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January 7, 2003

MEMORANDUM

TO: Council Members

FROM: Bruce Suzumoto

SUBJECT: Staff recommendation on the Federal Columbia River Power System (FCRPS) action agencies' proposal regarding removable spillway weir construction

Issue

The FCRPS action agencies (Bonneville, Corps of Engineers and Bureau of Reclamation) are proposing to accelerate the process for the installation of removable spillway weirs (RSWs) at Ice Harbor Dam. RSWs may provide significant fish and power benefits but the technology has not been adequately tested at mainstem dams. Where feasible, the action agencies would like to test and install RSWs as soon as possible because of the potential cost savings and fish survival benefits. In order to complete installation of the Ice Harbor Dam RSW by FY 2005, the Corps must initiate testing in FY 2003.

Background

The FCRPS action agencies are proposing changes to hydro operations and the implementation schedule of certain project configurations in 2003. The details of the hydro operations and configuration changes are outlined in the December 12, 2002 Council memo by John Shurts (Attachment 1). The Council planned to review these proposals early in 2003, and make recommendations to the action agencies following that review. The Council was informed that in order to meet 2003 deadlines, the action agencies needed to make a decision by the end of January on RSW schedule changes, by February on the chum/April 10 operations and by March on the spill decisions.

The issue under discussion here pertains to the proposed acceleration of the testing and construction of an RSW system at Ice Harbor Dam. To better understand the issue the Council requested that the action agencies answer several questions pertaining to accelerating the schedule for RSWs at Ice Harbor. The questions and the action agencies' responses were as follows:

Q1. What would acceleration mean, in terms of what work would take place in 2003, 2004 and 2005 that was not on the schedule? What would the Corps budget impacts be?

A. The Corps had anticipated initiating development of RSWs at Lower Snake River sites in FY 2003. An amount of $250,000 was planned in the original FY 2003 budget to investigate RSW development at Lower Snake dams. When Ice Harbor was identified as a good candidate where power costs and fish survival could be improved, it was proposed that the development of an Ice Harbor RSW be accelerated by approximately one year. In order to meet testing and construction schedules for an RSW at Ice Harbor, the FY 2003 budget would have to be increased by approximately $750,000. A detailed budget has not been estimated beyond 2003, however a budget of $5 million was established for all design and engineering during construction through FY 2006. General schedule is as follows;

Pre-construction biological evaluations: **Spring 2003 and 2004**
Complete RSW pre-design/scope development: **September 2003**
Detailed design RSW P&S: **March 2004**
Construction/installation (RSW): **March 2005**
Initiate behavioral guidance structure (BGS) design: **November 2003**
Detailed design (BGS) P&S: **March 2005**
Construction/installation (BGS): **March 2006**

Biological testing: **Spring 2005 and 2006**

The total RSW construction costs at Ice Harbor are estimated to be $16.3 million. The biological evaluations, pre and post construction costs are estimated to be $5.5 million. The costs do not include costs to design and construct behavioral guidance structures for planned implementation in FY 06.

Q2. What would the implications of acceleration be for other work -- that is, what work, if any, would have to deferred to be able to accelerate the preferred actions?

A. Given that Congress has not approved a for FY 2003, the impact on other work cannot be truly determined. However, assuming an approved budget in the range of $85-87 million (by historical standards a reasonable estimate), it appears that the additional $750,000 needed in FY 2003 can be accommodated in the program without impacting other work already planned for this year. In 2004 and out, assuming positive research results supporting RSW construction is seen, the impact on other measures will again depend on the actual budget (the President's '04 budget will not be released until February). It is conceivable that a number of currently lower priority measures in the list (the SCT priority list) would need to be deferred to accommodate the $8-10 million required in FYs 04 and 05 for construction. What would actually be deferred would be coordinated through the Regional process.

Q3. In more detail than the Council has seen so far, what biological information provides a reason for accelerating these items?

