OPERATING STANDARDS & MAINTENANCE PLAN 1986

NPP (w/ notes)

I. Bonneville Dam

A. Adult Fish Passage System

1. Fish Passage Season - March 1 through November each year operate according to criteria in Appendix B.

2. Winter Maintenance Season - December 1 through February each year operate according to criteria in Appendix B.

3. Fishway Auxiliary Water Systems

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - Bonneville Project auxiliary water systems consist of gravity flow and generating systems. Preventive maintenance and normal repair are carried out throughout the year.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures) - Most fishway auxiliary water systems are operated automatically. If the automatic system fails the system can usually be operated manually by project personnel. This will allow the fish facility to operate according to criteria while repair of the automatic system is carried out. When this operation becomes necessary project personnel will increase the surveillance of the adult system to ensure that criteria are being met.

Bonneville First Powerhouse - If any of the valves or any other part of the system fails, the project is to attempt to maintain criteria by adjusting those valves which continue to function. Conduit pressures must be monitored and not allowed to exceed the established limits. If this maneuver fails to keep the facility operating according to the adult fishway criteria and repairs cannot be made within 24 hours then close powerhouse entrances (9, 21, 34, 58 and 62) one at a time starting with gate 9 and proceed north.

If closing the orifice gates fails to achieve a minimum fishway head of 1.2 feet when tailwater is greater than 17 feet then raise gate 65 weir in one-foot increments up to 6 feet of depth below the tailwater surface. If this fails to achieve the proper fishway head criteria, then raise gate 1 weir in one-foot increments to 6 feet of depth below the tailwater surface.

When tailwater elevation is less than 17 feet and the gate 65 weir crest is at least 6 feet below tailwater, close gate 64 in one-foot increments until the proper head is achieved or the gate is fully closed, then raise gate 65 in one-foot increments up to 6 feet below tailwater. If the gate 65 weir crest is less than 6 feet below tailwater, fully open gate 64 and close gate 65. If this fails to achieve the proper fishway head and the gate 1 weir crest is at

least 6 feet below tailwater, close gate 2 in one-foot increments until fully closed, then raise gate 1 in one-foot increments up to 6 feet below tailwater. If the gate 1 weir crest is less than 6 feet below tailwater, fully open gate 2 and close gate 1. At this point maintain the gates position regardless of whether criteria are met or not, until the auxiliary water system is repaired.

Bonneville Spillway - Two separate fishway auxiliary water valves add water to each spillway ladder (Cascades Island and B-Branch ladders). If one of these valves or any other part of the system malfunctions, the functioning parts of the system are to be adjusted to compensate. If repairs cannot be made in 24 hours, close the sluicegate entrance, if open. This will divert the reduced available water to the entrance slots. If a head of 1.0 foot is still not achieved, stoplogs are to be added to the entrance slots until the desired head or a weir depth of not less than 6 feet below the tailwater surface is reached. At this point maintain the gate positions until the auxiliary water system is repaired.

Bonneville Second Powerhouse - If either of the fishway auxiliary water turbines are unable to provide water sufficient to meet full criteria, raise the North Upstream Entrance (NUE) in one-foot increments until the weir crest is 6 feet below the tailwater or a fishway head of at least 1.2 feet is achieved. If this fails to achieve the above criteria then apply the same procedure, until the criteria is achieved, using in addition the North Downstream Entrance (NDE) then, the South Upstream Entrance (SUE), and finally the South Downstream Entrance (SDE). The weir crests for these three entrances should not be raised above 8 feet below tailwater. If the correct fishway head criteria is still not achieved after this procedure, then fully close NUE and operate in this configuration until repairs can be made to the system.

If both of the fishway auxiliary water turbines fail, the backup fishway auxiliary water system, using gravity flow through the ice and trash sluiceway, will be started up. The adult facility will be operated as follows: (1) Close NDE, SUE and NUE; (2) Operate the SDE weir crest at eight feet below tailwater; (3) Operate the floating orifice gates. However, if the backup fishway auxiliary water system must be used for a period exceeding 30 days, then block off as many of the center floating orifice gates as possible and open NDE with a weir depth of eight feet below the tailwater water surface. While under this configuration power generation at the second powerhouse will be minimized to reduce fish attraction into this area.

If both auxiliary water systems fail or malfunction close SUE, NDE and NUE and raise SDE weir crest to six feet below tailwater elevation with the floating orifice gates open. Maintain this configuration until the system is repaired. While under this configuration power generation at the second powerhouse will be minimized to reduce fish attraction into this area.

4. Powerhouse and Spillway Adult Fish Collection System

(a) Scheduled Maintenance - (See Appendix A for coordination procedures). Preventive maintenance and repair occurs throughout the year. During the adult fish passage season this maintenance will not involve any operations which will cause failure to comply with the adult fishway criteria except as specially coordinated or as needed for semi-annual maintenance. Because these systems are newly constructed, frequent inspections may be required until observed problems occur less often. Inspection of those parts of the adult collection channel systems which require dewatering, such as diffusion gratings, picketed leads and entrance gates, will be scheduled at least once every ten years with at least one underwater inspection in between unless a channel must be dewatered for fishway modifications or to correct observed problems(See Appendix D for dewatering procedures). Inspection by a diver or underwater video system may be used for the underwater inspections. This scheduled inspection and any associated maintenance will occur during the winter maintenance period. Any non-routine maintenance and fishway modificatons will be handled on a case by case basis. Corps biologists will be on hand during all dewatering activities as well as during inspection operations to provide fishery input (See Appendix D). However, if a biologist cannot be contacted in an emergency, the project will proceed, using all due care to ensure that fish are not stranded or injured. The project will continue to attempt to contact the biologists.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures) - The Bonneville Project contains several types of fishway entrances. There is little potential for failure in some of the entrance types while other types do have histories of occasional failure. In most cases when a failure occurs the entrance can and will be operated manually by project personnel until repairs are made. When this operation becomes necessary project personnel will increase the surveillance of the adult system to insure that criteria are being met. In those cases in which the failure will not allow the entrance to be operated manually the gate will be maintained, to the extent possible, in an operational position. If this is not possible the entrance will be repaired expediently (receive high priority) and the entrance will be brought back into manual or automatic control at the earliest possible date.

6. Adult Fish Ladders and Counting Stations

(a) Scheduled Maintenance (See Appendix A for coordination procedures). - The adult fish ladders are usually dewatered (See Appendix D for dewatering procedures) once each year during the winter maintenance period. During this time the ladders are inspected for blocked orifices, projections into the fishway that may injure fish, stability of the weirs, damaged picketed leads, exit gate problems, loose diffusion gratings, unreadable or damaged staff gauges, defective diffusion valves and malfunctioning operating equipment at the counting stations. Problems identified throughout the passage year that do not affect the ladder operation, as well as those identified during the dewatered period are then repaired.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures). - The Bonneville First Powerhouse ladder was completed in 1937 and the Bonneville Second Powerhouse ladder in 1981. Modification of the first powerhouse ladder was completed during the winter of 1981-82. The structures of the ladders include picketed leads, counting stations, fishway exits and overflow weirs with orifices. Picketed leads can cause problems. Pickets with excessive spacing (greater than 1"), erosion of concrete around the picketed leads or missing pickets can allow fish into areas where escape is not possible. In some instances of picketed lead failure spare picketed leads and spare installation slots are available. In these cases the spare leads are installed and the damaged leads are removed and repaired. In the remaining instances of picketed lead failure or concrete erosion, the timing and method of repair will depend upon the severity of the problem. The decision of whether or not to dewater the fishway and repair any problem will be made in consultation with the fishery agencies and Indian tribes.

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
'POP-P-NR-FFU	Operation of Overflow Weir Entrances at the Bonneville Dam Second Powerhouse.

TO: Chief, Operations-Bon
Thru
Project Manager-Bon

FROM: James R. Kuskie, Jr.

DATE: 7 May 1986
Peters/jlj/236

CMT 1

In normal operation the four second powerhouse overflow fishway entrance gates automatically move to maintain approximately 13.2 feet ± ½ foot below tailwater. These entrances have not functioned properly at certain tailwater elevations since being put into operation. At the present approximate tailwater elevation range (19-24 feet), the south upstream entrance (SUE), south downstream entrance (SDE), and north downstream entrance (NDE) will not lower with a 1.7 foot collection channel to tailwater differential. The north upstream entrance (NUE) is the only entrance gate operational under automatic control at this time.

When conditions occur such that the entrance gates will not lower, it is possible to maintain the fishway closer to standard criteria by operating the gates that will not lower, manually. Under this condition, entrance gates SDE, SUE, NUE, and NDE should be maintained between 11.7 feet and 14.7 feet with an average depth of 13.2 feet. (NUE should remain in automatic control). The 13.2 foot average entrance depth should be calculated based on projected tailwater for the day. This system will require keeping up on tailwater fluctuations and changing the entrance gates in advance of those fluctuations. If it is determined that tailwater will change beyond the above mentioned criteria limits of the entrance gates, then it may be necessary to drop load on the fish units briefly to lower the entrance gates.

It should be noted that fisheries would prefer to operate the entrance gates by automatic control when possible. However, until modifications can be made to accomplish reliable automatic control, the other method described above is recommended.

Gary A. Johnson for
James R. Kuskie, Jr.
Fisheries Biologist

B. Juvenile Fish Passage System

1. Fish Passage Season - March 15 through September each year operate the juvenile bypass systems according to the criteria in Appendix C.

2. Winter Maintenance Period - October 1 through March 14 operate according to the criteria in Appendix C.

3. Submersible Traveling Screens (STS)

(1) Scheduled Maintenance (See Appendix A for coordination procedures) - The STS system will receive preventive maintenance or repair at all times of the year including the winter maintenance period when all STS may be removed from the intakes. Whenever a generator malfunctions or is scheduled for maintenance, the three STS' in that turbine may be maintained, repaired or exchanged for other STS' needing maintenance or repair. One third of the STS' at Bonneville are scheduled for complete overhaul each year resulting in a three-year maintenance cycle unless future developments indicate that longer life expectancy is possible.

(2) Unscheduled Maintenance (See Appendix A for coordination procedures) - If an STS is found to be damaged or inoperative in an operating unit refer to Figure 1. During the peak juvenile passage periods (April 15 to September 15), the day of and four days following a juvenile fish release in the Bonneville pool or when the 24 hour juvenile Salmonid passage by Bonneville exceeds 20,000, a crane crew will be taken off lower priority work or will work overtime to remove and replace (if spare available) a damaged or malfunctioning STS or VBS from any unit needed or likely to be needed for firm energy within the next 48 hours. Crews will work overtime or as call-outs on weekends as required.

