Appendix E – Fisheries Agency EDR Review Comments and USACE Responses

From: Rerecich, Jonathan G CIV USARMY CENWP (USA) <Jonathan.G.Rerecich@usace.army.mil>
Sent: Tuesday, January 17, 2023 8:17 AM
To: FFDRWG
Subject: The Dalles AWS Backup Debris Management 60% Engineering Documentation Report review

Dear Fish Facility Design Review Work Group members:

Please find attached for your review The Dalles Dam Auxiliary Water Supply Backup Debris Management 60% Engineering Documentation Report.

This project is part of the Corps of Engineers' ongoing efforts to provide a reliable backup auxiliary water supply for the east fish ladder at The Dalles Dam to support operations during fish turbine rehabilitation and in the event one or both fish turbines are forced out of service. The report documents the alternatives evaluation developed by the Project Development Team and the recommended preferred alternative to carry forward to a 90% Engineering Documentation Report.

Your review of this Engineering Documentation Report is very important. The comment period is now open. You may send your written comments to Jon Rerecich at jonathan.g.rerecich@usace.army.mil, (503) 808-4779, by February 16, 2023.

Sincerely,

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From: Blane Bellerud - NOAA Federal <blane.bellerud@noaa.gov>
Sent: Friday, February 17, 2023 9:28 AM
To: Rerecich, Jonathan G CIV USARMY CENWP (USA) <Jonathan.G.Rerecich@usace.army.mil>
Subject: [Non-DoD Source] Re: The Dalles AWS Backup Debris Management 60% Engineering Documentation Report review

NMFS Comments on Dalles AWS debris cleaning system 60% Design

The Dalles AWS has gone from being a backup intended to be used primarily in emergencies, to plans to use it regularly. This is especially true during the fish turbine replacement period, So it is of great importance to fish passage at the Dalles. The combined approach appears to be reasonable, but relies primarily on indirect means of removing debris. It also includes a direct method using a crane operated brush. Assuming that a crane is always available if brushing is required, this may be acceptable. However, difficulties with cranes in the past cause me concern. There needs to be the capability to respond with direct action to remove debris when valve cycling and other indirect strategies fail. A system with built in capacity to operate the brush seems to be more certain than relying on the availability of a crane, the availability of deck crew to operate it and all the other potential delays that could lead to reduced fish passage efficiency at the Dalles if debris clogs the screen of the AWS.

Blane Bellerud Ph.D.

Dalles project Biologist

National Marine Fisheries Service

Thank you for your comments. USACE responses to comments are in blue.

1. The Dalles AWS has gone from being a backup intended to be used primarily in emergencies, to plans to use it regularly. This is especially true during the fish turbine replacement period, So it is of great importance to fish passage at the Dalles.

    - **Concur. Initially, the Auxiliary Water Supply Backup System (AWSBS) was intended to be used in emergencies if both fish units failed. Testing later revealed that if a single Fish Unit was out of service, the backup AWSBS system would improve the hydraulic performance of the East Fish Ladder and could be implemented during Fish Unit rehabilitation with an effective debris management system. The PDT preferred alternatives consist of both passive and active debris management strategies that can also be implemented following fish unit rehabilitation in the event one or both propeller fish units are forced out of service during fish passage season. We expect any fish unit forced outages post rehab would be infrequent and of short duration.**

2. The combined approach appears to be reasonable, but relies primarily on indirect means of removing debris. It also includes a direct method using a crane operated brush. Assuming that

a crane is always available if brushing is required, this may be acceptable. However, difficulties with cranes in the past cause me concern. There needs to be the capability to respond with direct action to remove debris when valve cycling and other indirect strategies fail.

- **The three-pronged strategy combines both indirect and direct means of removing debris. The passive (indirect) methods are floating debris boom and valve cycling with the use of level sensors to monitor head differentials. The last approach in the strategy is the direct method of debris removal using a dedicated hoist, rather than a crane, and brush system to engage with the trash racks.**

- **Project personnel have noted in the past that valve cycling alone has been effective. However, the longer operation of the AWSBS during Fish Unit rehabilitation may result in more debris accumulation compared to past experiences. If the first two methods of debris management are ineffective, the direct method of removing debris using the brush system would be implemented. Lastly, if the three-pronged debris management approach does not restore differentials to a safe operating range, as a last resort in an emergency, shutting off the AWSBS and pulling the trash racks to be pressure washed by project personnel on the deck could be requested.**

3. A system with built in capacity to operate the brush seems to be more certain than relying on the availability of a crane, the availability of deck crew to operate it and all the other potential delays that could lead to reduced fish passage efficiency at the Dalles if debris clogs the screen of the AWS.

- **If the debris boom and valve cycling are ineffective at restoring acceptable head differentials, both the preferred and next best alternatives have a dedicated hoist to operate the brush system and therefore will not rely on the project crane. Operation of the hoist and brush system will likely have to occur during regular project hours when maintenance crews are on site. The level sensors would provide the control room with real-time head differential readings across the intake. If the head differential reaches the two-foot differential trigger, the project will perform valve cycling. If feasible, the valve cycling should be limited to nighttime or non-peak fish passage hours.**

- **If approved by The Dalles Project, a pre-emptive cleaning schedule could be adopted similar to how Bonneville Maintenance structures the cleaning of Vertical Barrier Screens. For example: when head differential criteria is at or above a pre-determined level on a Thursday, the project could perform preemptive valve cycling or brushing prior to the weekend. This preemptive cleaning may help reduce extended outages and/or overtime labor burdens during the weekends. A schedule will be developed during the Design Documentation Report/Plans & Specs (DDR/P&S) phase of design.**

