 10-year average Chinook salmon and steelhead counts at Little Gosoe Dam during September.

Little impact is expected to downstream juvenile migrants, as collection numbers are very low during this period. The 10-year average for juvenile salmonids collected and trucked from September 8-11 is 680 fish. The juvenile fish facility will continue collecting and transporting fish during this work.

8. Comments from agencies.

From: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>
Sent: Friday, September 03, 2021 10:05 AM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>; Barnes, Charles A CIV USARMY CENWW (USA) <Charles.A.Barnes@usace.army.mil>; Ritchie Graves - NOAA Federal <Ritchie.graves@noaa.gov>
Subject: [Non-DoD Source] Re: 21 LGS 12 MOC Reconnection of Bus for T2

Chris,

Given the documented passage delays and blockages that can occur at LGS during high spill, I don't think the number of morning hours described in the MOC (1.5) will be sufficient in passing fish without delay. The best thing to do would be to wait until November to do the work. If that can not be done, I would suggest they bump up the number of morning hours to at least 4 daylight hours, before

they begin to spill. So, if it is getting light at 6am, wait until 10am to begin. This would likely be sufficient given the time of year, flow levels, and ESU's passing right now. To accomplish their work on schedule, they could work later in the day, or add an additional day if absolutely necessary. If this is not possible, let me know as soon as possible so I can coordinate internally.

-Trevor

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Friday, September 03, 2021 1:16 PM
To: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>; Barnes, Charles A CIV USARMY CENWW (USA) <Charles.A.Barnes@usace.army.mil>; Ritchie Graves - NOAA Federal <Ritchie.graves@noaa.gov>
Subject: RE: [Non-DoD Source] Re: 21 LGS 12 MOC Reconnection of Bus for T2

Trevor,

The project has discussed this and would like to consider a 0900 start time. I think this would be workable as a way to alleviate fish delays. As noted below, besides creating a shorter work day, the later start time complicates the operations because of limited manpower during the shifts to shut down the powerhouse and start spill.

Would a 9am start time be acceptable?

Chris

From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Friday, September 03, 2021 4:15 PM
To: 'Trevor Conder - NOAA Federal' <trevor.conder@noaa.gov>; Barnes, Charles A CIV USARMY CENWW (USA) <Charles.A.Barnes@usace.army.mil>; 'Ritchie Graves - NOAA Federal' <Ritchie.graves@noaa.gov>
Subject: RE: [Non-DoD Source] Re: 21 LGS 12 MOC Reconnection of Bus for T2

Trevor,

I had not heard back from you so I told the project to go with the 9 am start time. They needed to get the schedule set with BPA and RCC and I did not want this to be hanging until Tuesday. I think this is a good path to reduce passage impacts while getting T2 back in operation soon. Call me on my work cell if you want to discuss. I usually have it with me.

Have a good weekend,
Chris

9. Final coordination results. FPOM consensus reached

10. After Action update.

Work was conducted 0900 to 1900 hrs on 8, 9 and 10 September as described. On 09/08/2021, the ladder exit cooling pump was taken offline at 07:50, returned to service at 14:15, taken offline at 18:45, and returned to service at 19:53 to facilitate switching from EDG and station service power according to the T2 line outage works outlined in 21 LGS 12 MOC. The switching process was repeated on 09/09/2021 taking the ladder exit cooling pump offline at 08:27, returning at 09:35, taken offline at 19:14, and returned to service at 20:05. Again on 09/10/2021; taken offline at 0851 and RTS 1810. Fish counts dipped lower initially during the outage but then recovered in the afternoon all three days.

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

Chuck Barnes
Little Goose Lock and Dam
Supervisory Fish Biologist
Charles.A.Barnes@usace.army.mil