4. Juvenile Bypass Systems.

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - The Bonneville juvenile bypass facilities will receive preventive maintenance at all times of the year. During the juvenile fish passage season this will normally be above water work such as maintenance of automatic systems, air lines, electrical systems and monitoring equipment. During the winter maintenance period the systems are dewatered downstream of the gatewell orifices. The systems are then visually inspected in all accessible areas for damaged equipment and areas that may cause problems to the juvenile fish. Any problem areas identified are repaired if the project is able. In extreme cases the work will be contracted as soon as possible or repaired during the next winter maintenance period. Modifications and general maintenance to the channels are also to be completed at this time. The trash racks are to be raked just prior to the juvenile fish passage season and whenever trash accumulations are suspected because of increased head differential across the trash racks or increased juvenile fish descaling is noted at Bonneville. Additional raking of trash racks may be necessary when a storm brings large

quantities of debris down river to the project. Gatewell orifices of the unit being rake must be closed during the procedure (applies only to the first powerhouse).

(b) Unscheduled Maintenance (See Appendix A for coordination procedures)

(1) General Statement - The Bonneville projects' juvenile bypass systems are controlled by automatic systems. When an automatic system fails it usually can be operated manually. This allows either facility to operate according to criteria while repair of the automatic system is completed. Orifices allow fish out of the gatewells into a bypass channel. When the orifices become plugged with debris they are either mechanically (Second Powerhouse) or pneumatically (First Powerhouse) cleaned out.

Figure 1. Operating and Maintenance Instructions in the Event of STS or VBS Failure at Bonneville Dam:

1. If the project is operating with all available units to meet firm energy demands during low debris conditions continue operating until step 3 can be accomplished, otherwise proceed immediately to step 2.

2. Units 10, 9, 18, and 17 will have high priority and will continue in operation under any load conditions (except during high debris period) with failed STS or VBS until step 3 can be accomplished. Under high debris conditions any unit with a failed or malfunctioning STS will be shut down. If either unit 1 or 2 is out of service and the other of these two units has a malfunctioning screen, that unit must stay in operation until station service is available elsewhere. If it is a priority unit the failed STS or VBS will be repaired or replaced within 24 hours. Turbine units 1 and 2 will replace turbine units 9 and 10 in the above priority when the First Powerhouse bypass channel flow is to the south. Any other unit with failed STS or VBS will be shut down until step 3 can be accomplished or that unit is required to meet firm energy demands, in which case the unit will be the last to be brought on line and the first off line.

3. During working hours, assuming the BPA dispatcher will unload Bonneville on request, the unit will be taken out of service and the failed STS or VBS examined. If the required repairs can be accomplished that day, they will be done and the unit may then be returned to service. During the peak juvenile passage period (April 15 - September 15), the day of and four days following a juvenile fish release in the Bonneville pool, or when the 24 hour juvenile salmonid passage by Bonneville exceeds 20,000, an STS fails on a unit required for generation, then a crane crew will be taken off all but higher priority work or will work overtime or weekends to remove and replace (if spare available) the damaged or malfunctioning STS or VBS.

4. If repairs require longer than the rest of the day, the STS or VBS will be replaced with a spare or one from a long term out of service unit. If all available turbines are required to meet firm energy demands, unscreened turbines will be operated. The STS or VBS will be replaced with one from Unit 8 then 7 (PH-1) or Unit 15-13 (PH-2), and the unit will be returned to service. If the unscreened unit must be operated for longer than one week then remove the damaged STS or VBS according to table 1. STS or VBS should be removed from the A-slot first, B-slot second, C-slot third except at unit 7 where the STS or VBS should be removed from the B-slot first, C-slot second and A-slot third. If the failed STS or VBS is in units 7 or 8 the failed STS or VBS will be removed and repaired.

5. All partially screened or unscreened units will be operated according to Appendix C, Bonneville standards 15 through 18 until a spare or repaired STS or VBS is available for installation.

Table 1

Submersible Traveling Screen Removal Order When It Becomes Necessary to Remove a Malfunctioning Submersible Traveling Screen and Operate the Unscreened Unit at Bonneville

	1st Powerhouse Turbine Units		2nd Powerhouse Turbine Units	
Order to Pull 1/	Mar 15 - Jul 5	Jul 6 - Sep 30	Mar 15 - Jul 5	Jul 6 - Sep 30
1	8	8	15	15
2	2	7 1/	14	14
3	1	9	13	13
4	9	10	12	12
5	7 1/	6	16	16
6	10	2	11	11
7	3	5	17	17
8	4	1	18	18
9	6	3	N/A	N/A
10	5	4	N/A	N/A

1/ STS should be removed from the A-slot first, B-slot second, C-slot third except at unit 7 where the STS should be removed from the B-slot first, C-slot second and A-slot third.

The gatewells will be inspected daily and debris removed (debarked) when the gatewell water surface is covered with debris to maintain clean orifices and minimize fish injury. The first powerhouse gatewell orifices must be closed during the debarking process.

(2) Bonneville First Powerhouse - If any part of the dewatering screen, downwell or juvenile release pipe fails, making this portion of the system unsafe for juvenile fish, the juveniles will be diverted to the ice and trash sluiceway. This operating mode will require the gate at the south end of the downstream migrant (DSM) channel to be removed and a stoplog at the north end to be installed so migrants will flow down into the ice and trash sluiceway channel. Sluiceway gate 7A will be opened to a depth of 3.5 feet below the minimum expected forebay to provide safe transportation flows for juveniles. Forebay will be maintained above 74.0 m.s.l. to the extent practicable. The bypass will then continue to function while repairs are completed. In either operating mode the orifices will be cleaned with the air pressure system at least once per day, when plugged orifices are indicated, after trash rack raking and gatewell debarking.

(3) Bonneville Second Powerhouse - If the bypass system fails in the dewatering section, downwell or release pipe, fish may be released through the emergency relief conduit. This operation will continue until repairs are accomplished or until the end of the fish passage season. Any decision on whether or not to shut this system down for dewatering and repairs will be made in consultation with the fisheries agencies and Indian tribes. During this emergency operating mode, power generation will be minimized at the second powerhouse to the extent possible. Repairs will receive high priority.

During fishway inspection activities the VBS may be found to be plugged or damaged. In these cases refer to Figure 1.

C. Turbines and Spillways

1. Scheduled Maintenance (See Appendix A for coordination procedures) - The maintenance and routine repair of project turbines and spillways is a regular and reoccurring process which requires that units be shut down for up to two months (see Appendix D for dewatering procedures). The schedule for this maintenance will be reviewed by NPPOP-P-NR biologists and coordinated within NPP, NPD and BPA. Certain turbine and spillway discharges at the projects are secondarily used to attract adult fish to the area of fishway entrances, to keep predator fish from accumulating in the area of juvenile release sites and to move juveniles downstream away from the project. The maintenance schedules for these turbines (Appendix E) and spillways will reflect equal weighting given to fish, power and water management and will be coordinated with the appropriate resource agencies. No other fish related restrictions regarding maintenance will be placed on any units at these projects, except to coordinate research activities.

...gency + tribal Comments, February 25, 1986 letter, pages 10 + 11.

2. We still believe that partially or fully unscreened units can be operated with little overall impact on total survival at a project. Such an operation will only occur at the lowest passage units and then for only as long as it takes to repair the screens necessary to get the unit fully screened. This repair will receive a high priority. Also, as mentioned, such units will be the last on line and the first off line.

As was clear in our 13 January 1986 letter, we fully intend to consult and coordinate with the agencies and tribes regarding the reduction of the juvenile fish passage seasons. A letter has been prepared and sent to them outlining our intent. ~~We will continue to work with~~

3. The plan does call for the orifices in the first powerhouse to be closed during the raking operation. It is described in the maintenance section but not in the operating criteria. This will be remedied in the next draft.

4 d 5. More frequent inspections of STS + VBS have been requested by the agencies and tribes at Bonneville for quite some time. The problem with implementing has been the labor intensive effort needed to

accomplish more frequent inspections. The project has needed to keep the deck slabs over the gate slots to provide an adequate working area on the first and second powerhouse intake decks. The deck slabs have to be removed to accomplish a video inspection as well as to debark the gateslots. This year the project is going to try leaving the gate slots open through the fish passage season. This should facilitate more frequent inspections and debarking activities. We do not intend to change the criteria this year but should our experience this year indicate more frequent inspections and debarking activities are possible we will consider changing them next year.

6. We intend to evaluate the [redacted] DNFS airlift information for 1985 and [redacted] modify the 20,000 fish trigger to an [redacted] airlift index number. [redacted]

Doug Arndt

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
975 S.E. Sandy Boulevard, Suite 202, Portland, Oregon 97214 Telephone (503) 238-0667

February 25, 1986

Colonel James R. Fry
Deputy Division Engineer
North Pacific Division
Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2870

Dear Colonel Fry:

This letter provides the joint comments of the fishery agencies and tribes on your Draft 1986 Juvenile Fish Passage Plan and Appendices.

These comments take into account the decision of the Northwest Power Planning Council (Council) at their February 13, 1986 meeting regarding the interim juvenile fish survival objective in the Fish and Wildlife Program (Program). We are not entirely satisfied with that decision and have submitted an amendment application to increase the level of interim protection provided for juvenile salmon and steelhead migrants for years subsequent to the 1986 outmigration. We recognize that (within the limits of the FISHPASS model and its inherent assumptions) the levels of spill proposed in your draft plan would meet or exceed the survival objective specified by the Council for 1986 if you removed the condition that limits spill to periods when Federal non-firm energy exists.

In light of the above, the comments that follow concentrate on areas of the draft plan that we believe could be improved within the limitations of the Council's decision. Specifically, we address proposed fish transportation operations, expression of spill amounts as a percentage of daily average discharge, monitoring efforts and the use of monitoring data for in-season management decisions, and the operation and maintenance plans for the Portland and Walla Walla districts. These comments do not address spill amounts at individual projects.

For the record, we incorporate by reference our previously expressed concerns about modeling in general and in particular about the results of the FISHPASS model that are summarized in the plan and used as the primary justification for your recommended alternative.

Among the amendments adopted by the Council is a requirement that the fishery agencies and tribes identify "spill criteria" for

incorporation into your juvenile fish passage plan. The criteria are to include (1) the spring and summer periods that include 80 percent of the typical spring and summer migrations, (2) the daily hours of spill, and (3) the numbers of fish that will trigger spill operations. These are specifications that we would prefer to make in-season based on monitoring data since the first is highly variable between seasons and the second two require information that is largely lacking at the projects in question. We have tried to address this in part in our comments on monitoring and how monitoring data should be used for in-season decision-making. However, we are also reviewing available data and as agreed to at our February 20, 1986 meeting, will provide you with specific "spill criteria" by March 12, 1986.

