OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE- 20 LGS 03 Spring Spill and Unit 1 Operating Range
COORDINATION DATE- April 16, 2020
PROJECT- Little Goose Dam
RESPONSE DATE- April 16, 2020

Description of the problem:
The current FPP states that Unit 1 will be operated to the upper end of ±1% peak efficiency range (approximately16-18 kcfs) to aid in tailrace hydraulics expected during the operation of the adjustable spillway weir (ASW). However, this operation shifts 4-5 kcfs of water from the spillway to the powerhouse when river flow is too low to achieve both the target spill rate and minimum generation requirements (Units 1-3 minimum generation range is 11.3-11.8 kcfs).

The concept of the flexible spill operation agreement is to maximize spillway passage and reduce PITPH as much as possible. The flexible spill operation may affect tailrace hydraulics. However, to learn if this operation can lead to better, long-term management and understanding the importance of PITPH, these potential adverse impacts would be acceptable for the remainder of the flexible spill agreement during spring spill operations. Review of this operation and long-term operation changes will continue as planned.

This MOC requests a change in unit priority (moves Unit 6 from second to last in operation, see section below *Impact on Unit Priority*). This MOC will also change the operation of Unit 1 under low flow, minimum generation conditions in the spring. Unit 1 will operate at the lower end of ±1% range (11.3-11.8 kcfs) during the 16 hour/day 125% gas cap spill operations when flows are at or below the level that allow the 125% TDG spill target. This will return operations to the spirit of the spill agreement during spring spill operations. During performance spill operations (remaining 8 hours/day), Unit 1 will be operated through out the ±1% range.

During summer spill operations, Unit 1 will continue to operate up to the upper end of the ±1% range during minimum generation operations.

Type of outage required - NA

Impact on facility operation (FPP deviations):
Alter footnote C, Table 1 of Appendix E (FOP) to operate Unit 1 at the lower end of the ±1% range during increased gas cap spill operations (16 hours/day) when 125% gas cap spill is targeted and we are at minimum generation conditions. During the remaining 8 hours of the day, operate Unit 1 through out the ±1% range as directed in the FPP and FOP, during performance spill (30%) operations. If Unit 1 is out of service, the priority unit (e.g., Unit 2) will be operated as described.

As river flow levels increase higher than that needed to meet the 125% TDG target spill level at Little Goose Dam (i.e. higher than minimum generation operation levels), available turbine units will be operated up to the upper ±1% range in the order of the turbine priority, as flows allow.

Suggestion footnote C edits to Appendix E, Table 1, Footnote C:
{Current FOP}

> *C. Little Goose Unit 1 is restricted to the upper 1% range (approximately 16-18 kcfs) when the SW is open and project outflow is greater than 38 kcfs. This operation pushes out the eddy formed by spill through the SW and improves tailrace hydraulics for fish passage (see FPP section 4.2.1.3).*

{Proposed FOP edits}

> *C. April 3 – 20 June; under minimum generation conditions (flows that allow spill up to the 125% TDG target spill), Unit 1 will operate at the lower end of the ±1% range (11.3-11.8 kcfs) during the 16 hours/day Gas Cap spill period. At higher river flows, Unit 1, and then subsequent units, will be loaded up to the upper end of the ±1% range in the order of the Turbine Priority (FPP Section 4.1), as flows allow. Unit 1 will be operated through out the ±1% range during the 8 hours/day performance spill periods. June 21 – August 31; Unit 1 will be operated at the upper end of the ±1% range when the ASW is open and project outflow is greater than 38 kcfs.*

Impact on unit priority:
Revert Turbine Unit Priority from 1,6,2,3,4,5 to 1,2,3,4,5,6 for remainder of spill operations, through August.

Impact on forebay/tailwater operation: NA

Impact on spill: Increase spill volume during gas cap spill operations (16 hour/day).

Dates of impacts/repairs:

> Implement as soon as possible and operate revised turbine priority through August.

Length of time for repairs: NA

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;
>
> During the period April 13 through June 20, approximately 56% of the adult Chinook salmon and 1.2% of the adult steelhead pass Little Goose Dam based on 10-yr averages. Based on the 2019 smolt index data, approximately 88% of the juvenile salmonids migration passed Little Goose Dam between April 13 and June 20.
>
> 2. Statement about the current year's run (e.g., higher or lower than 10-year average);

Predictions for 2020 call for lower than average returns for adult salmon and steelhead to the Snake River.