From: Tom Lorz <lort@critfc.org>
Sent: Thursday, February 16, 2023 1:24 PM
To: Rerecich, Jonathan G CIV USARMY CENWP (USA) <Jonathan.G.Rerecich@usace.army.mil>
Subject: [Non-DoD Source] Re: The Dalles AWS Backup Debris Management 60% Engineering Documentation Report review

I will not have time to write up a fancy doc but here are some of my comments

- I think the 3 prong approach is likely the best for this project; debris boom, brush system, and shutting off units and floating debris.
- On the debris boom how deep are we looking to have this sit. I am sure there is a depth cost relationship. I could not find how deep we are planning to have this boom sit, deeper better.
- For the brush system need to insure the current rake with the offset will work with the brush. Not that Bonneville is the gold standard for trash raking at the fish units but anything that was learned from that project should be incorporated.

Operationally we should figure out what the process will be to deal with debris, assume we need to know what kind of debris we have since some will react better to floating or brushing then others. So we may want to have some sort of process or criteria for when we float or brush. Seems like we should brush every so often to check to see if we are getting if anything and how easy it is to use as well as trying to stay in-front of debris build up.

If we find that the brush is not as effective as we would hope do we have a fall back or other types of material that could be tested to make sure we get the best cleaning possible. There might be a little trial and error necessary, but hence the question about reviewing Bonneville as well.

Hope that helps sorry I did not have more time to spend on this one. Looks to be going in a good direction

Thank you for your comments. USACE responses to comments are in blue.

1. I think the 3 prong approach is likely the best for this project; debris boom, brush system, and shutting off units and floating debris.

    - **Concur. Additionally, level sensors are included in the approach to monitor head differentials.**

2. On the debris boom how deep are we looking to have this sit. I am sure there is a depth cost relationship. I could not find how deep we are planning to have this boom sit, deeper better.

    - **The depth of the debris boom is not yet known at the 60% or 90% EDR phase. The debris boom depth will be determined using a Computational Fluid Dynamics model during the DDR phase. The preliminary alignment for the debris boom will encompass the area around the AWSBS intake located about 55' out from the upstream surface of the dam. The preliminary**

alignment has the east end of the boom intersecting the existing earthen embankment at the normal high pool elevation of 160 feet. The west end of the boom ties into the east end of Unit 22 intake.

3. For the brush system need to insure the current rake with the offset will work with the brush. Not that Bonneville is the gold standard for trash raking at the fish units but anything that was learned from that project should be incorporated.

   - **To clarify, the "current rake" concept is not based off the Bonneville brush/rake hybrid. The EDR preferred alternative utilizes a vertically hoisted brush which pushes debris up and down using flexible bristles. We can still use lessons learned from Bonneville for the hoist and maintenance, but the brush head will be different.**

   - **Further investigation and lessons learned from the modified rake that Bonneville Dam uses on their Fish Unit trash racks resulted in the PDT no longer pursuing a similar debris management solution for several reasons. The primary reasons being that the TDA AWSBS debris management design will not incorporate the use of the project crane and the lack of streamlined trash racks. The current trash racks of the AWSBS cannot be cleaned with a typical rake due to the vertical and horizontal members of the trash racks. These trash racks would cause snags with metal raking components engaging the trash rack and potentially damage the motor of either a dedicated hoist or the project's crane. At Bonneville, the large gantry crane is used for raking which can handle a large variety of hoisting forces that change while the modified rake collects debris. The TDA preferred and next best alternatives are designed to have a dedicated hoist and brush system. Instead of collecting, scraping, and hauling away debris like BON does for their trash raking, the brush system will push debris off and use the sweeping flow of the river to divert debris away from the intake while maintaining a near constant hoisting force the dedicated hoist can handle.**

4. Operationally we should figure out what the process will be to deal with debris, assume we need to know what kind of debris we have since some will react better to floating or brushing then others. So we may want to have some sort of process or criteria for when we float or brush. Seems like we should brush every so often to check to see if we are getting if anything and how easy it is to use as well as trying to stay in-front of debris build up.

   - **Concur. The PDT agrees that guidelines should be developed for how TDA may implement trash rack debris removal considering we have two methods – AWSBS shut down and brushing. A schedule will be developed with TDA project input during the DDR/P&S phase of design.**

   - **Based off of the ROV footage, a USACE botanist observed that the plants in the video on the trash racks at that time appear to be aquatic plant species that grow and root in muddy substrate and are not likely to be growing on the rack itself. The plants observed were soft, fragile, mostly composed of water, and should be able to break/tear if engaged mechanically.**

5. If we find that the brush is not as effective as we would hope do we have a fall back or other types of material that could be tested to make sure we get the best cleaning possible. There might be a little trial and error necessary, but hence the question about reviewing Bonneville as well.
    - **The PDT will continue to investigate utilizing several different sizes of brush bristle, with varying thicknesses, lengths, etc... It is likely that only one "size" of brush would be implemented since they are usually inserted into a rail/clamp style system, but we can have some variance in the actual bristles. We want to use the stiffest bristles possible that don't snap or break when they go over the protruding L-brackets.**

    - **If the three-pronged debris management approach does not restore differentials to a safe operating range, as a last resort in an emergency, shutting off the AWSBS and pulling the trash racks to be pressure washed by project personnel on the deck could be requested.**