A. There is limited data to respond to this in detail. The tests conducted at Lower Granite in the spring of 2002 did not compare survival. Survival comparisons are planned for the spring of 2003 at Lower Granite that should provide data on RSW passage survival compared with conventional spill passage survival. The tests at Lower Granite measured the overall passage performance to determine the effectiveness and efficiencies for passage. The data showed the RSW passage route is much more efficient than conventional spill and that fish found the passage route quickly and passed over the dam, especially during the day, compared to conventional spill. In addition, juvenile fish passed the project and experienced less delay at the dam by utilizing the RSW passage route. Any benefits of installing an RSW and BGS at Ice Harbor are speculative in nature at this time, however spillway survival tests planned for FY 2003 should resolve if continued acceleration is warranted.

Q4. If we have a low flow year in the Snake, will that affect the decision on whether to accelerate the schedule for the Snake RSWs (and if so, why)?

A. Low flows could effect the ability to conduct a test, or reduce data reliability. Tests conducted under substantially less than normal river conditions may compromise the data and make decisions on future implementation more difficult.

Q5. What are the potential savings in energy and costs from accelerating the installation of these devices?

A. The operational cost savings were estimated by Bonneville to be $12 million per year. The cost savings ranged from $4 to $21 million per year when computed over a 60 year average flow calculation.

Discussion

Spillway survival at Ice Harbor Dam may be much lower than originally anticipated. Testing completed in 2002 indicates that juvenile passage survival via spillways under current operations is about 88 to 90% for summer and spring migrants. This is much lower than the 98% spillway survival originally assumed. Currently, alternate passage routes, spill levels and tailrace egress methods are being explored.

RSWs may be one way to provide juvenile survival benefits that are as good or better than existing 2000 Biological Opinion spill levels. While the benefits of installing a RSW system at Ice Harbor are still speculative, preliminary tests at Lower Granite Dam show promising results. An RSW system at Ice Harbor with lower spill levels may provide relatively high spillway passage, improve tailrace egress and lower total dissolved gases.

According to the Corps, accelerating the schedule for the installation of an RSW system will most likely not have an adverse impact on other projects currently scheduled for work in FY 2003. They believe that the $750,000 cost for preliminary RSW design and engineering can be accommodated within the current year's budget without affecting other planned projects.

The operational cost savings from reduced spill levels is estimated at approximately $12 million per year. Potentially these savings could occur starting in FY 2005 when an RSW at Ice Harbor becomes operational.

Overall, acceleration of the schedule for the installation of a RSW at Ice Harbor makes sense because it attempts to increase fish and wildlife benefits while reducing operational costs. The RSW could improve spillway fish survival at Ice Harbor and assist Bonneville in meeting its financial obligations. However, RSWs are still unproven and should be approached with caution. Before actual construction of an RSW system begins it should be thoroughly tested and evaluated.

Recommendation

The staff recommends that the Council endorse the FCRPS action agencies' proposal to accelerate the first year of testing, design and engineering of a RWS system at Ice Harbor Dam with the provision that all information collected during the pre-construction biological evaluations be thoroughly reviewed and discussed in the Regional Forum process before a decision is made to continue with construction of the RSW.

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January 7, 2003

MEMORANDUM

TO: Council Members

FROM: Bruce Suzumoto

SUBJECT: The Federal Columbia River Power System (FCRPS) action agencies' proposal regarding operational changes for chum salmon

Issue

The FCRPS action agencies (Bonneville, Corps of Engineers and Bureau of Reclamation) are proposing to prioritize operations to protect chum spawning habitat below Bonneville Dam over meeting the April 10 flood control rule curve.

Background

The FCRPS action agencies are proposing changes to hydro operations and the implementation schedule of certain project configurations in 2003. The Council was informed that in order to meet 2003 deadlines, the action agencies needed to make a decision in February on whether or not to prioritize hydro operations for chum salmon over the April 10 flood control operations.

During the fall, ESA listed chum salmon spawn in tributaries and mainstem areas below Bonneville Dam. The fish deposit their eggs at different elevations depending on the river conditions at the time of spawning. The eggs must be kept moist, well oxygenated and protected from freezing temperatures in order to survive. Chum redds can be protected by ensuring that water levels are sufficiently high to adequately cover the chum spawning grounds. The redds at the greatest risk are ones located at higher elevations because they can be exposed when water levels drop or fluctuate. By relaxing the April 10 flood control target and increasing river flow in some years (which raises water levels), chum redds in the lower river may be given greater protection and possibly increase overall fish survival.