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

See 1 above.

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.);

Adult salmon passage is minimal at night. Adults in the tailrace at night may experience higher TDG levels. Affects to juveniles is unknown. Increased spill may improve passage survival by increasing the proportion passing via the spillway, but some juveniles may experience longer egress times and higher exposure to TDG levels in the tailrace.

Summary statement - expected impacts on:

Downstream migrants
Possible direct impacts to survival in the tailrace to juvenile migrants if tailrace egress is increased (e.g., elevated predation risk); although, increased spill may lead to decreases in PITPH.

Upstream migrants (including Bull Trout)
By continuing operation of Unit 1 at the upper ±1% range during daytime performance spill operations (8 hours/day), when adult passage peaks, the proposed change in operation should improve adult salmon and bull trout passage over current operations.

Lamprey
No anticipated impacts.

Comments from agencies

From: Tom Lorz [mailto:lort@critfc.org]
Sent: Friday, April 10, 2020 10:43 AM
To: Peery, Christopher A CIV USARMY CENWW (USA)
<Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] Re: 20 LGS 03 Spring Spill and Unit 1 Operating Range

Thanks for posting Chris.

Some additional information that I worked on for justification per say. Using spill curves for both Chinook and Steelhead (thanks trevor) at river flows between 45 kcfs and 65 kcfs the change in powerhouse passage would be ~3 for chinook and somewhere between 3-5% for steelhead. From previous COE studies on latent mortality (LM) the estimated LM for LGS has been around 12 - 20% for fish passing the JBS. Point estimates for Turbine survival for LGS from the 2012 studies were 87% for chioook and 80% for steelhead. The strategy behind the Flex spill agreement is to reduce Pit PH, this operation

will do that for both species and puts more fish in a passage route (spill) that should produce better survival and SAR's. This is rough analysis and I welcome others to take a dive into the data and see what errors I have made or other thoughts they may have.

Tom Lorz
CRITFC

-----Original Message-----
From: Erick VanDyke [mailto:Erick.S.VanDyke@state.or.us]
Sent: Friday, April 10, 2020 12:10 PM
To: Peery, Christopher A CIV USARMY CENWW (USA)
<Christopher.A.Peery@usace.army.milSubject: [Non-DoD Source] RE: 20 LGS 03 Spring Spill and Unit 1 Operating Range

Chris et al.,
I appreciate the effort to coordinate a correction to meet the 2020 Flexible Spill Operation agreement as written. To date BPA has applied the upper 1% priority operation regardless of what total river flow (kcfs) has been occurring in an hour. There was an expectation from flexible spill coordination that priority units would use the lower 1% minimum as expressed in planning documentation, which was documented in modeling parameters used to inform the flexible working groups understanding of fish benefits. Therefore we see the implementation of the upper 1% as going against the spirit of the agreement and as such is an unplanned benefit to power at the detriments of the other two objectives in the flexible spill agreement.

Oregon does not see this as an adequate change, because the current MOC proposal simply shifts the unsupported power benefit by moving the 5 to 7 kcfs increase in priority unit flow to a different set of hours without returning the fish protection measure or accommodating operational consistency of Flexible spill (16 hours of lower 1% unit priority flow) and the performance standard spill (8 hours 30%). The current MOC continues to provide an unplanned increase in the power benefit at the expense of the fish and Corps operational objectives. This unbalance is not consistent with the spirit of the agreement and as such is not yet supportable. When the MOC covers lower 1% priority unit operation during the 16 hours designated for flexible spill operation for spring spill (through June 20), and provides a repeated and dependable hourly application for easy operational application during COVID-19 staffing constraints I will be able to support it. Hope that this discussion can continue to right-the-ship.
Erick Van Dyke
Oregon Department of Fish and Wildlife
Ocean Salmon and Columbia River Program
Fish Passage/Mitigation Technical Analyst
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-----Original Message-----
From: Jay Hesse [mailto:jayh@nezperce.org]
Sent: Friday, April 10, 2020 1:00 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) Subject: [Non-DoD Source] RE: 20 LGS 03 Spring Spill and Unit 1 Operating Range