General Comments

Fish Transportation Operations

We strongly disagree with your proposal to include full transport of all species of juvenile fish under all flow conditions at Lower Granite, Little Goose and McNary Dams. As you know, we have recently reviewed our transportation policies and have agreed to revise our criteria for the transport of spring chinook by increasing the flow trigger (below which we would transport all species) at Lower Granite Dam. Our amended policies would result in more fish being transported, especially spring chinook. However, given the remaining uncertainties about the benefits of transporting spring chinook under good in-river conditions we do not believe transport maximization can be justified under all flow conditions. We urge the Corps to accept and implement this liberalization of our jointly agreed-upon transport guidelines.

At the February 19, 1986 meeting of the Fish Passage Development and Evaluation Program Technical Coordinating Committee, we were informed that reconsideration of the full transport recommendation by the Corps' technical staff would require direction from the policy level within the Corps. It was also suggested that the Corps staff would like to see some resolution of the issue through a meeting of yourself and policy level representatives of the fishery agencies and tribes. We recognize that this is an area where technical experts disagree but we believe the revised guidelines that the fishery agencies and tribes have already jointly recommended provide the most effective use of juvenile fish transportation; and we urge you to join with us in providing this policy guidance. However, if you decide that you cannot agree with these guidelines then we urge you to notify us immediately so that we may explore together the alternatives to the cooperative management that we have been able to maintain in past years.

Spill Expressed as a Percent of Daily Average Flow

The Corps has maintained that spill will be provided when fish are present. The tribes and agencies have repeatedly responded that fish protection is a matter of both when and how much to spill. Since it is assumed that fish passage through spill increases in direct proportion to spill, the quantity to spill is just as important as the duration of spill. For example, the instantaneous spill rate of 20 percent at The Dalles is based on a 12-hour period. Thus, 90 percent survival is achieved by spilling 10 percent of the daily average flow. If on-site monitoring indicates that most of the fish pass in an 8-hour period, then the Corps would spill the same 20 percent instantaneous rate for 8 hours. Total daily average spill, however, would be reduced from 10 percent to 6.7 percent, which in turn would alter the equation from which the 90 percent survival rate was calculated. While it is reasonable to vary spill hours based on monitoring, the instantaneous spill rate should be increased if the total hours of spill are reduced. At the very least, the volume of spill should be a quantity equivalent to the daily average spills derived from the FISHPASS model.

Monitoring and Use of Monitoring Data

We are pleased to see the greatly expanded scope of the monitoring efforts planned for 1986. This will provide valuable information not only for spill management but for evaluation of spill effectiveness as well.

We are also pleased with the explicit provisions included in the monitoring plan for making in-season data available on a daily basis. This will be a substantial improvement over last year when data from The Dalles and Lower Monumental dams were not provided in a timely manner.

Notwithstanding the above improvements, we are concerned that the approach and the proposed coordination provide inadequate opportunity for consultation with the fishery agencies and tribes. Specifically, daily decisions on whether, when, and how long to spill are assigned to the on-site Corps biologist based on pre-determined criteria. This is inconsistent with the Program requirement that the Corps make "in-season spill decisions or adjustments in consultation with the Water Budget Managers."

Responsibility for development of those criteria is not addressed at The Dalles Dam but is explicitly assigned to the Corps at Ice Harbor and Lower Monumental dams. This is inconsistent with the Program requirements that the fishery agencies and tribes specify "the spring and summer periods that include 80 percent of the typical spring and summer migrations, the daily hours of spill, and the numbers of fish that will trigger spill operations."

We are also concerned with the proposed use of hydroacoustic data to make absolute population estimates on an hourly basis, and to use those hourly estimates for managing spill. Based on experience with hydroacoustic monitoring at John Day Dam and at the Mid-Columbia PUD projects, we believe that these data are more appropriately used for determining proportions than absolute numbers, and even then should be considered more in the nature of research results than management data.

We have just received the report from the 1985 monitoring at Lower Monumental Dam and we understand that a copy of the report from The Dalles Dam is in the mail. We object to the fact that these reports were not provided to us in draft for comment. In the future, we request that all such annual reports, including those described in the 1986 monitoring plan, be provided to us in draft, and that our comments on the draft be included in the final report.

Notwithstanding the above, we will review the 1985 reports in detail and, on the basis of that review and the information you have provided on the Corps' plans for hydroacoustic monitoring in 1986, will determine how these hydroacoustic data can best be used to complement the data from our smolt monitoring activities.

As we indicated at our February 20, 1986 meeting, we are also trying to set up a meeting between individuals involved in the Smolt Monitoring Program under section 304(d) and those who will be involved in the Corps' smolt monitoring efforts. It is our hope that these programs can be fully coordinated so that all decisions regarding implementation of juvenile fish passage measures are based on the best available information.

We will address the use of these data in greater detail in our "spill criteria."

Comparison of Alternative Spill Plans

In justification of its spill plan, the Corps draws heavily from FISHPASS model output. Tables 5 - 11 are misleading attempts to summarize the FISHPASS output and, as a result, severely misrepresent the alternative spill plans. We believe that the model results should be presented in terms of percent dam survival for the following reasons:

1. The model output expresses dam and system survival in terms of both percent and number of total fish that survive. Because the Council has chosen to use percent dam survival as a measure of fish protection, the Corps' comparison of alternative plans should be presented in a manner that parallels the Council's guidelines.

2. The Corps' use of an aggregated system mortality has been opposed by nearly all members of the Mainstem Passage Advisory Committee (MPAC). This aggregated mortality is based on the sum of all fish surviving transport and river passage to below Bonneville Dam, regardless of the fact that 25 percent of these fish enter the system just above Bonneville. With such a large proportion of total fish passing only a single dam, the aggregated system mortality is lower than for a stock that must pass all eight dams. The Corps has informally stated that this method is legitimate because it is the Corps' responsibility to protect the largest number of fish regardless of origin. Hence, the Corps should receive just as much credit for a fish entering at Bonneville pool as for one surviving eight dams. Taken to its extreme this reasoning would justify unacceptable management alternatives such as locating all hatcheries below Bonneville Dam. The fact remains that, for political and biological reasons, all fish are not valued equally.

3. The Corps' aggregated system mortality is further flawed because of its treatment of transported fish. Equal credit is given to transported and in-river fish, despite our repeated comments in the MPAC and before the Council that a post-transport survival factor should be applied to transported fish to reflect an apparent differential in the ocean survival of transported and non-transported fish. Our October 2, 1985 memorandum to the MPAC and our January 24, 1986 comments to Chairman Saxvik describe two approaches to determining an appropriate adjustment factor based on limited available data. In the latter we also presented an analyses of the sensitivity of any system survival calculations to the value selected for the post-transport survival factor.

In conclusion, we cannot support the Corps' method of comparing alternative spill plans because it aggregates all stocks of fish, credits transported and in-river migrants equally, and as presented, cannot be easily compared to the Council's percent dam survival standard.

Use of Computer Model to Drive Spill Planning

The Corps attempted to model all relevant factors affecting passage survival. Coefficients were debated and agreed upon in the MPAC for reservoir and turbine mortality, as well as other causes of mortality, in order to partition the various components of mortality. On numerous occasions the agencies and tribes raised concerns about the limitations of the model and the uncertainty of the data inputs. We now find that the results of the modeling are the primary basis supporting the Corps' spill plan.

The model simplifies a very complex system by partitioning mortality into artificial compartments. This simplification has influenced how some people visualize the relationship, or lack of relationship, between reservoir mortality and project mortality and the relative effect that the two have on fish survival. The false assumption that the two are independent has caused attention to be diverted away from the dams where we believe that substantial improvements in passage survival can be made.

Specific Comments

Section 2:

1. The O&M plans were coordinated with us in advance and we appreciate the effort on your part to accomplish as much as possible of this coordination prior to the release of this document. However, this section incorrectly implies that we are in agreement with all of the criteria (Refer to our comments on the O&M plans below).

Section 5:

1. As indicated in our general comments, we disagree with the full transport of all species under all flow conditions at Lower Granite, Little Goose and McNary dams.

2. Bonneville Dam

   We disagree with the proposed limitation on juvenile fish protection to periods when the units are not needed to produce FELCC. The Program says that the juvenile fish protection should be provided unless the units are needed to "meet firm power demands which cannot be met elsewhere in the regional power system." The availability of substantial surplus firm power should provide you with the flexibility to operate below FELCC if necessary to meet fishery objectives in the remainder of the 1985/86 operating year. We recommend that this and all operating constraints necessary to meet the interim juvenile fish protection objectives of the Program be incorporated into system planning beginning with the 1986/87 operating year.

3. The Dalles Dam

   We question the proposed decrease in spill protection in 1986 to 20 percent (instantaneous) from the 24 percent provided in 1985.

The provision that limits spill to periods when Federal non-firm energy exists is inconsistent with the Program and should be deleted. Additionally, since 10 percent of daily average flow in May was set aside at The Dalles Dam in the 1985/86 operating plan, this amount could be spilled even when no Federal non-firm energy exists without impacting firm load or firm capability.

We have not yet received the 1985 hydroacoustic monitoring report for The Dalles Dam but based on experience at other projects we question the ability to estimate hourly passage numbers with sufficient accuracy for use with pre-determined trigger numbers (see our general comments).

4. John Day Dam

The fishery agencies and tribes do not support the operation of unscreened units at John Day Dam.

We believe that the reference to monitoring at John Day Dam, to determine when 30,000 fish per day are present is in error. We understand that there are no plans for hydroacoustic monitoring, and due to the installation of STS's there is insufficient data on the efficiency of the airlift sampling system to expand those collection numbers to a population estimate.

5. Ice Harbor and Lower Monumental Dams

The provision that limits spill to periods when Federal non-firm energy exists is inconsistent with the Program and should be deleted. Additionally, since 25 percent of daily average flow in the last half of April and the month of May was set aside at Lower Monumental Dam in the 1985/86 operating year, this amount could be spilled even when no Federal non-firm energy exists without impacting firm load or firm capability.

We question the ability to estimate hourly passage numbers with sufficient accuracy for use with pre-determined trigger numbers (see our general comments).

6. McNary, Little Goose and Lower Granite Dams

We object to full transport of all species under all conditions. (see our general comments).

Section 6:

The limitations of the FISHPASS model are inadequately described and as a result, the outputs are misused. We object to the current use of this model to drive spill planning (See our general comments).

Section 7:

The spill criteria proposed by the fishery agencies and tribes are not contained in Appendix 1, Enclosure 1 as indicated. As agreed at our February 20, 1986 meeting, we will provide these spill criteria to you by March 12, 1986.

