# Fish Passage Plan (FPP) Change Request Form

**Change Form # & Title**: 21LGS003 – Unit 1 Special Operation & Unit 6 Priority

**Date Submitted**: 4 January 2021

**Project**: Little Goose

**Requester Name, Agency**: FPOM (in-season adaptive management coordinated in 2020)

**Final Action: APPROVED – 11 February 2021**

**FPP Section**:

Little Goose Table LGS-5 “Unit Priority Order” and section 4.2.3 “Unit 1 Special Operation”

**Justification for Change**:

The current FPP defines a special operation to restrict Unit 1 to the upper 1% to push out the tailrace eddy that forms during ASW spill. Through in-season FPOM coordination in 2020, the operation was modified to ***not apply*** during hours of spring gas cap spill. The intent was to allow Unit 1 to operate to the lower 1% during min gen in order to have more flow remaining for spill.

As part of the modification, the spring unit priority order was modified to move Unit 6 from second priority to sixth priority to maximize flow through the southernmost units and reduce the tailrace eddy.

The modified 2020 operation was as follows:

* 1. During spring gas cap spill, Unit 1 may be operated to the lower 1% when river flow is too low to achieve the spill cap (i.e., min gen, spill the rest).
  2. During spring 30% spill, maximize flow through available units in the order of priority (south to north) before moving to the next unit (i.e., Unit 1 upper 1%, then Unit 2 up to upper 1%, etc.). If project outflow drops below 38 kcfs, Unit 1 may be operated within the full 1% range as necessary to avoid turbine dead-bands that occur when targeting a percent spill at lower flows.
  3. Move Unit 6 from second priority to sixth priority (1, 2, 3, 4, 5, 6).

**Proposed Change**:

If FPOM recommends incorporating this modified operation into the 2021 FPP, the language would be edited as shown below in track changes. Otherwise, modifications will need to be coordinated in-season.

4.1. Turbine Unit Priority Order.

**4.1.1.** From March 1–November 30, turbine units will be operated in the order of priority defined in **Table LGS-5** to enhance adult and juvenile fish passage. If a turbine unit is out of service for maintenance or repair, the next unit in the priority order shall be operated. Unit priority order may be coordinated differently for fish research, construction, or project maintenance activities.

**4.1.2.** If more than one unit is operating, discharge will be maximized through the southernmost unit (i.e., operated in the upper 1% range) starting with Unit 1 to the extent possible. See **section 4.2.3** for more information.

Table LGS-5. Little Goose Dam Turbine Unit Priority Order.

|  |  |
| --- | --- |
| **Dates / Season** | **Unit Priority Order** |
| March 1 – November 30  Fish Passage Season | 1**a**, 2, 3, 4, 5, 6  *During ASW spill and outflow >38 kcfs, maximize discharge through highest priority units* |
|  |  |
| December 1 – end of February  Winter Maintenance Period | Any Order |

**a. Unit 1 special operation (section 4.2.3. – *does not apply during spring gas cap spill*):** When the ASW is open and total outflow is > 38 kcfs, Unit 1 will be operated in the upper 1% range (~16.0–17.5 kcfs) to smooth out the eddy that forms during ASW spill. Assume other units operate approximately uniformly within their full 1% ranges. When other units are discharging < 16.0 kcfs, assume Unit 1 is at the lower end of the upper 1% (~16.0 kcfs). When average unit discharge is > 16.0 kcfs, assume all units are operating uniformly.

4.2. Turbine Unit Operating Range.

**4.2.3. Unit 1 Special Operation.** *[The operation described in this section does* ***not*** *apply during spring spill to the gas cap. When spilling to the gas cap in the spring, April 3–June 20, Unit 1 may be operated down to the lower 1% range in order to pass more flow as spill when flows are too low to achieve the spill cap target.]* During fish passage season (except during spring spill to the gas cap), 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 quarter 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.

**Comments**:

28-January-2021 FPOM FPP Meeting: Conder and Lorz were in support. VanDyke wasn’t ready to endorse. Bettin asked about the unit priority table where it says to maximize discharge in the order of priority March 1-November 30. He wondered if the project was ok with this since there may be times outside of spill season when they need more flexibility. Wright noted that the project was able to successfully implement last year but will follow up. **[ACTION: added “*During ASW spill and outflow > 38 kcfs…*” to the note in the unit priority table to clarify when to maximize discharge through the highest priority unit. Otherwise it would be interpreted to apply during the entire timeframe of March 1-November 30.]**

PENDING – will be reviewed at FPOM on February 11.

11-FEB-2021 FPOM: Van Dyke added that OR supports the lower 1%.

**Record of Final Action**: Approved at the FPOM meeting on 11-FEB-2021.