Chris et al - Operations at Little Goose Dam during the spring period, under the 2019 - 2021 Flex Spill Agreement include 16 hours of flex spill per day

at 125% TDG. The current 125% TDG spill cap estimate is 79kcfs. When flows are insufficient to meet the 125% gas cap, powerhouse generation should be at minimum generation. The planning assumption for minimum generation by the Nez Perce Tribe and other spill operations team participants since 2017 has been 11.8kcfs (11-14kcfs and operation in the lower 1% range as described in the July 18, 2017 Spill Operation Team Draft Summary of Potential Biological and Physical Spill Constraints provided to RIOG on July 19, 2017). As such, current operations and operations sought in this MOC which target 16kcfs flow through unit 1 during any of the 16 hour flex spill period(s) are inconsistent with my expectation for Spill Operations Agreement implementation and are not supported by the Nez Perce Tribe. The current MOC is a step in the right direction, but does not fully meet Spill Operation Agreement. Footnote C in Table 1 of the 2020 FOP should be applied only within the summer operation period. The FOP should be revised to reflect this and operations changed accordingly.

Jay Hesse

-----Original Message-----
From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Friday, April 10, 2020 2:32 PM
To:
Subject: RE: 20 LGS 03 Spring Spill and Unit 1 Operating Range

Erick and Jay,

Thanks for the comments and I can give you a brief response based on my understanding of the discussion at FPOM last Thursday. This MOC relates to a special operation for Unit 1 at Little Goose Dam when the ASW is in operation and flows are higher than 38 kcfs. Specifically the MOC requests a deviation from operating Unit 1 at the upper 1% at night for the remainder of the spring spill season. The relevant FPP language is;

4.2.3. Unit 1 Special Operation. During fish passage season when the ASW is open in Bay 1 and total project outflow is greater than 38 kcfs, Unit 1 will be operated in the upper 25% of the 1% range to smooth out the eddy that forms during ASW spill. Historically, the GDACS program tended to balance flow out of all units in operation. However, this special operation will at times result in unbalanced discharge where more flow is passing through Unit 1 than other operating units. Physical modeling indicated that a higher flow out of Unit 1 is critical to disrupting the eddy that forms along the south shore downstream of the powerhouse when the ASW is operating in order to optimize tailrace conditions for both adult passage and juvenile egress. When the ASW is removed from service during summer spill, the tailrace eddy is mostly non-existent and all turbine units may be operated within the full 1% range. When total project outflow is less than 38 kcfs, Unit 1 may be operated within the full 1% range as necessary to maintain MOP and spill operations pursuant to the FOP.

As Jay noted, the FOP refers to this special operation in footnote C of Table 1.

We are happy to address any comments regarding the special operation of Unit 1 at Little Goose. A discussion on the intent, spirit or assumptions that went into the development of the Spill Agreement and how that may relate to turbine unit operation range in general is, in my opinion, outside the scope this MOC. Possibly a topic for TMT?

Thanks,
Chris

-----Original Message-----
From: Morrill, Charles (DFW) <Charles.Morrill@dfw.wa.gov>
Sent: Monday, April 13, 2020 3:47 PM
To: Peery, Christopher A CIV USARMY CENWW (USA)
Subject: RE: Call for 20 LGS 03 MOC Spring Spill and Unit 1 Operating Range

Hi Chris,

WA does not support the operation of Unit 1 outside the lower 1 % range as currently proposed in the MOC.

A call tomorrow at 1 pm conflicts with a scheduled flex team conf. call.

Charlie

-----Original Message-----
From: Morrill, Charles (DFW) [mailto:Charles.Morrill@dfw.wa.gov]
Sent: Monday, April 13, 2020 4:06 PM
To: Peery, Christopher A CIV USARMY CENWW (USA)
Subject: [Non-DoD Source] Cfm Updated response to 20 LGS 03 MOC Spring Spill and Unit 1 Operating Range MOC
Importance: High

Hi Chris,

Oops .. one clarification to my response below: We do not support any operation of Unit 1 outside the lower 1 % range under any min gen scenario.

