

Management of Spill for Fish Passage

July 2009

The Corps will continue to manage spill for fish passage to avoid exceeding 120% in the project tailrace, and 115% in the forebay of the next project downstream consistent with the current State of Washington total dissolved gas (TDG) saturation upper limits.¹ These levels are referred to as “gas caps.” The project maximum flow rate or spill discharge level that meets but does not exceed the gas caps, is referred to as the “spill cap.” The gas caps are constant, whereas, spill caps may vary daily depending on flow, temperature, and other environmental conditions.

As noted above, the spill rates presented in Table A are the planned summer spill operations and assume average runoff conditions; however, adjustments to these spill rates may be necessary for the following reasons:

1. high runoff conditions where flows exceed the powerhouse hydraulic capacity with the specified spill rates;
2. navigation safety concerns;
3. generation unit outages that reduce powerhouse capacity;
4. power system or other emergencies that reduce powerhouse discharges; and,
5. A lack of power demand resulting in an increase in the rate of spill.

Spill below the specified rates could also occur during low runoff conditions when meeting minimum generation levels at a project requires reducing spill rates. This would most likely occur in July and August. Minimum generation and spill rates are included below in the project specific information.

The Corps’ Reservoir Control Center (RCC) is responsible for daily management of TDG responsive to changing conditions. In order to manage gas cap spill rates consistent with the States’ TDG saturation limits, RCC establishes the spill caps for each project on the lower Columbia and Snake rivers on a daily basis throughout the fish passage season. These spill caps are set so that resultant TDG percent saturation levels are not expected to exceed the 120%/115% TDG limits, measured as the average of the highest 12 hourly readings each day.

Within any given day, some hours of measured TDG levels may be higher or lower than the gas caps due to changing environmental conditions (wind, air temperature, etc.). The process of establishing daily spill caps entails reviewing existing hourly data at each dam (including flow, spill, temperature, and TDG levels) and taking into consideration a number of forecast conditions (including total flow, flow through the powerhouse, wind and temperature forecast, etc.). This information is used as input into the System TDG (SYSTDG) modeling tool. The SYSTDG model estimates TDG levels in the rivers several days into the future, and is a tool integral to daily decision-making when establishing spill caps at individual dams.

¹ In February 2009, the State of Oregon modified its waiver for 2009 to remove the 115% forebay TDG limit. However, the Corps will continue to manage to 120% and 115% limits (the Washington TDG standard) in 2009.

Spill caps set by RCC in daily spill priority requests will be met at the projects by using the spill pattern in the appropriate FPP spill table which most closely corresponds to the requested spill (i.e. may be slightly over or under). During the freshet when flows are often expected to be greater than hydraulic capacity with the specified spill rates at the dams, or if a lack of power load results in an increase in the spill rate, the Corps will attempt to minimize TDG on a system-wide basis. In this case, spill caps are also developed for 125%, 130%, or 135% saturation to minimize TDG throughout the system. In accordance with the 2009 Spring FOP, spring spill operations commenced on April 3 at 0001 hours for the Corps' lower Snake projects and on April 10 at 0001 hours for the lower Columbia projects. Spill caps have been established at the specified amounts and will continue unless conditions require changing to maintain TDG within the upper limits of 120% in the tailwater of a dam and 115% in the forebay of the next project downstream (and at Camas/Washougal). Spill will transition to summer levels at 2359 hours, or shortly before midnight, at each project just prior to the summer start dates specified.

Operations to manage TDG will continue to be coordinated through the TMT.

Note: Taken from the 2009 Fish Operations Plan, page 1-2.