Your statements about treatment of survival at collector projects "to allow existing transportation policies and decision-making to continue," is inconsistent with your proposed maximization of transportation.

Sections 8, 9, 10, 11 and 12

As written, these sections do not support your conclusions. The information presented is poorly explained, confusing, undocumented and generally misleading. We recommend that these sections be rewritten to clearly describe the assumptions inherent in the values presented and how they were derived. (Refer also to our general comments).

Section 14:

The responsibilities of the fishery agencies and tribes should be revised to include the specification of "spill criteria" in accordance with the amended Program.

The responsibilities of the Corps should be revised to include incorporation of the agencies' and tribes' spill criteria into the juvenile fish passage plan and consultation with the Water Budget Managers in making in-season spill decisions.

The responsibilities of both the Corps and the BPA should be revised to include the provision of all smolt monitoring data to the Fish Passage Center on a daily basis during the fish migration season, and the provision of all smolt monitoring reports to the fishery agencies and tribes in draft with opportunity to comment and to have comments incorporated or appended to the final reports.

Appendix 3, Walla Walla District O&M Plan

The fishery agencies and tribes provided comments on drafts of the Corps' proposed operating standards for fish passage facilities at Portland and Walla Walla District projects last December. Most of those comments related to specific areas where proposed fish facility operating standards differed from those in the fish and wildlife agencies' and tribes' 1985 Detailed Fishery Operating Plan (DFOP). We are pleased that a number of changes that were recommended in our comments have been incorporated into the Corps' 1986 Fish Passage Plan. However, some recommendations, especially those related to juvenile passage operating standards, have been largely ignored. Our specific recommendations are reiterated below.

Juvenile Passage Facilities

1. The ending dates for operation of juvenile bypasses should be specified for each project. We propose the lower Snake River project juvenile bypasses be operated through August 31 and the McNary Dam bypass through October 31. The fishery agencies' and tribes' DFOP has been revised to reflect these dates.

2. Inspection of vertical barrier screens (VBS) should be implemented at McNary, Lower Monumental and Lower Granite dams. Prior to April 1 each year, the VBS in each slot at collector dams should be inspected for holes, protrusions and debris buildup by video camera. The inspection should be repeated at McNary Dam for one VBS in a high priority collection unit about July 15. If debris accumulation or damage is noted, other VBS should be inspected, cleaned, and/or repaired as necessary.

3. Operation of the gate slot orifices at Lower Monumental Dam should be alternated such that all 18 orifices are not being operated simultaneously. Since the main bypass pipe has limited capacity, each orifice is not as effective in passing fish with the reduced flow which occurs when all orifices are open. We propose the following operations: operate orifices in Units 3 and 4 continuously, operate orifices in Units 1 and 2 open two days then closed one day, operate orifices in Units 5 and 6 open one day then closed two days, alternate operation of orifices in Units 1 and 2 with orifices in Units 5 and 6. If some orifices are shut down for research or smolt monitoring, the need to cycle the remaining orifices will be reduced correspondingly. Cycling should occur so that not more than 12 orifices are operating at any one time.

4. The Corps should incorporate control measures to reduce predation by birds below dams and bypass outfalls. The Portland District has already initiated some remedial actions, such as stringing monofilament barriers adjacent to outfalls at Bonneville and The Dalles dams.

Adult Passage Facilities

1. A minimum of 8-foot main entrance weir submergence should be maintained. This is especially applicable to the lower Snake River projects. Where 8-foot entrance weir depths cannot be maintained due to sill elevations, head should be greater than 1.0 foot so that entrance flows are nearly the same.

   We believe the inability to maintain the recommended eight foot minimum weir submergence at some of the lower Snake River projects occurs because existing auxiliary attraction flow levels are too low. This is apparently due to inadequate auxiliary attraction flow pump capacities or restrictive constraints on pump operations. If pump capacities or restrictive operational constraints are the reason why the minimum weir submergence criterion can not be met, the Corps should either revise existing operations or provide additional pump capacity.

2. Current spill criteria included in the DFOP were developed from prototype studies of project spill operations before powerhouses were expanded and fliplips were installed. The effects of powerhouse expansion and the installation of fliplips on adult passage are unknown, therefore, verification of spill schedules should be completed. This is especially pertinent to the Snake River projects.

3. The operation of 12 floating orifices is proposed at McNary Dam. It is believed that closing orifices will likely decrease numbers of fish exiting the transportation channel. However, the agencies and tribes believe that all 30 orifices should be operated until 1985 research results are finalized, and formal CBFWC and tribal endorsement of reduced orifice operation is provided.

Appendix 3, Portland District O&M Plan

1. In a letter of 13 January, 1986 from A. J. Heineman, it is stated that operation of partially or fully unscreened turbine units can be done with "little or no impact" to juvenile salmonid survival. Evidence from turbine mortality studies has always shown mortality to occur when juvenile fish pass through hydroelectric turbines; unscreened turbines cannot be operated without significant mortality when migrating juvenile fish are present. Therefore, we strongly reiterate our position that fully or partially unscreened turbines should not be operated at any time.

   Additionally, we object to your statement that this type of operation is consistent with the intent of the Power Act of 1980. Even a broad interpretation of the Act would not allow for operation of hydroelectric turbines in a manner that

would cause continued significant mortality to juvenile migrating salmonids.

2. We strongly object to the Corps' unilateral decision to reduce the juvenile fish protection period by one and a half and two months at John Day and Bonneville dams, respectively. Prior data has indicated the need for fish protection until late November at these projects. Since no recent data has been presented for fishery agency and tribal reconsideration of juvenile fish protection periods, we believe juvenile fish protection should continue through November 30 at Bonneville Dam and November 15 at John Day Dam.

3. Gatewell orifices should be closed at Bonneville Powerhouse I when trash racks are being raked. Orifices can be easily closed, reducing the occurrence of orifice blockage and the risk of damage to the inclined screen.

4. STS and VBS inspections should be more frequent at Bonneville Dam than the 3 month interval specified. A three month inspection interval means a torn/damaged screen could be in service for up to three months, an unacceptable length of time. One month inspection intervals would reduce the potential for substantial fish injury and would agree with criteria established by the fishery agencies and tribes in the DFOP.

5. Gatewells at Bonneville Dam should be cleaned when half-covered with debris. Fully-covered gatewells can have debris to an unknown depth, causing orifice blockage and fish injury/mortality. Also, when debris is removed from fully-covered gatewells, more fish are injured/killed than when partially-covered gatewells are cleaned.

6. Operating standards provide for no operation of unscreened units at John Day during certain time periods, based on a 20,000 fish trigger. With no monitoring to determine total fish numbers at John Day in 1986, this trigger number cannot be determined. We recommend that fully or partially unscreened turbines not be operated at any time at John Day Dam.

Rolland A. Schmitten, Chairman
Columbia Basin Fish and
Wildlife Council

S. Timothy Wapato, Execu. Dir.
Columbia River Inter-Tribal
Fish Commission

cc: CBFWC - Martinson (for distribution)
NPPC - Saxvik & Carpenter
COE - Flightner
BPA - Smith
PNUCC - Wright
FPC - DeHart and Karr
NMFS - Ebel

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
847 NE 19th AVENUE, SUITE 350
PORTLAND, OREGON 97232-2279
(503) 230-5400

February 26, 1986 F/NWR5

Mr. Gary Flightner
Chief, Power Section
North Pacific Division
Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2870

Dear Mr. Flightner:

At the Corps of Engineers Juvenile Fish Passage Plan meeting on February 20, 1986 a request was made by the National Marine Fisheries Service for the Corps draft hydroacoustic reports concerning work conducted at John Day Dam in 1983 and 1984. These reports are needed to assist in development of fish "trigger" numbers for initiation of spill in the Lower Columbia River, information that the fishery agencies and tribes have agreed to provide to the Corps by March 12, 1986.

During the past year, this information was requested informally from the Bonneville Dam fisheries office. Also, on February 21, and again on February 24, formal requests were made by phone to the fisheries office. To date we have not received the requested information.

We wish to provide the most accurate information possible, based on all presently available data. Any needless delay in delivery of these reports could result in delayed delivery of "trigger" numbers and a concurrent delay in development of the Corps Juvenile Fish Passage Plan, scheduled for completion and implementation by April 1, 1986. Therefore, we would greatly appreciate an expedited delivery of these reports.

Thank you for your assistance.

Sincerely,

for

Dale R. Evans
Division Cheif

cc: A. Heineman - District Corps
G. Johnson - District Corps
J. Kuskie - District Corps
S. Burchfield - CRITFC
FPC

Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

FEB 24 1986

In reply refer to: PJ

Mr. Gary Flightner, Chief
Power Section, Water Management Branch
North Pacific Division
Corps of Engineers
PO Box 2870
Portland, OR 97208-2870

Dear Mr. Flightner:

Per your request of January 31, 1986, we have reviewed the Draft Juvenile Fish Passage Plan for Corps of Engineers Projects and have the following comments.

Page 4, 1st Sentence

It is not clear how research activities will dictate the operation of the Bonneville second powerhouse. For example, you should state who will settle conflicts between research operations and fish passage operations. We also suggest you add wording to the effect that agency and Tribal approved research will take precedence over in-season fish passage operations requested by the Fish Passage Center. Significant deviations should be coordinated through Reservoir Control Center.

Page 6, Second Bullet Statement

We suggest that you do not spill 50 percent of the flow exceeding the capacity of unscreened units at John Day Dam as this may tend to attract more fish away from the screened units. Every effort should be made to not operate unscreened units.

Page 10, Last Bullet Statement

We are in full concurrance with your statement that all juvenile fish collected will be transported within system capabilities. We assume this means that all fish will be transported, regardless of flow levels.

Page 29, Item a (1)

We suggest that you specifically state that the agencies and tribes provide spill priority lists, when requested, for distribution of spill over and above the levels specified for LMN, IHR, and TDA for periods when such unanticipated spill may exist. Requests for spill beyond that specified in this Plan for fish protection should be made at least three (3) days in advance of anticipated delivery with supporting data. These requests should be made following the daily briefings, in person by the Water Budget managers. This forum will give others, such as Bonneville Power Administration, a chance to interact in the decision-making process with the Water Budget managers.

Thank you for the opportunity to comment. We anticipate being very involved with this and future year's operations concerning Water Budget and spill.

Sincerely,

John R. Palensky, Director
Division of Fish and Wildlife

NPPOP-P-NR

Bonneville First Powerhouse S.T.S. Removal

PE, Bonn

Ch, Operations Div.