WA does not support the operation of Unit 1 outside the lower 1 % range as currently proposed in the MOC.
Charlie

-----Original Message-----
From: Ebel,Jonathan [mailto:jonathan.ebel@idfg.idaho.gov]
Sent: Monday, April 13, 2020 4:37 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) Subject: [Non-DoD Source] RE: Call for 20 LGS 03 MOC Spring Spill and Unit 1 Operating Range

Chris,
The call Charlie is referencing runs from 1400-1530 PDT. OR, WA, ID, NPT and potentially others are probably on that call. I am guessing availability for some tomorrow is limited to 1200-1400 PDT.

Regarding the MOC, we agree with NPT. We need to revisit the footnote in the FOP table and discuss its application to low flows in early spring when upstream migrating adults are in low abundance. To my knowledge, empirical evidence of juvenile entrainment in the eddy is limited, but may be an opportunity for future investigation.
-JDE

Jonathan D. Ebel
Staff Biologist, Bureau of Fisheries
Idaho Department of Fish and Game

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-----Original Message-----
From: Wright, Lisa S CIV USARMY CENWD (USA)
Sent: Thursday, April 16, 2020 5:58 PM
To: Peery, Christopher A CIV USARMY CENWW (USA)
<Christopher.A.Peery@usace.army.mil>; Baus, Subject: RE: 20 LGS 03 MOC - Update

Hello FPOM.

As requested, here is the teletype language sent to the Little Goose control room regarding the modified unit operations that were coordinated during our call this afternoon.

The "REFERENCE CBT" mentioned just refers to the teletype that was sent to the project with guidance for spring spill - this teletype overrides guidance in the reference teletype regarding the Unit 1 operating range.

Thanks and have a wonderful evening.

Best,
Lisa

1. EFFECTIVE IMMEDIATELY AND CONTINUING FOR THE REMAINDER OF SPRING SPILL (THROUGH JUNE 20), OPERATE LITTLE GOOSE TURBINE UNITS PER THE MODIFIED GUIDANCE DESCRIBED BELOW.

2. OPERATE AVAILABLE UNITS IN THE FOLLOWING MODIFIED PRIORITY ORDER: 1, 2, 3, 4, 5, 6

2.A) THIS MODIFIED UNIT PRIORITY ORDER MOVES UNIT 6 FROM SECOND PRIORITY TO LAST PRIORITY SO THAT FLOW IS MAXIMIZED THROUGH THE SOUTHERNMOST UNITS TO REDUCE THE TAILRACE EDDY TO THE EXTENT POSSIBLE.

2.B) THIS MODIFICATION SUPERSEDES THE PRIORITY ORDER DEFINED FOR SPRING SPILL IN THE 2020 FISH PASSAGE PLAN TABLE LGS-5.

3. THE OPERATION TO MANUALLY OPERATE UNIT 1 IN THE UPPER 1% DESCRIBED IN REFERENCE CBT PARAGRAPH 7 IS NOW ONLY IN EFFECT DURING 30% SPILL (8 HOURS/DAY). THEREFORE, OPERATE UNIT 1 PER THE MODIFIED GUIDANCE BELOW:

3.A) WHEN TARGETING GAS CAP SPILL (16 HOURS/DAY), UNIT 1 MAY BE OPERATED WITHIN THE FULL 1% RANGE.

WHEN RIVER FLOW IS INSUFFICIENT TO ACHIEVE THE SPILL CAP, OPERATE THE FIRST AVAILABLE PRIORITY UNIT AT MINIMUM GENERATION (LOWER 1% RANGE) AND SPILL THE REMAINDER OF OUTFLOW. PER FOP TABLE 1, THE MINIMUM GENERATION RANGE FOR UNITS 1-3 IS 11.3-11.8 KCFS.

3.B) WHEN TARGETING 30% SPILL (8 HOURS/DAY), MAXIMIZE FLOW THROUGH UNITS IN THE ORDER OF PRIORITY BEFORE MOVING TO THE NEXT UNIT (I.E., OPERATE UNIT 1 UP TO THE UPPER 1% LIMIT, THEN UNIT 2 UP TO THE 1% UPPER LIMIT, ETC.). IF PROJECT OUTFLOW DROPS BELOW 38 KCFS, UNITS MAY BE OPERATED WITHIN THE FULL 1% RANGE AS NECESSARY TO AVOID TURBINE DEADBANDS THAT OCCUR WHEN TARGETING A PERCENT SPILL AT LOWER FLOWS.

