Upper Columbia UPDATE

THE NEWSLETTER OF THE UPPER COLUMBIA ALTERNATIVE FLOOD CONTROL AND FISH OPERATIONS ENVIRONMENTAL IMPACT STATEMENT (EIS)

ISSUE #6 — WINTER 2005

In this issue . . .

We have published five newsletters to inform you of the progress on the Upper Columbia Alternative Flood Control and Fish Operations Environmental Impact Statement (also known as the VARQ EIS). This 6th edition is intended specifically to summarize results of the hydrologic analysis at Hungry Horse and Libby Dams and hydropower analysis of the Columbia River coordinated hydropower system.

The 7th newsletter will be timed to come out during the public review period for the draft EIS later in 2005, and will focus on the overall document and the comment process. The 8th and final newsletter will be geared toward the wrap-up of the EIS and our decision on future project operations.

The EIS will evaluate four alternatives that combine different operations at Libby and Hungry Horse dams:

At Hungry Horse Dam:

- Standard Flood Control (FC) with fish flows*
- VARQ FC with fish flows

*At Libby Dam**:*

- Standard FC with fish flows including sturgeon flows up to current powerhouse capacity
- VARQ FC with fish flows including sturgeon flows up to current powerhouse capacity
- Standard FC with fish flows including sturgeon flows up to 10,000 cubic feet per second (cfs) above current powerhouse capacity
- VARQ FC with fish flows including sturgeon flows up to 10,000 cfs above current powerhouse capacity

**Fish flows include bull trout minimum flows and salmon augmentation at Hungry Horse Dam and bull trout minimum flows, salmon augmentation and sturgeon flows at Libby Dam.*

***The impacts of the Libby fish flows will be evaluated by comparing EIS alternatives to operational scenarios without fish flows.*

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Simulation of Local Effects of Alternative Flood Control Operations at Hungry Horse Dam, Montana

Reclamation has completed a hydrologic analysis, using computer modeling, for alternative operations at Hungry Horse Dam. The analysis shows that impacts to reservoir elevations and discharges at Hungry Horse Dam and at projects downstream to below Albeni Falls Dam are minimal when comparing VARQ FC to Standard FC.

VARQ FC is intended to reduce the seasonal flood control draft without compromising system-wide flood control protection. If the amount of water that is normally stored during the refill period is passed through the project, then the amount of storage space needed in the project is reduced. Typically the May 1 water surface elevation at Hungry Horse will be higher with VARQ FC than Standard FC in years when forecasted project inflows are less than 130% of average. In years where forecasted inflows are greater than 130% of average,

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DEFINITIONS IN THIS ISSUE

Variable flow (Q), or VARQ flood control: An alternative flood control operation whereby a storage reservoir is lowered less in winter during years with a low or medium runoff forecast.

Standard Flood Control (also referred to as BASE-CRT63): The flood control protocol proposed for long-term replacement by VARQ flood control for Libby & Hungry Horse dams.

Flood Control Draft: Releasing water from the dam to lower the reservoir elevation, typically when reservoir inflows are low. The lowered reservoir then has storage space to capture water when necessary to help control downstream flows during high runoff events caused by rainfall and/or snowmelt.

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Hungry Horse Reservoir would be at similar elevations for both Standard FC and VARQ FC.

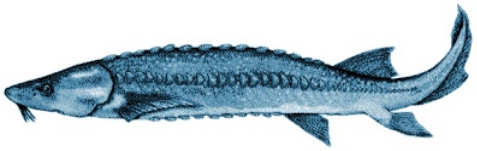
Refill probabilities are slightly higher at Hungry Horse Reservoir and at Flathead Lake under VARQ FC compared to Standard FC. Flathead Lake elevation remains up to six inches higher for several weeks in the summer during below-average water years under VARQ FC.

The discharges from Hungry Horse Dam under the VARQ FC rule curves are generally higher in May and June and lower in April when compared to Standard FC. This same pattern is also true at Flathead Lake and Albeni Falls Dams where flows are slightly higher in June and slightly lower in April under VARQ FC.

Limitations in capacity to transmit electricity, which are summarized in more detail in the full report, could result in increased spill at Hungry Horse due to VARQ FC. Increased spill causes subsequent increases in total dissolved gas saturation. Consequently occurrences of total dissolved gases exceeding 110% saturation (Montana State maximum standard under the Clean Water Act) could be increased below Hungry Horse Dam under VARQ FC.

There is no difference between Standard FC and VARQ FC in the probability of exceeding flood stage at Columbia Falls. There is no increase in the occurrence of flooding on the Flathead River at Columbia Falls, Montana under VARQ FC. Below flood stage, Flathead River flows are slightly higher for VARQ FC. VARQ FC resulted in slightly lower flows in the Pend Oreille River below Albeni Falls Dam during the March-April time period when flooding at Cusick, Washington due to local inflows is a concern. Flows in the Pend Oreille River below Albeni Falls Dam are slightly higher in June under VARQ FC, but the frequency of exceeding the flood warning threshold of 100,000 cfs is essentially the same for VARQ FC and Standard FC.

Additional details may be found in the Hungry Horse report available at: http://www.usbr.gov/pn/programs/VARQ/links.html



Simulation of Local Effects of Alternative Flood Control and Fish Operations at Libby Dam, Montana

The Corps conducted a hydrologic analysis using computer modeling for alternative operations at Libby Dam. The analysis simulates how those operations affect flows, river levels, and reservoir/lake elevations at Libby Dam, Bonners Ferry, and Kootenay Lake.