To better understand the issue the Council requested that the action agencies answer several questions pertaining to the proposed operational changes. The questions and the action agencies' responses were as follows:

Q1. Under what water conditions would these operations take place?

A. The proposal is to attempt to maintain a monthly average flow of at least 125 kcfs at Bonneville Dam from January through March in all water conditions.

Q2. What would be the physical gain for the chum spawning/rearing conditions?

A. From our analysis we expect the number of years when the flows would be at least 125 kcfs (month average) from January through March would increase from 34 in the 2000BO study to 40 (of the 50 historical water conditions we model). The 125 kcfs can't be met in all 50 years in the study because reservoir draft to meet the target is stopped when a reservoir reaches it's 95% confidence of refill by June 30 level.

Q3. What would be the magnitude of the deviations from the April 10 target elevations? What would the impacts be on winter and spring flows?

A. We expect the deviations from mid-April flood control targets would increase in number from 21 in the 2000BO study to 28 with an increase in the average miss of 23 ksfd (two to three feet) at Hungry Horse. At Grand Coulee the deviations would increase from 7 to 31 years with an average increase in the miss of 43 ksfd (one to two feet).

Q4. What information is there on the biological trade-offs -- impacts to spring salmon migration? benefits to chum? benefits to chinook spawning and rearing in the same area? Power system/cost impacts?

A. We expect the proposal to increase federal system average annual generation by 41 MW. Most often the increase occurs in the months of February, March and the first half of April. The fifty-year average annual increase in revenues is about $3 million with a range from a loss $44 million to a gain of $49 million). It is worth noting that the years in which revenue losses occurred are the higher flow years when BPA revenues overall are highest and the years that showed the largest gains in revenue are the lower flow years when additional revenues could help the most.

Discussion

No Council action is requested at this time. The action agencies will present additional information and discuss this issue in greater detail at the Vancouver Council meeting.

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December 12, 2002

MEMORANDUM

TO: Council Members
FCRPS Action Agency Representatives
and Other Interested Persons and Entities

FROM: John Shurts

SUBJECT: FCRPS action agencies' proposals regarding mainstem operations and system configuration in 2003
- procedure and timing for Council review
- categories of information relevant to review of the proposals

Introduction

The Federal Columbia River Power System action agencies (Bonneville, the Corps and Reclamation) have asked the region to consider a set of changes to hydro operations for 2003 and to consider accelerating the schedule for certain system configuration changes. The Council is planning a public review of these proposals early in 2003, and may make recommendations to the action agencies following that review. The purpose of this memorandum is to outline the proposals, describe the procedure and timing for the Council's review, and outline the kinds of information about the proposals that the Council staff requests the action agencies to provide (and that others may wish to comment on, too) to assist the Council in undertaking its review.

List of changes proposed

2003 Operations

- eliminate spill for the March Spring Creek Hatchery release
- subject to review of daytime spill test data, eliminate spring daytime spill at John Day Dam
- test alternative spring nighttime spill at John Day below the BiOp level of 60% of the flow
- evaluate spill levels at Ice Harbor Dam both spring and summer to optimize tailrace egress and project passage survival
- explore chum operation as priority over meeting the April 10 flood control rule curve in some water conditions

Acceleration of system configuration changes

- Ice Harbor -- accelerate schedule for 2005 installation of removable spillway weir and guidance system; then modify spill
- Lower Monumental -- accelerate schedule for 2006 installation of removable spillway weir and guidance system; then modify spill

- The Dalles -- accelerate schedule for 2005 installation of forebay physical guidance device; then modify spill

The action agencies will be pursuing these proposals this winter and spring within the "Regional Forum" for considering annual and in-season operations -- TMT, SCT, IT, etc. The System Configuration Team will be the focal point for consideration of the system configuration items. We have been told that the Corps would need to make a decision by the end of January of 2003 if it is going to accelerate the schedules for the system configuration items. The Technical Management Team (TMT) will be the focal point for deciding on revisions to spill and flow levels, although study design review groups will also have an input. The spill decisions need to be made by March; better if earlier. The chum/April 10 operations issue apparently will need to be decided by February.

