OVERVIEW OF OPERATIONS
AT PRIEST RAPIDS PROJECT

Mid-Columbia Hourly Coordination

The Priest Rapids Project (PRP) operates as part of the coordinated Mid-Columbia hydroelectric power system. This coordination occurs under the Hourly Coordination Agreement. Hourly coordination attempts to optimize useable power and energy for each project through centralized system dispatch of the seven projects included in the agreement. A party's rights and obligations from or to the coordinated system are based upon their project shares. Auction winners will become parties to the Hourly Coordination agreement through signing a contract joiner amendment. Auction winners will make requests for PRP output to Grant. Requests to Grant will be satisfied by the coordinated operation of the Mid-Columbia system.

Significant Non Power Requirements

Priest and Wanapum are both subject to significant Non Power Requirements (NPRs). These NPRs effect the operation and energy production of the projects. Most of the NPRs are reflected in the capacity and energy numbers computed in the PNCA process.

The area of the Columbia River below Priest Rapids Dam is referred to as the Hanford Reach. This is the only free flowing part of the Columbia River below Grand Coulee Dam, and is spawning ground for salmon. In order to facilitate the spawning, rearing, and transportation of salmon on the Hanford Reach, Priest Rapids must conform to some NPRs that have substantial effects on project operations.

Fish Spill: Both Wanapum and Priest spill water past the turbines for the purpose of enhanced fish passage. The spill quantities have historically varied from 39% to 61% of the total project discharge from April 16 to August 31 of any given year. However, while the amount and duration of the spill can vary from year to year and Grant has worked to decrease the amount of spill through alternative fish passage measures. Expected fish spill requirements for 2012 are 26 KCFS for Priest Rapids Dam and 22 KCFS for Wanapum Dam. Both fish spill programs are expected to begin on 4/15/12 and end during the 3rd week of August 2012.

Reverse Load Factoring: Beginning in the middle of October and continuing for about 5 weeks, the daytime capacity at Priest Rapids is restricted to manage salmon spawning levels and Priest Rapids tends to generate at high levels during the nighttime hours. This mode of operation is opposite to what is generally desired, and this is why the operation is called ***Reverse*** Load Factoring.

It is generally believed that Fall Chinook salmon primarily spawn during the daylight hours. In order to maximize the survivability of Fall Chinook redds in the Hanford Reach, measures are taken to encourage Salmon to spawn at lower elevations in order to

maximize the probability of having enough flow during the incubation period to protect the redds.

During the daylight hours of the spawning period, flows are held as low as practically possible, generally in the 55 kcfs to 70 kcfs range. Since average daily flows generally exceed these amounts, substantially higher discharges occur at night.

A result of this operation is PRP's maximum generating capacity during daylight hours is held to about 800 MW but no nighttime limits on generating capacity are generally required. There are also likely to be pond use limits in place during Reverse Load Factoring to ensure the project can be staged properly during RLF. Specific pond use limits will depend on actual flow at the time.

Protection Level Flows

Following the Reverse Load Factoring Operation, Priest Rapids has higher than license minimum flows during the incubation period, which generally lasts until mid-June each year. The Protection Level flow is generally set and maintained between 60-70 kcfs. This causes Priest Rapids to have higher minimum discharge requirements than the base license minimum discharge level of 36 KCFS.

Rearing Period Operations

Once the salmon hatch on the Hanford Reach, Priest will conduct Rearing Period Operations while the fish are living in the river. The Rearing Period generally lasts from mid March until June.

During the rearing period, the discharge flow band from Priest is substantially limited in order to prevent temporary pools of water from forming along the banks of the river, which cause small salmon to be stranded and possibly die from lack of oxygen. Across each day (24 hour period), the difference between the maximum and minimum hourly average discharge at Priest Rapids Dam is limited to a difference of 20 kcfs to 60 kcfs – actual amount is a function of prior day's Wanapum Dam inflow. Under very high flow conditions (WAN day average inflow above 170 KSFD/D), the daily restriction may be set at a minimum Priest Rapids Dam discharge of 150 KCFS. The impacts of this program are to affect maximum and minimum PRP discharge and pond usage. During this time, the ability to use the PRP for Load Factoring or Load Shaping is restricted.

Total Dissolved Gas Limitations

Throughout the year, the PRP is subject to limitations on total dissolved gas levels, measured as a percent of saturation level. During the high flow / fish migration periods (spring and summer), a waiver allowing increased TDG maximum allowed levels is in place to support fish spill programs. TDG concentrations are a function of spill level, ambient air temperature and water temperature and are difficult to forecast. TDG maximum allowed levels place an upper limit on the amount of water that can be spilled

at the PRP. During most of the year, this limit does not affect operations. During the warmer and higher flow months – late spring and summer, it can become a limiting factor in PRP operations. The impact on an auction winner from TDG is that it can limit the amount of water spilled and therefore raise the required minimum generation levels at the PRP. A historical overview to PRP TDG limits and historical data can be found at:

http://www.gcpud.org/naturalResources/fishWaterWildlife/waterQuality.html

Ad Hoc Requirements

Additional Ad Hoc non power requirements included such things as maintaining particular flows for downstream activities such as barge transportation, recreation requirements or maintenance. Construction projects can also limit hydro operations by requiring certain flows and forebay elevations. In particular, pond use limits for recreation will be in place from 8:00 AM the Friday prior to each of Memorial Day and Labor Day through 8:00 AM the Tuesday after each of these holidays. Also, for Independence Day pond limits will be in place from 8:00 AM 7/3/12 through 8:00 AM the 7/5/12. The recreation pond limits require PRD elevation to remain above ~486.0' and WAN elevation to remain above ~567.5'. No other known pond limits are known at this time.