# Fish Passage Plan (FPP) Change Form

**Change Form # & Title**: 22MCN003 – Orifice Operation

**Date Submitted**: 26-JAN-2022

**Project**: McNary Dam

**Requester Name, Agency**: Bobby Johnson, USACE NWW

**Final Action: APPROVED 10-FEB-2022**

**FPP Section**: Chapter 5 – McNary Dam, sections 2.3.2.3.(i), 3.2.2.3. & 3.2.2.4.

**Justification for Change**: Update to provide consistent language and eliminate confusion. Section 2.3.2.3. states that both orifices in an operating turbine Unit with ESBSs in place can be closed for no longer than 10 hours. Section 3.2.2.4. states that if both orifices are closed that the turbine Unit will be taken out of service, then goes on to state similar verbiage seen in section 2.3.2.3. related to orifices being closed for up to 10 hours. The statements between and within section contradict themselves and need to be updated. In the rare event that both orifices in an operating Unit need to be closed, the allotted timeframe allows personnel to troubleshoot issues.

Section 3.2.2.3. describes cleaning vertical barrier screens (VBSs). This is the only routine work that requires closing both orifices in a gatewell of a screened slot of an operating turbine Unit. This is required to ensure that debris from the VBS does not plug the orifice or enter the juvenile bypass system (JBS) and cause other issues. Additionally, both orifices are only closed for a short amount of time and the turbine Unit is operating at a reduced load.

**Proposed Change**: *Edits to existing FPP text in “track changes”.*

**2.3.2.3. Collection Channel.**

Maintain orifices clean and operating. Operate at least one orifice per gatewell slot (preferably the south orifice). If orifices must be closed to repair any part of the facility, see section 3.2.2.4. to determine if the unit must be shut down and if fish must be dipped from the gatewell(s).

**3.2.2.3. VBSs.** Each gatewell has a VBS located vertically between the bulkhead slot and the operating gate slot to guide fish away from the turbine intake. The VBSs are designed to distribute flow evenly through the screens to minimize fish impingement and/or descaling. The gatewell water surface elevations are routinely measured to determine head differential across the VBSs caused by debris. VBSs are to be pulled and cleaned when head differentials reach 1.5'. Prior to pulling a VBS for cleaning, the turbine unit loading will be lowered to the lower end of the 1% efficiency range, gatewell orifices closed and the gatewell dipped with a gatewell basket to remove all fish present in the gatewell unless doing so results in increased mortality (e.g., high numbers of adult or juvenile shad in gatewells). Immediately after dipping, the VBS shall be raised and debris hosed off. The turbine unit shall remain operating at the lower end of 1% while the VBS is being cleaned so gatewell flow will carry the debris into the operating gatewell where it will pass through the turbine unit. Immediately after cleaning the VBS, the VBS shall be lowered to the normal operating position to prevent fish passing from the bulkhead slot into the operating gate slot and orifices reopened. The VBSs shall not be raised longer than 30 minutes with the turbine unit running. If VBSs cannot be cleaned within 1 workday of the head differential reaching 1.5', the turbine unit loading will be lowered to the lower end of the 1% range until the VBS can be cleaned. If the cleaning frequency of VBSs exceeds Project personnel’s cleaning capability of approximately 10 VBSs per day, 7 days per week, Project personnel will notify CENWW-OD-T. Then CENWW-OD-T will coordinate with NOAA Fisheries and other FPOM participants regarding an exemption to dipping gatewells prior to cleaning VBSs. An exemption to dipping gatewells prior to cleaning VBSs will be based on fish numbers and TDG levels. If a VBS is found to be damaged during an inspection or cleaning, the VBS panel will be repaired or replaced with a spare panel. The turbine unit will not be operated with a known damaged VBS.

**3.2.2.4. Gatewell Orifices.** Each gatewell has two orifices with air operated valves to allow fish to exit the gatewell. Under normal operation, one orifice per gatewell (normally the south orifice) is operated. If an air-valve that operates the orifice fails or the orifice becomes blocked with debris or is damaged, it will be closed and the alternate orifice for that gatewell operated until repairs can be made. If both air-valves that operate the orifices fail and the orifice cannot be fully operated, or must be kept closed, the turbine unit will normally be taken out of service until repairs can be made. At the discretion of the Project Biologist, both orifices in a gatewell may be closed for up to 5 hours in an operating turbine unit with ESBSs in place, but orifice closure times may need to be less depending on fish numbers and condition. Reduce turbine unit loading to the lower end of the 1% efficiency range if deemed necessary by the Project Biologist. If both orifices remain closed after 5 hours, the turbine unit will be taken out of service. During any orifice closure, gatewells shall be monitored hourly (unit is operating) or at least every 2 hours (unit is not operating) by project personnel for signs of fish problems or mortality. If repairs are to take longer than 48 hours and both orifices in a gatewell need to remain closed, juvenile fish will be dipped from the gatewell with a gatewell dip basket in accordance with the project dewatering and fish-handling plan. During times of high fish passage or if there is evidence of any difficulty in holding fish in gatewells, fish are to be dipped from the gatewells prior to the 48 hours in accordance with the project dewatering and fish-handling plan.

**Comments**:

1/27/22 FPOM FPP Meeting:

This was just submitted yesterday so FPOM needs more time to review.

PENDING further review and discussion at the Feb 10 FPOM meeting.

2/10/22 FPOM:

St. John noted that this change corrects the discrepancy between sections. The intent is to make the language clearer and consistent across the projects.

**Record of Final Action**:

Approved for MCN and the four Snake projects at FPOM on 2/10/22.