28 October 1986
Johnson/6073/bk

1. Reference recent communications between Bonneville Project personnel and Cary Johnson of my staff plus Mr. Johnson and the Fish Passage Center, submerged traveling screens may be removed from three turbines (Units 8,7,and 6) at Powerhouse 1. It is requested that you sequentially remove S.T.S. from these units in the above order, as needed to acheive your maintenance requirement, this may result in partially screened units at Powerhouse 1. During this activity, screened units at both powerhouses should operate before unscreened units at either powerhouse. However, partially screened units at Powerhouse 1 should operate before any units at Powerhouse 2. Unscreened units at either powerhouse may be operated to meet energy demands but should be last on line and first off line as energy demands fluctuate. Once a unit at either powerhouse is unscreened there is no requirement to rescreen unless the numbers of juvenile salmonids passing the project significantly increases.

2. The above will be in effect until 15 November when a reduced operation of Powerhouse 1 has been requested by Atkinson Co. for the new navigation lock construction activities. After this date, S.T.S. may be removed from Units 3,4,5 and 9 with units 1,2 and 10 emaining screened until December 1 when all S.T.S. may be removed from the units at both powerhouses. During the period from 15 November through 30 November, Powerhouse 1 should be operated as required in the above mentioned contract and Powerhouse 2, including unscreened units, may be operated as needed to meet energy demands and to avoid spill. Again, unscreened units should be last on and first off as energy demands and flows fluctuate.

3. Questions regarding the above should be directed to Cary Johnson (x6073) or Jim Ruskie (x236) of my staff.

A. J. HEINEMAN
Chief, Operations Division

CF: NPPOP-P-NR (FTU)
NPPPL-PW
NPPCO-S-P (McKillie)
NPPEN-PE-CR
NPEEN-WE (Cayanus)
NPDPL-LR

HEINEMAN
NPPOP

GARDNER
NPPOP-P

STEGMEIER
NPPOP-P-NR

JOHNSON
NPPOP-P-NR
6073/bk
28OCT86
wp

NPPOP-P-NR

Bonneville and John Day Dams Juvenile Bypass Systems Operating Season

PM, BON
PM, TDJD

Chief, Operations Division

30 September 1986
Johnson/6073/1e

1. In a 26 August 1986 DF to you reference the above subject, clarification was not provided regarding operation of partially or fully unscreened units at either project nor operation of the Bonneville Second Powerhouse beyond 30 September. The following guidelines are provided for your implementation:

Bonneville First Powerhouse

1. During the period 1 October through 15 October operate the same as the 15 March through 15 April period (#16) in the 1986 Operating Standards for the Bonneville Project.

2. During the period 16 October through 30 November follow criteria #19 in the 1985 Operating Standards for the Bonneville Project.

Bonneville Second Powerhouse

During the period 1 October through 30 November follow criteria #23 in the 1986 Operating Standards for the Bonneville Project.

John Day Dam

During the period 1 October through 15 November follow criteria #18 in the 1985 Operating Standards for the John Day Project.

2. The 1985 Operating Standards were attached to the above mentioned DF and the 1986 Operating Standards are in Appendix 3 of the Juvenile Fish Passage Plan for 1986 for The Corps of Engineers' Projects.

3. Questions regarding the above guidelines should be directed to Gary Johnson (x6073) of my staff.

A. J. HEINEMAN
Chief, Operations Division

SIGN

HEINEMAN
NPPOP

GARDNER
NPPOP-P

STEGMEIER
NPPOP-P-NR

JOHNSON
NPPOP-P-NR
6073/1e
30Sep86
wp

COLUMBIA BASIN FISH & WILDLIFE COUNCIL
700 N.E. MULTNOMAH ST., SUITE 1240
PORTLAND, OREGON 97232

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
975 S.E. SANDY BLVD., SUITE 202
PORTLAND, OREGON 97214

OCT 3 1986

Colonel James R. Fry
Corps of Engineers North Pacific Division
P.O. Box 2870
Portland, OR 97208-2870

Dear Colonel Fry:

We are in receipt of your September 8, 1986 response to the concerns expressed in our July 3, 1986 letter about operation of juvenile passage and monitoring facilities at the Corps' Columbia and Snake river dams. We are pleased that you have instructed your staff in both the Portland and Walla Walla districts to work with our staffs to examine reasonable fish facility operational criteria. We believe that the review of criteria is best accomplished through staff-to-staff interaction on a regular basis, rather than the one-time annual review that the Corps has used in previous years. We also believe that the Corps' recent agreement to hold meetings of the Fish Passage Development and Evaluation Program Technical Coordinating Committee (FPDEP-TCC) on a monthly basis can greatly improve coordination. We are hopeful that this improved coordination will, among other things, result in greater cooperation in the development of mutually satisfactory operating standards.

In the way of clarification, we would also like to draw your attention to our concerns about the start-up dates for juvenile fish facilities. These concerns, which were the main point of our July 3, 1986 letter, stem from our experiences during the past two years. In both years, we were informed by the districts at the start of the fish passage season that the start-up for the juvenile fish facilities could not proceed on the schedule that we felt was necessary due to inadequate manpower or operating funds. This year we were also presented with conflicts due to navigation lock maintenance. (Fortunately, the Corps was able to reschedule the annual lock maintenance in 1986 to accommodate fish screen installation.) Our July 3, 1986 letter provided information on our release schedules and monitoring needs for 1987 and subsequent years, so that these kinds of logistical problems can be resolved with adequate lead time.

A final point concerning your letter deals with your statement that extended operation cannot be justified because of the resulting wear and tear on the submersible traveling screens and the subsequent reduced reliability during periods of peak fish

movement. In our view, it should be the timing of fish passage at a project that drives the scheduling of STS operation. At the same time however, we do recognize that maintaining these screens in good operating condition is a major task and that weather and staffing constraints make it an extremely difficult one, especially in the relatively short winter repair season allowed at the lower river projects. Measures now being implemented at Bonneville Dam, such as the maintenance building under construction, the STS transport system under development, and the increase in the level of support services devoted to keeping the screens functional are all steps in the right direction. In view of the high screen failure rates experienced at Bonneville and McNary Dams this past season, a greater number of spare screens may also be required to improve the current maintenance situation. We encourage you to proceed with these or even more comprehensive approaches to the screen maintenance problems in both districts.

We will continue to work with your staff on project-specific criteria through the FPDEP-TCC and whatever subcommittees or working groups that the Committee deems necessary.

Thank you for your assistance and cooperation in this matter.

Dale A. Reese

FOR Rolland A. Schmitten
Chairman, CBFWC

S. Timothy Wapato

S. Timothy Wapato
Executive Director, CRITFC

cc: NPP
NPW
CBFWC Members
AFPC Members
FPC

DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION, CORPS OF ENGINEERS
P.O. BOX 2870
PORTLAND, OREGON 97208-2870

REPLY TO
ATTENTION OF:

16 JUL 1986

NPDPL-ER

SUBJECT: Operation and Maintenance Schedules for Juvenile Bypass Facilities

Commander, Portland District
Commander, Walla Walla District

1. The Fishery agencies and tribes have sent the enclosed letter in which they make a number of requests pertinent to the startup, maintenance, and operation schedules of fish facilities at our mainstem projects.

2. We would appreciate it if you would examine their specific requests for those projects in your District and let this office (Attn: NPDPL-ER) know of your thoughts by 31 July 1986.

3. If you have any questions, or need to discuss this matter with us, contact Doug Arndt, (X2835).

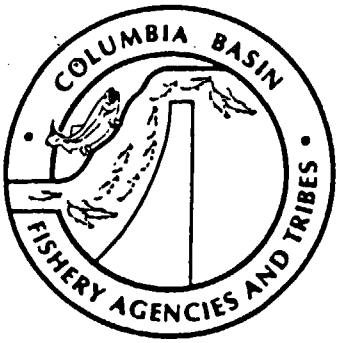
FOR THE COMMANDER:

SIGNED

1 Encl

JAMES R. FRY
Colonel, Corps of Engineers
Deputy Commander

CF:
Gary Johnson, NPPOP-P-NR
Jim Athearn, NPWOP-RM



COLUMBIA BASIN FISH & WILDLIFE COUNCIL
700 N.E. MULTNOMAH ST., SUITE 1240
PORTLAND, OREGON 97232

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
975 S.E. SANDY BLVD., SUITE 202
PORTLAND, OREGON 97214

July 3, 1986

Colonel James R. Fry
Deputy Division Engineer
Corps of Engineers
P.O. Box 2870
Portland, OR 97208

Dear Colonel Fry:

We have become increasingly concerned about problems related to early season operation of juvenile passage and monitoring facilities at mainstem Columbia and lower Snake River dams operated by the Corps of Engineers. There appears to be an increasing trend toward reducing equipment wear, extending maintenance periods, and avoiding operating costs at the expense of both fish passage and scientifically sound juvenile fish monitoring programs. This year we were also presented with conflicts due to navigation lock maintenance impacting installation and water-up of juvenile screening and passage facilities. This compounds the problem that our recommendations for spring start-up of facilities were already not being met.

We have also been frustrated in our attempts to work with Portland and Walla Walla Districts to provide spring start-up of juvenile monitoring activities for Water Budget and spill management called for in the Columbia River Basin Fish and Wildlife Program annual Research and Monitoring Plan. To help avoid conflicts from occurring next year, information on desirable start-up dates is being provided for coordination and planning purposes. Preliminary proposed sampling dates for initiating smolt monitoring activities at mainstem Corps projects during 1987 are: March 15 at Bonneville Dam, March 20 at Lower Granite Dam, March 25 at Little Goose, Lower Monumental, McNary and John Day dams, and March 30 at The Dalles Dam. Juvenile bypass facilities at Lower Granite, Little Goose, McNary and John Day dams should be watered up five days before sampling begins and collection systems should be tested 3-4 days before smolt monitoring begins. These start-up times are important to accurately identify the initial ten percent points used to define the beginning of the intervals for 80% of the spring migration at individual sites used for spill and flow management as well as identifying early migrating stocks. We have discussed this issue and the entire smolt monitoring program with your staff during the summer previous to the sampling season during both of the

last two years and sought their comments. In each case we were later advised by Operations Chiefs in the two Districts in response to our logistics coordination requests that they had inadequate manpower or operating funds in their current budgets to accommodate our requests. We believe it is critical that you now address these issues with adequate lead times so that logistic limitations can be overcome where and if necessary.

This year smolt monitoring activities at the Bonneville First Powerhouse have consisted of consolidating data collection with Corps funded research to evaluate that facility's trap efficiency. That research is expected to continue at least through July. If agreeable to the Corps, following completion of trap efficiency research we intend to field a smolt monitoring crew to continue trap sampling through the month of November. With respect to future operation of the existing trap at the Bonneville First Powerhouse, the unreliable operation of the screen sweep and awkward sampling box require redesign and complete rebuilding by March 1, 1987 so that the facility can be used to monitor the smolt migration in a reliable and consistent manner. To ensure monitoring of the 1986 summer outmigration, the screen sweep needs to be replaced or repaired as soon as possible to facilitate operations for the remainder of the 1986 smolt outmigration.

