

Federal Hydro IPR 2 Webinar Notes

Fed Hydro Capital:

- Is there any consideration when analyzing overhauls and uprates if the units are actually still needed on the system? The system operates much differently today compared to 30 or 40 years ago and rarely reaches generating at more than 60 percent of installed capacity during peak times. Has Grand Coulee generated more than 4,500 MW in the last 5 years?
 - As major reliability improvements are planned for units across the system, the benefits and costs of efficiency and capacity gains are investigated. Efficiency and Capacity improvements are pursued if the benefits outweigh the costs.
 - Efficiency improvements are calculated using BPA's GARD model which simulates unit deployment at various monthly water conditions from an 80 water year record.
 - For example, at Ice Harbor, the Corps is only replacing three out of the six units. The determination of what units need work is done on a plant by plant basis.
 - Repairs or replacements are not necessarily capacity driven but there is also a need to look at authorized purposes like flood management so that plants still have the ability to control the amount of water coming through.
 - Capacity at Grand Coulee is limited not only by low availability from unit outages, both planned and unplanned, but also by changes in flow and water elevation throughout the year. Although the plant has a nameplate capacity of 6735 MW, it's usable capacity considering unit outages and water conditions averaged 4208 MW over the last 5 years.
- Can the federal agencies mothball some of these units that don't pencil out anymore? Is there somebody that can make that decision? It seems that this may need to be authorized by Congress.
 - The Corps periodically evaluates whether a feature or specific function of a project needs to continue. There would be a study to determine if the function is needed and if it were not needed there would be a proposal to de-authorize the function. A team would review the proposal and run it through a group in Washington D.C. The final step would be having Congress approve the de-authorization of the function.
 - The new System Asset Plan process does attempt to capture the mitigated environmental risk associated with equipment replacement. Investments that reduce environmental risk are compared against investments that reduce lost generation and safety risks in a portfolio optimization model that optimizes investments to maximize portfolio value. Safety and Environmental benefits are weighted more heavily than generation in the model to give them increased standing.
- The lost generation risk is considered but what about the outage consequence for environment? For example, in May 2011 a transformer failed and had the consequence was a number of sockeye died off.
 - The Hydro Asset Strategy evaluates the risk of lost generation and direct costs resulting from equipment failure. Certain equipment is identified as posing a high environmental or safety risk as their condition declines. These pieces of equipment are flagged for replacement consideration by the asset strategy when they cross into the high risk category of the Environmental or Safety risk map. The actual environmental impacts, however, are not evaluated in the strategy. These impacts are, however, captured in the System Asset Plan.
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- The lost generation risk is 13 percent of the system in an average water year with expected values. With the costs explained for an average water year on slide nine, how does this compare under critical water?
 - The chart shown on slide 9 would not make sense if the model was run under critical water for all years in the study period as critical water is a rare occurrence. In reality, some years would have considerably higher impacts than in average water conditions and some would

This information was made publicly available on Dec. 23, 2016, and contains information not sourced directly from BPA financial statements.



have considerably lower. Certainly in critical water years, the differences in lost generation between the two investment plans would be minimal. In wet years however, the differences would be even more pronounced.

- What is the status of the third unit work at the Black Canyon Dam? (Don't see how it could pencil out given current power prices). What is the timing associated with a final decision?
 - Reclamation is still evaluating the merits of that project. They still need to look at the financials to determine if it's a viable project. The analysis will look at investments in the current structure along with the expense of the construction upgrade.
 - There should be a firmer plan available in the spring or summer of 2017.
 - There is additional reliability work planned at Black Canyon Dam in 2017 which is included in the planned investment numbers on slide 12.
- BPA completed an analysis of different investment levels between \$200 million and \$300 million for the capital program. More information is included in the federal hydro asset strategy posted on the IPR website.
- How does the computer model place priority on different categories in the ranking of projects? Can we follow up on specifics?
 - In a beta test, BPA entered 60 projects comprised of a mixture of safety, environmental and lost generation risk driven investments. The test showed that environmental and safety rankings did not drive projects as had been expected. These categories are weighted more heavily in the current version. But the ultimate weighting does not rely only on the computer; the output is just the start of the development of the System Asset Plan. Human input is what drives the final System Asset Plan so environmental concerns could change project priorities in finalizing prioritization.

Fed Hydro Expense:

- The expense per megawatt hour on slide 3 includes BPA fish and wildlife expenses funded in the system. The Corps and Reclamation points only include projects in the FCRPS.
- The only cheaper utility on slide 3 has a large portion of capacity tied up in facilities that are 30 years old or less.
- Some public power utilities have not increased their work force and in fact have reduced due to technological advances or jobs becoming obsolete. What are you doing to make sure you have the most efficient workforce?
 - In 2012, Reclamation completed a staffing study at Grand Coulee Dam to ensure the correct jobs are accounted for and that they are appropriately allocating resources both now and into the future. The study identified several areas where implementing industry best practices would require over 100 additional staff, including asset management, project management, non-routine maintenance, and O&M engineering support. One benefit was better management of the maintenance program to reduce costs by standardizing job plans and maintenance procedures. After careful review and study of critical needs, Reclamation developed a staffing plan which included 43 additional positions which were added in the 2012 IPR for the '14-'15 rate period.
 - Grand Coulee had been understaffed so the addition of jobs brought employment levels back up to operating levels to get through a backlog of work. There have been other areas in the system that have seen some downsizing.
 - The Corps is current completing a national maintenance improvement plan which is reviewing all work on assets. It is in its infancy stage where analysis is underway. The plan will allow the Corps to have a better handle on where to concentrate work and where it could reduce costs over time.
 - Corps and Reclamation are currently working with their HR departments to see if more detail on this question can be provided.