Results show that VARQ FC improves reservoir refill compared to the corresponding Standard FC operation, but fish flow operations decrease the annual maximum reservoir elevation and refill percentage. In near-average-runoff years, peak Libby Dam outflows during refill in the spring and summer are generally greater with VARQ FC than they are with Standard FC. As peak outflows approach the powerhouse capacity (about 25,000 cfs), outflows under VARQ FC and Standard FC outflows are similar. This is because draft requirements are the same for VARQ FC as for Standard FC in high runoff years. In all simulations, the maximum outflow from Libby Dam remained below 40,000 cfs. In general, the peak outflow from Libby Dam increases as a result of sturgeon flows and as the peak sturgeon flow increases.

In most years at Bonners Ferry, VARQ FC results in higher river stages than the

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PUBLISHING INFORMATION

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Standard FC procedure. However, Bonners Ferry river stage in the high runoff years is similar under both VARQ FC and Standard FC since simulated and actual water management for flood control limits Bonners Ferry stage to 1764 feet, when possible. With VARQ FC, the modeled likelihood of peak Bonners Ferry elevations between 1764 and 1765 feet is about 1% higher than with Standard FC. But the likelihood of exceeding a peak Bonners Ferry stage of 1765 feet is equal for both operations. When compared to without-fish-flow scenarios, fish flows cause an increase in peak stage and duration at river levels below flood stage at Bonners Ferry, with sturgeon flows at 10,000 cfs above current powerhouse capacity showing the greatest increases.

Kootenay Lake tends to be higher under VARQ FC than Standard FC. Sturgeon flows tend to increase the peak level of Kootenay Lake between one and three feet, depending on the flood control method (standard or VARQ) and type of sturgeon flows provided (limited to powerhouse capacity or to 10,000 cfs above current powerhouse capacity).

To complete this modeling, many assumptions regarding real-time operations were made, including water supply forecasts, sturgeon operations and operational decisions. The study included an analysis of how sensitive the results were to these decision criteria used in the computer models. The sensitivity analysis indicates that the modeling has captured the upper bounds of impacts to river flows and stages.

Additional details may be found in the Libby report available at: http://www.usbr.gov/pn/programs/VARQ/links.html

Simulation of Multipurpose Operation of the Columbia River Hydropower System

Using computer modeling, the Corps conducted a study that simulates the operation of Federal, private, and public utility dams that make up the Columbia River basin's coordinated hydropower system. The study evaluated impacts of flood control and fish operations at Libby and Hungry Horse dams on hydropower generation, Grand Coulee Dam operations, and mainstem Columbia River flow targets for salmon.

Comparing the impacts of the two flood control operations, VARQ Flood Control (FC) and Standard FC (both including fish flows at Libby Dam), the model showed the following:

Power impacts: Results indicate that although the average individual monthly generation could be reduced by as much as 4% with VARQ FC, the average annual system generation would decrease by less than 0.1%, or about 7 average megawatts. VARQ operations tended to increase system power generation from May through August and decrease system power generation from January through April.

Impacts to Grand Coulee reservoir elevation: Grand Coulee Dam, in coordination with Libby, Hungry Horse, and other dams in the U.S. and Canada, is operated to provide flood protection at The Dalles and Portland, Oregon. Available space at upstream dams can affect flood control space requirements at Grand Coulee. On May 1, Grand Coulee is drafted from 0 to 6 feet deeper due to implementation of VARQ FC at Libby and Hungry Horse. There would be no difference in draft at Grand Coulee in 24 out of 52 years.

Impacts to salmon flow targets: Spring and summer flow targets at McNary Dam were achieved more frequently with VARQ FC, but the likelihood of meeting flow targets at Priest Rapids Dam was not substantially affected.

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NOW ON THE WEB

For the latest news and information on the UC project, go to

www.usbr.gov/pn/programs/VARQ

Listed below are just a few of the informative articles and documents you'll find on the website:

- **Monthly Forecast Updates**
  Monthly updates of water supply forecasts, flood control target elevations based on those forecasts, and current reservoir elevations for Libby, Hungry Horse, and Grand Coulee.
- **Technical Study Reports**
  Postings of reports on the various technical studies being done to support the EIS evaluation.
- **Frequently Asked Questions**
  Answers to a number of questions about the project covering technical issues, policy, background, and process.

Plus links to:

- Agency websites
- Articles and reports on Columbia and Kootenai River dam and flood control operations
- Information on endangered species
- Alternative perspectives and viewpoints

Any Missing Links?

If there are any links you think would add to the information on our site, please submit them to:

uceis@usace.army.mil

Thanks for your input!

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In addition to comparisons between the two flood control alternatives (which both included implementation of fish flows at Libby), this study also looked at changes specifically due to the fish flows themselves at Libby Dam. The basic results were:

Power impacts: The average annual generation of the Columbia River power system was decreased by less than 1% due to the implementation of fish flows at Libby Dam. Under Standard FC, Libby fish flows resulted in monthly generation increases in the spring of 1% to 3%, and decreases in September of about 13%. Under VARQ FC, Libby fish flows resulted in monthly generation increases of 1% to 5% from May to August, and decreases of about 13% in September.

Impacts to Grand Coulee reservoir elevation: Implementation of fish flows at Libby Dam did not affect Grand Coulee water surface elevations on May 1.

Impacts to salmon flow targets: Flow targets at McNary Dam were more likely to be met in May through August with Libby fish flows added to either VARQ FC or Standard FC. Priest Rapids flow targets were more likely to be met in May and June for Standard FC with Libby fish flows, but were equally likely under VARQ FC regardless of fish flow implementation.

Hydropower generation data from this study will be used to assess anticipated economic impacts. The economic impacts report is scheduled for completion in the next few months.

Additional details may be found in the final hydropower impacts report located at: http://www.usbr.gov/pn/programs/VARQ/links.html

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