3.C) THE INTENT OF THIS OPERATION IS TO ALLOW UNIT 1 TO OPERATE IN THE LOWER 1% RANGE DURING MINIMUM GENERATION IN ORDER TO PASS MORE FLOW THROUGH THE SPILLWAY.

3.D) THIS MODIFIED UNIT 1 OPERATION REPLACES REFERENCE CBT PARAGRAPH 7 AND SUPERSEDES FPP SECTION 4.2.3, FPP TABLE LGS-5 FOOTNOTE a, AND THE 2020 FISH OPERATIONS PLAN (FOP) TABLE 1 FOOTNOTE C.

-----Original Message-----
From: Jay Hesse [mailto:jayh@nezperce.org]
Sent: Friday, April 17, 2020 12:48 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Chris - I appreciate the revisions and can live with this version.

Thank you for your work on this.

jay

-----Original Message-----
From: Erick VanDyke [mailto:Erick.S.VanDyke@state.or.us]
Sent: Friday, April 17, 2020 1:35 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Chris,
Thanks for your work on this, it is appreciated. Only thought I would request is that the full range language also be inserted where upper 1% language currently occurs in the mark-up version. I think it gets to the essence of the agreeable content without removing the operational objectives. Regards.
Erick

-----Original Message-----
From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Monday, April 20, 2020 7:30 AM
To: 'Erick VanDyke' <Erick.S.VanDyke@state.or.us>
Cc: trevor.conder@noaa.gov; 'Tom Lorz' <lort@critfc.org>; Scott Bettin <swbettin@bpa.gov>; Wright, Lisa S CIV USARMY CENWD (USA) <Lisa.S.Wright@usace.army.mil>; 'Morrill, Charles (DFW)' <Charles.Morrill@dfw.wa.gov>; Jonathan Ebel <jonathan.ebel@idfg.idaho.gov>; 'Jay Hesse' <jayh@nezperce.org>; 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: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Good morning Erick,

I have modified the wording in some locations. In some instances the wording, "up to the upper end" addresses the concern by Trevor that Priority units be loaded up before moving to the next unit in the priority order. See attached. Thanks for your input.

Chris

-----Original Message-----
From: Morrill, Charles (DFW) [mailto:Charles.Morrill@dfw.wa.gov]
Sent: Monday, April 20, 2020 11:59 AM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>; Erick
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20
Importance: High

Hi Chris,

WA strongly supports this MOC as worded!

Thank You !

Charlie

-----Original Message-----
From: Ebel,Jonathan [mailto:jonathan.ebel@idfg.idaho.gov]
Sent: Monday, April 20, 2020 12:21 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>; Morrill, Charles (DFW) <Charles.Morrill@dfw.wa.gov>; Erick VanDyke <Erick.S.VanDyke@state.or.us>
Cc: trevor.conder@noaa.gov; Tom Lorz <lort@critfc.org>; Scott Bettin <swbettin@bpa.gov>; Wright, Lisa S CIV USARMY CENWD (USA) <Lisa.S.Wright@usace.army.mil>; Jay Hesse <jayh@nezperce.org>; Setter, Ann L CIV USARMY CENWW (USA) <Ann.L.Setter@usace.army.mil>; Hockersmith, Eric E CIV USARMY CENWW (USA) <Eric.E.Hockersmith@usace.army.mil>
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Idaho also supports the revised MOC and FOP edits. Thank you.
-JDE
Jonathan D. Ebel

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-----Original Message-----
From: Erick VanDyke [mailto:Erick.S.VanDyke@state.or.us]
Sent: Monday, April 20, 2020 12:30 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Chris,
This is looking much better. I noticed what I thought were three typos that I modified for convenience. Let me know if I misunderstood something related to the typos. Additionally much of the focus of this change was meant to address Flexible spill operations or Spring spill periods. However there is something I want clarity on for summer language. In the past we have often used the unit minimum spill the rest in summer and had a special operation at Goose when flows were low. Is this language walking back the low flow operations during summer? I would like to know if the summer operations will continue to use the unit minimum spill the rest operations that the adaptive management process has become accustom too in past years? Thanks.
Erick

