FPP Change Request Form

Change Form # & Title:	15LWG004 – Low Flow Spill Patterns w/ No RSW
Date Submitted:	July 9, 2015
Project:	LWG
Requester Name, Agency:	Corps NWW
Final Action:	**APPROVED – July 9, 2015**

FPP Section:

Table LWG-9. Spill Patterns w/ No RSW.

Justification for Change:

Currently, spill patterns with no RSW in Table LWG-9 are defined as low as 10.3 kcfs. However, during extreme low flow conditions, lower spill rates may be required. When spill is less than ~6.8 kcfs, the RSW in Bay 1 must be closed and spill passed via other bays.

This situation occurred August 23-31, 2013, and patterns were defined and implemented through in-season coordination with TMT. Considering this situation is likely to re-occur this year, patterns have been developed for the FPP to optimize egress conditions.

Proposed Changes:

See table LWG-9 below with new patterns in track changes (Total Spill 1.7 – 8.5 kcfs).

Table LWG-9. Lower Granite Dam Spill Patterns for Fish Passage with No RSW. [a]

LWG Spill Patterns with No RSW - Gate Stops (#) per Spillbay								Total Stops	Total Spill
Bay 1	Bay 2	Bay 3	Bay 4	Bay 5	Bay 6	Bay 7	Bay 8	(#)	(kcfs)
CLOSE							1	1	1.7
CLOSE	1						1	2	3.4
CLOSE	1					1	1	3	5.1
CLOSE	1				1	1	1	4	6.8
CLOSE	1	1			1	1	1	5	8.5
CLOSE	1	1			1	1	2	6	10.3
CLOSE	1	1			1	2	2	7	12.1
CLOSE	2	1			1	2	2	8	13.9
CLOSE	2	2			1	2	2	9	15.7
CLOSE	2	2	1		1	2	2	10	17.4
CLOSE	2	2	1	1	1	2	2	11	19.1
CLOSE	2	2	2	1	1	2	2	12	20.9
CLOSE	2	2	2	1	2	2	2	13	22.7
CLOSE	2	2	2	2	2	2	2	14	24.5
CLOSE	2	2	2	2	2	2	3	15	26.4
CLOSE	2	2	2	2	2	3	3	16	28.3
CLOSE	3	2	2	2	2	3	3	17	30.2
CLOSE	3	3	2	2	2	3	3	18	32.1
CLOSE	3	3	3	2	2	3	3	19	34.0
CLOSE	3	3	3	2	3	3	3	20	35.9
CLOSE	3	3	3	3	3	3	3	21	37.8
CLOSE	3	3	3	3	3	3	4	22	39.6
CLOSE	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**23**	**41.4**
CLOSE	4	3	3	3	3	4	4	24	43.2
CLOSE	4	4	3	3	3	4	4	25	45.0
CLOSE	**4**	**4**	**4**	**3**	**3**	**4**	**4**	26	46.8
CLOSE	4	4	4	3	4	4	4	27	48.6
CLOSE	**4**	**4**	**4**	**4**	**4**	**4**	**4**	28	50.4
CLOSE	4	4	4	4	4	4	5	29	52.3
CLOSE	**5**	**4**	**4**	**4**	**4**	**4**	**5**	30	54.2
CLOSE	5	4	4	4	4	5	5	31	56.1
CLOSE	5	5	4	4	4	5	5	32	58.0
CLOSE	**5**	**5**	**5**	**4**	**4**	**5**	**5**	33	59.9
CLOSE	5	5	5	4	5	5	5	34	61.8
CLOSE	5	5	5	5	5	5	5	35	63.7
CLOSE	5	5	5	5	5	5	6	36	65.6
CLOSE	5	5	5	5	5	6	6	37	67.5

a. Table defines spill patterns in increments of 1 gate stop per row. "Total Spill" is calculated as a function of total gate stops at forebay elevation 734.0 ft (**bold** patterns evaluated w/ Corps' LWG 1:80 physical general model). Patterns in real-time are automatically interpolated as necessary to target desired spill rate at observed forebay.

Comments from others:

7/9/2015 FPOM: There were concerns about not having model data at these low spill rates to evaluate the proposed changes. Hevlin proposed a model trip in October. Wright asked for comments. FPOM was reasonably willing to test something this summer but wanted a commitment to a model trip in October. Van Dyke would like to see a flat pattern. He will send comments to Wright.

7/15/2015 email:

From: Wright, Lisa NWD
Sent: Wednesday, July 15, 2015 8:26 AM
To: FPOM
Subject: FPOM: FPP Change Forms - Update on LWG, LMN, IHR low flow spill patterns

Good morning FPOM -

At last week's FPOM meeting, we discussed three FPP change forms to add lower spill patterns at Ice Harbor (15IHR008), Lower Monumental (15LMN004), and Lower Granite (15LWG004). FPOM supported the need for these lower spill patterns given this year's low flow conditions, and were in general agreement with the uniform patterns proposed for Lower Granite. There were concerns that the patterns proposed for IHR and LMN may need to be more uniform, but there are no modeling data to evaluate patterns at these low spill rates (1.7-6.8 kcfs). FPOM requested more time to review and provide comments on the low flow spill patterns for IHR and LMN in the event they need to be implemented this year.

Currently, low flow conditions are requiring Lower Granite spill below 10.3 kcfs. As such, the low flow spill patterns defined in change form **15LWG004** are being implemented during those hours when Lower Granite total outflow is less than approximately 28.6 kcfs (assuming Unit 1 min gen is ~18.3 kcfs). These flow conditions were first met yesterday, July 14, at 10:00.

The lower spill patterns for IHR and LMN will be required if total project outflow drops below ~20 kcfs. The current STP indicates inflow in the range of 20-23 kcfs in late August, so there may be some hours when these lower spill patterns are required. Therefore, it is requested that FPOM representatives review the low flow spill patterns proposed in change forms 15IHR008 and 15LMN004, and provide comments for discussion and finalization at the August 13th FPOM meeting.

All change forms are available on the FPP website at: http://www.nwd-wc.usace.army.mil/tmt/documents/fpp/2015/changes/.

Please let me know if you have any questions or need any further information.

Best,

Lisa

From: Bill Hevlin [mailto:bill.hevlin@noaa.gov]
Sent: Wednesday, July 15, 2015 11:12 AM
To: Wright, Lisa NWD
Subject: Re: FPOM: FPP Change Forms - Update on LWG, LMN, IHR low flow spill

Hi Lisa,

Thanks for following up with us on these low flow spill patterns. I spoke with Greg moody yesterday about the pattern for lower granite when river flow drops below 28 kcfs. The reduction of spill stops looks fine to me, going down to one per bay, leaving an extra stop on the north side of the spillway, and spreading the stops out. I say this from experience with higher flows in models at ERDC, and viewing tailraces, but this

opinion could be better founded if we took the time to view these low flow conditions in the models at ERDC, especially the new granite model.

With regard to LoMo and Ice projects, the RSW's should be closed at these low flows, and spill spread evenly across the spillways, that is unless Trevor has a different opinion. And like at granite we could really benefit from looking at these models at ERDC with river flow at 25 kcfs, I don't think we ever have.
Bill Hevlin

Record of Final Action:

7/9/15 APPROVED for implementation this year. FPOM would like to plan a model trip in October to evaluate spill patterns at these low rates.