Procedure and timing for Council review

- **Council meeting, January 14-15 (Vancouver):** The Council will review and possibly make a recommendation regarding the proposal to accelerate the removable spillway weir and forebay device installation schedules. The Council *may* review and make a recommendation regarding the proposal concerning the relative priority of the chum operation vs. the April 10 flood control target in low water conditions (or it may defer that proposal to the February meeting, depending on what information is available and when the decision must be made). On or about Wednesday, January 8, 2003 (that is, the week before the meeting), the staff, working with the action agency representatives and others, will organize relevant information on these proposals for the Council and produce a decision memorandum for the Council and others to review.

  During the January meeting then, the Council will review the information on these proposals, entertain comments from interested parties, and may decide at that time (a) to endorse the proposals; or (b) to oppose the proposals, or (c) that more information is needed before a decision by the Council and others should be made on these proposals; or (d) that the Council should defer its consideration of these proposals to another time or completely to the mainstem program amendment process. If the Council perceives that it is able to delay a recommendation to the action agencies on these matters until February, the Council may issue a draft set of recommendations at the January meeting for public review and comment, and then finalize the recommendations at the Council's February meeting.

- **Council meeting, February 18-20, 2003 (Portland):** The Council will review and possibly make recommendations regarding the proposals for 2003 spill operations (and for the proposal to prioritize chum operations over the April 10 elevation target, if the Council has deferred this issue from the January meeting). Again, about a week before the meeting, the staff, working with the action agency representatives and others, will organize relevant information on the proposals for the Council and produce a decision memorandum for the Council and others to review. At the meeting, the Council will review the information, hear the views of interested entities, and decide how to proceed.

  The Council will have the same set of options for action on the spill proposals as on the other proposals (that is, to endorse, oppose, need more info, or defer consideration completely to the mainstem amendment process). But at least for some of the proposals, there may be time for the Council to produce a set of *draft* recommendations for public review and comment, with a final decision on recommendations at the March meeting.

Categories of information relevant to review the proposal

For each proposal or related set of proposals, there are categories of information that staff requests that the action agencies provide if possible, as important to helping the Council undertake an informed review of the proposals. Others may wish to provide information or comment on these questions, too. The information needs include:

Acceleration of system configuration changes

- What would acceleration mean, in terms of what work would take place in 2003, 2004 and 2005 that was not on the schedule? What would the Corps budget impacts be?
- What would the implications of acceleration be for other work -- that is, what work, if any, would have to deferred to be able to accelerate the preferred actions?
- In more detail than the Council has seen so far, what biological information provides a reason for accelerating these items?
- If we have a low flow year in the Snake, will that affect the decision on whether to accelerate the schedule for the Snake RSWs (and if so, why)?
- What are the potential savings in energy and costs from accelerating the installation of these devices? (The Power Division staff will independently analyze the potential energy/cost savings.)

Prioritizing chum operations over meeting April 10 flood control target elevations

- Under what water conditions?
- What would be the physical gain for the chum spawning/rearing conditions?
- What would be the magnitude of the deviations from the April 10 target elevations? What would the impacts be on winter and spring flows?
- What information is there on the biological trade-offs -- impacts to spring salmon migration? benefits to chum? benefits to chinook spawning and rearing in the same area?
- Power system/cost impacts? (Power Division staff will independently analyze.)

Eliminate spill for March Spring Creek Hatchery Release

- What information indicates that spill survival for these fish is no significant greater than turbine survival for these fish through Bonneville Dam, as action agency representatives have stated?
- What is the relative contribution of this release to adult returns and harvest?
- Is there a relationship between re-programming production and release of these fish and a decision to eliminate spill?
- Power system/cost impacts? (Power Division staff will independently analyze.)

John Day and Ice Harbor spill changes

- Precisely what different spill levels will be evaluated at Ice Harbor and for nighttime spill at John Day?
- In some detail, what is the biological information (and what were the study designs) that indicates that reducing the spill levels at Ice Harbor and John Day may not adversely affect and may actually benefit migrants, the premise that seems to underlie the proposal?
- Same biological question for the proposal to eliminate daytime spill at John Day?
- Power system/cost impacts? (Power Division staff will independently analyze.)

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