Our concern about early spring operations is heightened by increases in early spring migrants occurring due to present and anticipated increases in upriver stocks and new hatchery programs involving the early spring release of yearling fall chinook. Early spring hatchery releases (March through the first week of April) include an early March release consisting of three to four million subyearling fall chinook from Spring Creek National Fish Hatchery and about 1.8 million yearling fall chinook from Ringold, Lyons Ferry, and Rocky Reach hatcheries during the first week of April. Those fish released from Spring Creek and Lyons Ferry hatcheries normally begin arriving at Corps projects within a matter of hours. Other early spring releases that normally begin arriving at Corps projects within several days include coho, spring chinook, and fall chinook released from Ringold, Dworshak, Carson, Kooskia, Round Butte, Klickitat and Irrigon hatcheries. We anticipate that similar production releases will occur again next year both at approximately the same time and in numbers equal to or greater than those which occurred this spring.

We ask for your attention regarding the important issue of start-up scheduling of spring operation of juvenile facilities. We also request that the Corps actively consult with us in the

development of facilities operating criteria. These criteria must be responsive to fish needs and consistent with sampling programs of the annual Research and Monitoring Plan prepared by the fishery agencies and tribes. Thank you for your assistance.

Rolland A. Schmitten
Chairman, CBFWC

S. Timothy Wapato
Executive Director, CRITFC

cc: Fishery Agency Directors
Chairman, AFPC
Executive Secretary, CBFWC
NPPC - Carpenter
BPA - Smith
FPC

5-6-86 - The Dalles s/riceweevy 16 h sunrise to sunset

Jim & Rock,
Here's the DF
on operation of
JBS's after 30 Sept.
Gary

READING FILE

NPPOP-P-NR

Bonneville and John Day Dams Juvenile Bypass Systems
Operating Season

PM, BON
PM, TDJD

Chief, Operations
Division

30 September 1986
Johnson/6073/le

1. In a 26 August 1986 DF to you reference the above subject, clarification was not provided regarding operation of partially or fully unscreened units at either project nor operation of the Bonneville Second Powerhouse beyond 30 September. The following guidelines are provided for your implementation:

Bonneville First Powerhouse

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3. Questions regarding the above guidelines should be directed to Gary Johnson (x6073) of my staff.

SIGN

HEINEMAN
NPPOP

A. J. HEINEMAN
Chief, Operations Division

GARDNER
NPPOP-P

STEGMEIER
NPPOP-P-NR

JOHNSON
NPPOP-P-NR
6073/le
30Sep86
wp

OCT - 6

from Quinn O'Brian 5-15-86

FEDERAL COLUMBIA RIVER POWER SYSTEM RESERVOIRS - the Federally-owned projects that generate hydroelectric power include the following existing and planned projects:

Albeni Falls
Anderson Ranch
Big Cliff
Black Canyon
Boise Diversion
Bonneville
Chandler
Chief Joseph
Cougar
Detroit
Dexter
Dworshak
Foster
Grand Coulee, including Pumped Storage and Third Powerplant
Green Peter
Green Springs
Hills Creek
Hungry Horse
Ice Harbor
John Day
Libby
Little Goose
Lookout Point
Lost Creek
Lower Monumental
McNary
Minidoka
Palisades
Roza
Strube (Cougar Reregulator) 1/
Teton 2/
The Dalles

1/ Planned.
2/ Status undetermined.

FIRM ENERGY - electric energy which is intended to have assured availability to the customer to meet all or any agreed upon portion of his load requirements.

FIRM ENERGY LOAD CARRYING CAPABILITY (FELCC) - the firm energy load that a system is able to supply in any period after deducting the required energy reserve and Forced Outage Reserve.

FIRM POWER - power intended to have assured availability to the customer to meet all or any agreed upon portion of his load requirements.

FLOOD CONTROL RULE CURVE - a curve or family of curves of reservoir contents, with respect to time, indicating space required to control flood flow. These curves are determined from analysis of magnitude, duration, and potential damage of flood flows throughout the year or for certain periods during the year.

FORCED OUTAGE - the shutting down of a generating unit, transmission line, or other facility, for emergency reasons.

FUEL REPLACEMENT ENERGY - electric energy generated at a hydroelectric plant as a substitute for energy which would otherwise have been generated by a thermal-electric plant.

GENERATING UNIT - an electric generator together with its prime mover.

GENERATION - act or process of producing electric energy from other forms of energy; also the amount of electric energy so produced.

HISTORICAL STREAMFLOW - is synonymous with observed streamflow.

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

RENCE OR OFFICE SYMBOL	SUBJECT
NPPOP-P-NR	Fish Facilities Maintenance Plan and Operating Standards

TO: SEE DISTRIBUTION

FROM: Chief, Operations Div.

DATE: 27 Jan 86

CMT 1

Johnson/6075/mra

1. The subject document is attached for your review and comment. Suspense date for comments is 20 February 1986.

2. Questions should be directed to Gary Johnson (x6073) of my staff.

Raymond B. Heineman

A. J. HEINEMAN
Chief, Operations Division

DISTRIBUTION:

NPPOP-P
NPPOP-Bonn
NPPOP-TDA
NPPOP-JDA
NPPPL-FW
PEN-C
DPL-ER
NPPOP-P-NR (FFU) ✓
NPPCO
NPDEN-WM

All changes, additions and deletions are highlighted.

NPPOP-P-NR 23 January 1986

SUBJECT: District Operations and Maintenance Criteria for Project Fish Passage Facilities

Deputy Commander, North Pacific Division
ATTN: NPDPL-ER

1. Reference your 14 November 1985, letter requesting an updated Fish Facilities Maintenance Plan and Operating Standards. Please find the requested document attached.

2. Agreement could not be reached with the fishery agencies and Indian tribes on one item contained in the subject document and has not been completed on another item:

a. The operation of partially or fully unscreened turbine units during the fish migration season is not supported by the fishery agencies and Indian tribes. It is our intent to avoid such an operation. However, if such an operation is necessary to meet firm energy demands during the peak of the juvenile run or with any load conditions during the low fish passage periods we feel it can be done with little or no impact to juvenile salmonid survival. In addition, any units so operated will be the last units to be brought on-line and the first off-line. This operation appears to be consistent with the intent of the Pacific Northwest Electric Power Planning and Conservation Act of 1980.

b. Discussion is underway with the fishery agencies and Indian tribes on reducing the length of our juvenile fish passage seasons at Bonneville and John Day dams. Data collected during the previous two years by the National Marine Fisheries Service indicate minimal juvenile fish passage at both projects after September 30 and before March 15 at Bonneville Project. This reduction will significantly reduce the running time on the submerged traveling screens plus provide a longer maintenance period both of which should result in a much improved performance during the peaks of the juvenile outmigration. The attached plan includes this proposed reduction in time. We will finalize this change in future correspondence.

3. We have responded to a letter received from the Columbia Basin Fish and Wildlife Council which results in a new operating standard and an additional area of possible disagreement with the fishery agencies. The letter requests the operation of the ice and trash sluiceway at Bonneville Project's first powerhouse during all flow conditions when "substantial numbers of juvenile steelhead are present." This operation is supposed to provide protection to those fish accumulating on the north side of the powerhouse wingwall. The Council's letter does not include nor does there appear to be conclusive

evidence supporting this operation on a full scale basis with the resulting loss in power revenues. However, we feel the available data and on-site observations support this type of operation when involuntary spill is occurring at the project. We are informing the Columbia Basin Fish and Wildlife Council and Indian tribes of our intent to begin this operation during the 1986 fish passage season but only when involuntary spill is occurring at Bonneville.

4. If you require additional information please contact Gary Johnson, FTS 423-6073.

FOR THE COMMANDER:

A. J. HEINEMAN
Chief, Operations Division

M.F.R:

1. The timing of this response has been coordinated with Mr. Doug Arndt (NPDPL-ER) of the letter's originating office and he concurs with our later delivery. The original letters stated suspense date did not allow time for the necessary coordination with the fishery agencies, Indian tribes, and our affected projects.

2. The Fish Facilities Maintenance Plan and Operating Standards document was prepared as a result of a measure included in the Pacific Northwest Electric Power Planning and Conservation Council's Fish and Wildlife Program. The intent of the document is to formalize our plans to operate and maintain our many fish facilities under normal and emergency situations. Much of the document describes standard operating procedures which have been practiced by our projects for years. Portions involve concepts and practices which are at the leading edge of knowledge regarding fish passage and as such are subject to controversy. The project managers and their respective staffs have been very cooperative throughout the life of this document and have provided numerous constructive comments. Through this cooperation the document has proven to be workable for the projects as well as informative to outside interests.

3. One item in this letter, the reduction in the juvenile fish passage season, has not been finalized at this time. Data supporting this reduction has been received by phone but we are waiting for the report before finalizing this change. This condition has been coordinated with Doug Arndt (NPDPL-ER), and he concurs with including the change in the subject document.

MAR 18 1986

DING FILE

Operations Division (NPPOP-P-NR)

SEE ATTACHED ADDRESSEES

Portland District has been operating submersible traveling screens (STS's) at Bonneville Dam for the past several years and began STS operation at John Day Dam in 1985. Based on our experiance to date, one of our major maintenance concerns is assuring continued operations of the STS system throughout the entire passage season. Operating these two projects under present criteria results in a large number of accumulated hours of STS operation, greatly reducing the effective life of these machines. In addition, the length of the present passage season does not allow sufficient time for maintenance and repairs. More time is needed for this maintenance to assure dependable protection during the periods of high juvenile salmonid passage.

The need to provide protection to the downstream migrating juvenile fish is recognized and strongly supported by the Corps. However, we believe STS operation could be discontinued during periods of minimal juvenile salmonid passage at both Bonneville and John Day Dams without significantly affecting the overall protection presently provided. As suggested by fishery agency representatives at the February 15, 1984 Fish Passage Development and Evaluation Program meeting, a data base on juvenile passage was needed to balance the juvenile fish needs with an effective STS maintenance season. We contracted the National Marine Fisheries Service (NMFS) to provide this data base and they have estimated that during the 1985 juvenile passage season, only 1.7% of the fish passed Bonneville Dam during the October - November time frame and 2.0% of the fish passed John Day Dam during October. Communications with the NMFS monitoring team at John Day Dam revealed that 1980 was the last year when appreciable numbers of juvenile salmonids passed that dam after September.

