

FPP Change Form

Change Request Number: 11LGS004_Forebay Elevation of 633.5 to 634.5 feet for Navigation Safety

Date: October 28, 2010

Proposed by: Doug Baus, Corps, NWD

Location of Change:

On page LGS-6 add a new section titled:

“2.4 – Forebay Elevation of 633.5 to 634.5 feet for Navigation Safety”

Proposed Change:

“2.4 – Forebay Elevation of 633.5 to 634.5 feet for Navigation Safety”

During low flow conditions (daily average 30 kcfs or less) operate Minimum Operating Pool (MOP) at 633.5 to 634.5 ft. At these low flow conditions (30 kcfs or less) the Corps is unable to maintain the 15 ft. depth requirement at the sill to the Lower Granite Dam navigation lock for safety under normal MOP operations (633.0 to 634.0 ft.). Inadequate depth at the sill during low flows is caused by unit operations (switching on and off) and localized hydraulics caused by eddies.

Reason for Change:

In 2010 in coordination with TMT/FPOM the Corps increase MOP at LGS to 633.5-634.5 ft (Attachment 1) in order to provide safe navigation at the sill of the LWG navigation lock. The Corps provided LGS with operational instructions to modify minimum operating pool from 633.0 – 634.0 feet to 633.5 to 634.5 feet on August 5, 2010 and the Corps maintained this modified operation through August 31, 2010. Insufficient depth at the LWG navigation lock (Attachment 2) during low flow results from a wave cause by LGS operations and localized hydraulic effects in the LWG tailwater. It is likely navigation safety concerns will again occur at Little Goose Dam in 2011 when flows drop below 30kcfs.

Switching units on and off during low flow conditions can create waves because turbine flow represents such a significant portion of overall total river flow. For example, on August 14, 2010, 1200 hours: total flow was 31.9 kcfs, generation was 22.3 (2 units) kcfs, and spill was 9.2 kcfs (misc. flows 0.4). At 1300 hours: generation was 16.9 kcfs (1 unit), spill 7.4 kcfs, (1.8 misc) and river flow was 26.1 kcfs. When the two to one unit switch occurred, the 5.4 kcfs running through a turbine abruptly stopped. This sudden stoppage of 5.4 kcfs creates a wave that travels upstream because it represents such a significant component (20.6 %) of overall river flow. The observed wave at LWG navigation lock may cause the sill depth at the LWG navigation lock to drop down to 13.5 ft. Due to the 0.5 ft wave caused by LGS project operations and the navigation safety concerns this wave creates at LWG, the Corps increases MOP 0.5 ft.

Operations at LWG during low flow conditions creates hydraulic conditions (eddies) that form at the sill to the LWG navigation lock. These eddies create depressions in the water surface elevation and contribute to a depth of less than 14 ft at the sill. Based on the combination of these factors the Corps is unable to provide safe navigation over the sill.

Comments from others:

12 August 2010 FPOM Meeting Notes:

6.1. Wills commented that with the extra ½' MOP at LGS, which was discussed at TMT, there were no problems in the LGS pool, but experienced problems in the LMN pool. He understood some TMT members saying the extra ½' at LGS could solve the problems forever. He did not want that to be the final decision and wanted to make sure that is NOT what was being agreed to right now. Dykstra confirmed FPOM was comfortable with the plan he laid out for 2010 but not as a long term solution. A longer term solution will be discussed in FFDRWG.

FPOM may consider several low flow (between 30 and 40 kcfs) LGS operational changes (SW operation, LGS FBE increase of +0.5 ft from 633.0 – 634.0' to 633.5 - 634.5', Constant Spill vs. 30%) in the 2011 Fish Passage Plan (FPP). These operations are interrelated because they all converge on operational changes that may occur when flows are between 30 and 40 kcfs. Ensure the interrelated effects of all these actions are considered during the planning process so FPOM selects the best operation for 2011.
Doug Baus - Corps.

Record of Final Action: withdrawn - pending results from new gauge data.

Attachment 1: 2010 TMT Notification Regarding LGS MOP Operation

From: Barton, Steven B NWD

Sent: Thursday, August 05, 2010 12:45 PM

To: Allgood, Tiffany; Barquin, Billy; Baus, Douglas M NWD; Brandt, Scott; Denny, Lytle; Hovenkotter, Joe; Kiefer, Russ; Kruger, Rick; 'LeFleur, Cindy'; Litchfield, Jim; Lorz, Tom; Lovtang, Jens; Marotz, Brian; Norris, Tony; Ogan, John; Pavlik-Kunkel, Deanne; Roche, John; Rose, Bob; Sears, Sheri; Spurgin, Pat; Statler, Dave; Sue Ireland; Paul Wagner; Wills, Dave; BPA Scott Bettin; Boyce, Ron; Dittmer, Kyle; Domingue, Rich; Haeseker, Steve; Haller, Greg; Hassemer, Pete; BPA Robyn MacKay; Mellema, Mary; Steve Smith

Cc: Lear, Gayle N NWD; Peters, Rock D NWD; Feil, Dan H NWD; Johnson, Kimberly O NWD; Kanbergs, Karlis NWD; English, Scott E NWD; Dykstra, Timothy A NWW; Barton, James D NWD; Hall, Stephen C NWW; 'Erin Halton'; Robin Gumpert; Donna Silverberg

Subject: Official TMT Coordination: LGS MOP Operation

TMT Members and Alternates:

The possibility of raising the Little Goose (LGS) pool elevation above MOP for safe navigation was discussed at the July 28 TMT meeting. Flows in the Lower Snake are dropping and approaching 30 kcfs. These lower flow conditions, in conjunction with MOP operations set up waves and other local hydraulic effects that can impede safe navigation lock transit. As provided in the 2010 Summer Fish Operations Plan (FOP) "...adjustments to pool elevation in the Little Goose pool of up to 1.0 ft. above the MOP operating range may be necessary to accommodate safe entrance to the navigation lock..." To ensure safe navigation and meet minimum tailwater elevations at the Lower Granite (LWG) navigation lock, the Corps intends to operate the LGS forebay in a 1-foot range between 633.5 ft and 634.5 ft, effective this afternoon and likely for the remainder of August. The forebay issues at LGS might be exacerbated by the variable LGS spill (30%). As in 2009, through FPOM and TMT discussions, during the latter part of August, LGS reverted to a fixed spill. That change allowed smoother turbine operations and may have been beneficial to allow LGS to stay in MOP last year. The 2010 Summer FOP includes provisions for further spill adjustments at LGS through the FPOM/TMT process and we anticipate similar discussions this year. Please feel free to contact me if you have questions, comments, or concerns regarding this operation.

Steven B. Barton, P.E.
Chief, Reservoir Control Center
Northwestern Division
U.S. Army Corps of Engineers
Portland, Oregon
Phone: 503-808-3945
E-mail: Steven.B.Barton@usace.army.mil

Attachment 2: Snake River between Lower Granite and Little Goose Dams