-----Original Message-----
From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Monday, April 20, 2020 1:43 PM
To: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Cc: trevor.conder@noaa.gov; Tom Lorz <lort@critfc.org>; Scott Bettin <swbettin@bpa.gov>; Wright, Lisa S CIV USARMY CENWD (USA) <Lisa.S.Wright@usace.army.mil>; Morrill, Charles (DFW) <Charles.Morrill@dfw.wa.gov>; Jonathan Ebel <jonathan.ebel@idfg.idaho.gov>; Jay Hesse <jayh@nezperce.org>; Setter, Ann L CIV USARMY CENWW (USA) <Ann.L.Setter@usace.army.mil>; Hockersmith, Eric E CIV USARMY CENWW (USA) <Eric.E.Hockersmith@usace.army.mil>
Subject: RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Erick,

Thanks for catching the typos. The original request at FPOM that resulted in this MOC was to modify the LGS special operation for Unit 1 during the spring spill season. It is my understanding that the special operation will still apply during summer when the ASW is in operation and flows are greater than 38 kcfs. Once the ASW is taken out of operation or flows drop below 38 kcfs, normal min gen operations will apply to all units during the summer. Summer operation is 30% spill, so minimum generation would not be needed until flows are below 22 kcfs I believe. Make sense?

Chris

-----Original Message-----
From: Erick VanDyke [mailto:Erick.S.VanDyke@state.or.us]
Sent: Monday, April 20, 2020 2:23 PM
To: Peery, Christopher A CIV USARMY CENWW (USA) <Christopher.A.Peery@usace.army.mil>
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Thanks Chris. I appreciate the reassurance that much will function as expected, of course early April this year has created quite a lot of discussion and using language that captures all conditions generally helps smooth operational expectations. It will be a point to watch as we move forward. From Oregon's position we will continue to emphasize fish protection measures not be used to decrease one at a hope that the other be made better... we would prefer both are maintained to improve passage benefits. A 30% operation at Little Goose using the lower 1% through Unit 1 could result in even less than 22 kcfs (14.69–15.34 kcfs flow)… but the upper 1% certainly would take it closer to 22 kcfs. I guess that is part of what I meant to enquire about. The other is when flow is <32kcfs spill it has been tiered to address the lower flow (<32kcfs–≥28kcfs=11kcfs spill; <28-≥22=9kcfs spill; <22kcfs=7 kcfs). It has been these nuances that have me asking additional questions. I anticipate that in 2020 summer spill will continue to follow the operations as they were delivered in 2018 and 2019 (many of the years before that too) and that the FOP not make new operational restrictions or changes to spill. I Appreciate all your work on putting this together.

Erick

-----Original Message-----
From: Morrill, Charles (DFW) [mailto:Charles.Morrill@dfw.wa.gov]
Sent: Monday, April 20, 2020 2:30 PM
To: Erick VanDyke <Erick.S.VanDyke@state.or.us>; Peery, Christopher A CIV USARMY CENWW (USA)
Subject: [Non-DoD Source] RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Chris, Erick,

Thanks for the additional comments and clarifications !

Charlie

-----Original Message-----
From: Peery, Christopher A CIV USARMY CENWW (USA)
Sent: Monday, April 20, 2020 2:48 PM
To: Erick VanDyke <Erick.S.VanDyke@state.or.us>
Subject: RE: 20 LGS 03 MOC Unit1-Priority-MinGEn 17Apr20

Erick,

Yes, it is my understanding that summer operations in 2020 will be similar to what has occurred the last couple of years.

Thanks,
Chris

Final coordination results

A conference call meeting was held April 16 and an agreement was reached on the changes to the FPP and associated FOP footnote C proposed wording, as described in this version. A teletype was sent to Little Goose Dam the evening of April 16, 2020 accordingly.

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 let me know if you have any questions or comments,
Thank you,

Christopher Peery, NWW
Christopher.a.peery@usace.army.mil