Based on the low passage numbers after September at both projects, we intend to change the operating standards which define the passage season for these projects and The Dalles Dam. At Bonneville Dam, the juvenile bypass season start-up date will be determined by the release schedule for the Bonneville pool hatcheries, but no earlier than March 1 and no later than

SIGN

LORD
NPPDE

HEINEMAN
NPPOP

DUNCAN
NPPPL-FW

FOUTS
NPPOP-P

STEGMEIER
NPPOP-P-NR
JOHNSON
NPPOP-P-NR
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March 15, while no changes will occur in the start-up dates at The Dalles and John Day Dams. The last day of the juvenile salmonid passage season at all three projects will be September 30 unless monitoring at Bonneville and John Day Dams indicate appreciable numbers of juvenile salmonids are still passing through these projects. In this case the STS operating season would be extended for that year until passage declined at both Bonneville and John Day Dams. The ending date for sluiceway operation at The Dalles Dam will remain at November 15, however, the period from October 1 through November 15 will be designated as sluiceway operation for shad fingerling passage.

Sincerely,

Gary R. Lord
Colonel, Corps of Engineers
District Engineer

CF: NPPOP-BONN
NPPOP-TD/JD
NPPPL-FW
NPDPL-ER
NPDEN-WM

MFR.

This action has been coordinated with NPPPL-FW, NPDPL-ER, NPDEN-WM and the projects with their full support. The agencies and tribes were made aware of this proposal at the February 19 technical meeting of the Fish Passage Development and Evaluation Programs.

[1] Mr. S. Timothy Wapato, Exec. Director
Columbia River Inter-Tribal Fish Commission
2705 E. Burnside, Suite 114
Portland, OR 97214[4]

[1] Mr. William R. Wilkerson, Director
Washington Department of Fisheries
Room 115, General Administration Bldg.
Olympia, WA 98504[4]

[1] Dr. John R. Donaldson, Director
Oregon Department of Fish and Wildlife
P.O. Box 3503
Portland, OR 97208[4]

[1] Mr. Jerry M. Conley, Director
Idaho Fish and Game Department
P.O. Box 25
Boise, ID 83707[4]

[1] Mr. Richard J. Myshak, Regional Director
U.S. Fish and Wildlife Service
Lloyd 500 Bldg., Suite 1692
500 N.E. Multnomah Street
Portland, OR 97232[4]

[1] Mr. Rolland Schmitten, Regional Director
National Marine Fisheries Service
7600 Sand Point Way, NE
BIN C15700
Seattle, WA 98115[4]

[1] Mr. Jack Wayland, Director
Washington Department of Game
600 N. Capitol Way
Olympia, WA 98504[4]

COLUMBIA BASIN FISH AND WILDLIFE COUNCIL
LLOYD BUILDING • SUITE 1240
700 N. E. MULTNOMAH STREET
PORTLAND, OREGON 97232

(503) 231-2241
FTS 429-2241

May 16, 1986

Colonel Gary Lord, District Engineer
Portland District
Corps of Engineers
P.O. Box 2946
Portland, OR 97208

Dear Colonel Lord:

The Portland District of the Corps of Engineers (Corps) has proposed to reduce the period of time the juvenile bypass facilities operate at Portland District Columbia River projects. At present, submerged traveling screen (STS) and bypass operation is required for the entire juvenile fish passage season from March 1 through November 30 at Bonneville, April 1 to November 25 at The Dalles and April 1 through November 15 at John Day dams. We understand that this proposal is based on the Corps' concern for their ability to provide maintenance for continued operation of the STS's throughout the entire juvenile fish passage season.

The Corps' letter of March 18, 1986 emphasizes removal of STS's. However, we note that the 1986 District maintenance plan also provides for dewatering of the bypass facilities. Therefore, the crux of the proposal is the complete removal of juvenile fish protection at Bonneville and John Day dams for 6-8 weeks after September of each year.

We are aware of the large amount of STS maintenance required each year and understand the Corps' concern. However, the Corps has made no mention of the amount of time/wear they estimate will be saved by removal of STS's at the earlier dates. Present criteria allow for cycling of STS's during this period and removal of up to one half of the STS's for maintenance as long as no partially or fully unscreened units are operated. With this flexibility for STS maintenance in the fall, it is unclear why the remainder of the screens must be removed. We would be interested in reviewing and discussing your estimate of the increase in reliability to be gained by removal of all STS's during this period.

In discussion of the fishery impact, the Corps has presented only general percentages of late fall juvenile fish passage from one year of data and referred only to the lack of "appreciable numbers," rather than specific numbers, of fish passing the projects after September. One year of data indicating a small percentage of fish passage during the fall would not lead us to make long-term decisions which would change fish passage criteria presently in effect. As stated in our comments on the Corps' Draft 1986 Juvenile Fish Passage Plan (letter to Col. J. Fry,

February 25, 1986), prior data indicate the need for fish protection until mid-to-late November at these projects. If the Corps believes recent juvenile fish passage data relating to late fall passage in the Lower Columbia River warrant a reevaluation of the juvenile fish protection period, we encourage the Corps to present such data for review. We would be quite willing to consult with the Corps in this matter.

We would like to point out that the present juvenile fish passage protection period at McNary Dam continues until late October each year. It doesn't make sense to operate the juvenile fish passage facilities of an upstream project because fish are present, while not operating such facilities at the lower projects. Based on the fish protection period provided at McNary and allowing for travel time of subyearling fish from McNary to Bonneville, fish protection at Bonneville should be provided until mid-late November.

In conclusion, we object to the Corps' unilateral proposal for a reduced fall protection period for juvenile fish. The purpose of juvenile fish protection facilities is to mitigate for juvenile fish mortalities caused by hydropower generation. A reduction in the juvenile fish protection period constitutes a reduction in mitigation. We also do not believe the authorities of the Corps provide for Corps' determination and implementation of fish passage protection periods without fishery agency/tribal consultation and agreement. In our view, the fishery agencies and tribes are the entities ultimately responsible for the determination of fish protection periods. We look forward to consultation with you on this matter.

Sincerely,

for Rolland A. Schmitten
Chairman

cc: CBFWC - Martinson (for distribution)
FPC
NPPC
CRITFC - Burchfield

ROCK

^^

BON R 102486 0845 BON TDA NPD NPP BPA

ATTN: BONNEVILLE

1. BASED ON CURRENT BIOLOGICAL. POWER AND STREAMFLOW CONDITIONS. THE OPERATION OF SCREENED UNITS IN BONNEVILLE SECOND POWERHOUSE IS AUTHORIZED TO PREVENT SPILL BUT NOT FOR PEAKING. BONNEVILLE SECOND POWERHOUSE UNITS SHOULD BE LAST ON AND FIRST OFF.

2. THIS HAS BEEN COORDINATED WITH GARY JOHNSON (NPP). PHIL JORDAN (BON). JACK LARSEN (BPA) AND COL. FRY (NPD) AND WILL BE IN EFFECT UNTIL FURTHER NOTICE.

JIM CAYANUS
NPD/RCC
GKD

RUN UNIT 18 FIRST, THEN 17, 11, 16 IN THAT ORDER. PLJ

YYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYX

BON R 112186 1450 TDA BPA NPP NPD

ATTN: BONNEVILLE AND BPA

(REF. CONTRACT SECTION 5.3.10 - REGULATION SCHEDULE AND
TTY TIME-DATED 111786-1450)

BONNEVILLE PROJECT DAILY AVERAGE INFLOWS ARE
FORECASTED TO NOT EXCEED 161.000 CFS FOR THE FIVE-DAY
PERIOD BEGINNING 22 NOVEMBER 1986. THEREFORE. IT IS REQUESTED
THAT FIRST POWERHOUSE MAIN UNIT DISCHARGE BE LIMITED TO THE
EQUIVALENT OF 2 GENERATING UNITS. ABOUT 28,000 CFS FROM 0800 HOURS
ON SATURDAY, 22 NOVEMBER THROUGH 2400 HOURS ON WEDNESDAY.
26 NOVEMBER, EXECEPT FOR THE PERIOD FROM 0800 HOURS ON SUNDAY.
23 NOVEMBER THRU 0600 HOURS ON MONDAY, 24 NOVEMBER.

2 A. THEREFORE. DURING TIMES WHEN FLOWS ARE REQUESTED TO BE
SHIFTED. UNITS SHOULD BE RUN ACCORDING THE FOLLOWING PRIORITY
LIST:

1) OPERATE SCREENED UNITS IN FIRST POWERHOUSE (UP TO TOTAL
DISCHARGE OF 28.000 CFS)
2) OPERATE SCREENED UNITS IN SECOND POWERHOUSE
3) OPERATE UNSCREENED UNITS IN SECOND POWERHOUSE.
- LOWER PRIORITY UNITS SHOULD BE LAST ON AND FIRST OFF

B. WHEN FLOWS ARE NOT REQUESTED TO BE SHIFTED (I.E.. ON SUNDAYS)
UNITS SHOULD BE RUN ACCORDING TO THE FOLLOWING PRIORITY LIST:

1) OPERATE COMPLETELY SCREENED UNITS IN FIRST POWERHOUSE
2) OPERATE PARTIALLY SCREENED UNITS IN FIRST POWERHOUSE
3) OPERATE SCREENED UNITS IN SECOND POWERHOUSE
4) OPERATE UNSCREENED UNITS IN FIRST POWERHOUSE
5) OPERATE UNSCREENED UNITS IN SECOND POWERHOUSE.
- LOWER PRIORITY UNITS SHOULD BE LAST ON AND FIRST OFF.

NOTE: THIS PRIORITY LIST WILL BE CHANGED ON DECEMBER 1 WHEN SECOND
POWERHOUSE FISHERY RESTRICTIONS ARE LIFTED.

2. THIS SCHEDULE IS BASED ON THE BEST INFORMATION AVAILABLE AT
THIS TIME OF ISSUE. IT IS SUBJECT TO UNFORESEEN CHANGES IN
WEATHER, POWER SYSTEM CONDITIONS. AND GENERATING UNIT MALFUNCTIONS.
CHANGES TO THE FORECAST WILL BE MADE 24-HOURS IN ADVANCE UNLESS
UNFORESEEN CONDITIONS NECESSITATE SHORTER NOTICE.

3. IT IS REQUESTED THAT BONNEVILLE PROJECT OPERATIONS INFORM THE
BONNEVILLE AREA OFFICE OF THE CONTENT OF THIS MESSAGE AND PROVIDE THEM
A COPY OF THIS TTY ASAP. IT IS ALSO REQUESTED THAT BONNEVILLE
OPERATIONS INFORM RCC IF ANY CHANGES NEED TO BE MADE TO THIS SCHEDULE.

4. UPDATES TO THIS TTY WILL BE MADE ON MONDAYS AND FRIDAYS
NEEDS DICTATE OTHERWISE.

JIM FODREA
NPD/RCC
GKD

****
BON R 120986 1300 TDA BPA NPP NPD

ATTN: BONNEVILLE AND BPA

TUE DEC 09 1986

(REF. CONTRACT SECTION 5.3.10 - REGULATION SCHEDULE AND
TTY TIME-DATED 111786-1450)

1. A CHANGE IN POWER SYSTEM CONDITIONS HAS RESULTED IN AN INCREASE IN ANTICIPATED LOWER COLUMBIA RIVER FLOWS. BONNEVILLE DAILY AVERAGE INFLOWS FOR THE PERIOD 9 DECEMBER THRU 14 DECEMBER ARE NOW EXPECTED TO EXCEED 160,000 CFS THRU FRIDAY, 12 DECEMBER AND BE NEAR 160,000 CFS OVER THE WEEKEND. THEREFORE, IT IS REQUESTED THAT THE TOTAL DISCHARGE THRU UNITS 1 TO 10 BE LIMITED TO 38,000 CFS THRU 2400 HOURS ON FRIDAY, 12 DECEMBER. IF, HOWEVER, WEEKDAY FLOWS ARE LESS THAN FORECASTED, IT IS REQUESTED THAT THE FIRST POWERHOUSE FLOW BE LIMITED TO 28,000 CFS IF POSSIBLE.

2. SINCE WEEKEND FLOWS ARE NOT EXPECTED TO EXCEED 160,000 CFS, IT IS REQUESTED THAT FIRST POWERHOUSE FLOWS BE LIMITED TO 28,000 CFS FROM 0000 HOURS ON SATURDAY, 13 DECEMBER TO 2200 HOURS ON SUNDAY, 14 DECEMBER. THERE WILL BE NO LIMIT TO FIRST POWERHOUSE FLOWS (OTHER THAN THE NORMAL OPERATING LIMITS) FROM 2200 HOURS ON SUNDAY, 14 DECEMBER THRU 0600 HOURS ON MONDAY, DECEMBER. AN UPDATE TO THIS TELECOM WITH REGULATION INSTRUCTIONS FOR THE WEEK OF 15 DECEMBER WILL BE MADE ON FRIDAY, 12 DECEMBER.

3. THIS REQUEST IS BASED UPON THE BEST AVAILABLE INFORMATION AT THE TIME OF ISSUE. IT IS SUBJECT TO UNFORESEEN CHANGES IN WEATHER, POWER SYSTEM CONDITIONS, AND GENERATOR UNIT MALFUNCTIONS. CHANGES TO THE FORECAST AND TO THE REQUESTED TYPE OF OPERATION OF THE FIRST POWERHOUSE WILL BE MADE 24 HOURS IN ADVANCE UNLESS UNFORESEEN CONDITIONS NECESSITATE SHORTER NOTICE.

4. IT IS REQUESTED THAT BONNEVILLE PROJECT OPERATIONS INFORM THE BONNEVILLE AREA OFFICE OF THE CONTENT OF THIS MESSAGE AND PROVIDE THEM A COPY OF THIS TTY ASAP. IT IS ALSO REQUESTED THAT BONNEVILLE OPERATIONS INFORM RCC IF ANY CHANGES NEED TO BE MADE TO THIS SCHEDULE.

JIM FODREA
NPD/RCC
GKD
****

BON R 111986 0850 TDA BPA NPP NPD

ATTN: BONNEVILLE AND BPA

WED NOV 19 1986

(REF. CONTRACT SECTION 5.3.10 - REGULATION SCHEDULE AND
TTY TIME-DATED 111786-1450)

1. STARTING TIME OF REGULATION TO DIVERT FLOWS TO SECOND POWERHOUSE HAS BEEN POSTPONED ONE DAY AND WILL NOW BEGIN ON THURSDAY. 20 NOVEMBER AT 0800 HOURS. BONNEVILLE PROJECT DAILY AVERAGE INFLOWS ARE FORECASTED TO NOT EXCEED 161.000 CFS FOR THE SEVEN-DAY PERIOD BEGINNING 20 NOVEMBER 1986. THEREFORE. IT IS REQUESTED THAT FIRST POWERHOUSE DISCHARGES BE LIMITED TO THE EQUIVALENT OF 2 GENERATING UNITS. ABOUT 28.000 CFS FROM 0800 HOURS ON THURSDAY. 20 NOVEMBER THROUGH 2400 HOURS ON WEDNESDAY. 26 NOVEMBER. EXECEPT FOR THE PERIOD FROM 0800 HOURS ON SUNDAY. 23 NOVEMBER THRU 0800 HOURS ON MONDAY. 24 NOVEMBER.

2. THIS SCHEDULE IS BASED ON THE BEST INFORMATION AVAILABLE AT THIS TIME OF ISSUE. IT IS SUBJECT TO UNFORESEEN CHANGES IN WEATHER. POWER SYSTEM CONDITIONS. AND GENERATING UNIT MALFUNCTIONS. CHANGES TO THE FORECAST WILL BE MADE 24-HOURS IN ADVANCE UNLESS UNFORESEEN CONDITIONS NECESSITATE SHORTER NOTICE.

3. IT IS REQUESTED THAT BONNEVILLE PROJECT OPERATIONS INFORM THE BONNEVILLE AREA OFFICE OF THE CONTENT OF THIS MESSAGE AND PROVIDE THEM A COPY OF THIS TTY ASAP. IT IS ALSO REQUESTED THAT BONNEVILLE OPERATIONS INFORM RCC IF ANY CHANGES NEED TO BE MADE TO THIS SCHEDULE.

4. UPDATES TO THIS TTY WILL BE MADE ON MONDAYS AND FRIDAYS NEEDS DICTATE OTHERWISE.

JIM FODREA
NPD/RCC
GKD
****

NPP PROJECTS

FISH FACILITIES MAINTENANCE PLAN AND OPERATING STANDARDS

BONNEVILLE, THE DALLES, JOHN DAY, FOSTER AND GREEN PETER DAMS

JANUARY 1986

U.S. Army Corps of Engineers, Portland District
ATTN: NPPOP-P-NR
P.O. Box 2946
Portland, Oregon 97204
(503) 221-6073

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
'POP-P-NR-FFU	Operation of Overflow Weir Entrances at the Bonneville Dam Second Powerhouse.

TO: Chief, Operations-Bon
Thru
Project Manager-Bon

FROM: James R. Kuskie, Jr.

DATE: 7 May 1986
Peters/jlj/236

CMT 1

In normal operation the four second powerhouse overflow fishway entrance gates automatically move to maintain approximately 13.2 feet ± ½ foot below tailwater. These entrances have not functioned properly at certain tailwater elevations since being put into operation. At the present approximate tailwater elevation range (19-24 feet), the south upstream entrance (SUE), south downstream entrance (SDE), and north downstream entrance (NDE) will not lower with a 1.7 foot collection channel to tailwater differential. The north upstream entrance (NUE) is the only entrance gate operational under automatic control at this time.

When conditions occur such that the entrance gates will not lower, it is possible to maintain the fishway closer to standard criteria by operating the gates that will not lower, manually. Under this condition, entrance gates SDE, SUE, NUE, and NDE should be maintained between 11.7 feet and 14.7 feet with an average depth of 13.2 feet. (NUE should remain in automatic control). The 13.2 foot average entrance depth should be calculated based on projected tailwater for the day. This system will require keeping up on tailwater fluctuations and changing the entrance gates in advance of those fluctuations. If it is determined that tailwater will change beyond the above mentioned criteria limits of the entrance gates, then it may be necessary to drop load on the fish units briefly to lower the entrance gates.

It should be noted that fisheries would prefer to operate the entrance gates by automatic control when possible. However, until modifications can be made to accomplish reliable automatic control, the other method described above is recommended.

Gary A. Johnson for
James R. Kuskie, Jr.
Fisheries Biologist

I. Bonneville Dam

A. Adult Fish Passage System

1. Fish Passage Season - March 1 through November each year operate according to criteria in Appendix B.

2. Winter Maintenance Season - December 1 through February each year operate according to criteria in Appendix B.

3. Fishway Auxiliary Water Systems

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - Bonneville Project auxiliary water systems consist of gravity flow and generating systems. Preventive maintenance and normal repair are carried out throughout the year.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures) - Most fishway auxiliary water systems are operated automatically. If the automatic system fails the system can usually be operated manually by project personnel. This will allow the fish facility to operate according to criteria while repair of the automatic system is carried out. When this operation becomes necessary project personnel will increase the surveillance of the adult system to ensure that criteria are being met.

Bonneville First Powerhouse - If any of the valves or any other part of the system fails, the project is to attempt to maintain criteria by adjusting those valves which continue to function. Conduit pressures must be monitored and not allowed to exceed the established limits. If this maneuver fails to keep the facility operating according to the adult fishway criteria and repairs cannot be made within 24 hours then close powerhouse entrances (9, 21, 34, 58 and 62) one at a time starting with gate 9 and proceed north.

If closing the orifice gates fails to achieve a minimum fishway head of 1.2 feet when tailwater is greater than 17 feet then raise gate 65 weir in one-foot increments up to 6 feet of depth below the tailwater surface. If this fails to achieve the proper fishway head criteria, then raise gate 1 weir in one-foot increments to 6 feet of depth below the tailwater surface.

When tailwater elevation is less than 17 feet and the gate 65 weir crest is at least 6 feet below tailwater, close gate 64 in one-foot increments until the proper head is achieved or the gate is fully closed, then raise gate 65 in one-foot increments up to 6 feet below tailwater. If the gate 65 weir crest is less than 6 feet below tailwater, fully open gate 64 and close gate 65. If this fails to achieve the proper fishway head and the gate 1 weir crest is at

least 6 feet below tailwater, close gate 2 in one-foot increments until fully closed, then raise gate 1 in one-foot increments up to 6 feet below tailwater. If the gate 1 weir crest is less than 6 feet below tailwater, fully open gate 2 and close gate 1. At this point maintain the gates position regardless of whether criteria are met or not, until the auxiliary water system is repaired.

Bonneville Spillway - Two separate fishway auxiliary water valves add water to each spillway ladder (Cascades Island and B-Branch ladders). If one of these valves or any other part of the system malfunctions, the functioning parts of the system are to be adjusted to compensate. If repairs cannot be made in 24 hours, close the sluicegate entrance, if open. This will divert the reduced available water to the entrance slots. If a head of 1.0 foot is still not achieved, stoplogs are to be added to the entrance slots until the desired head or a weir depth of not less than 6 feet below the tailwater surface is reached. At this point maintain the gate positions until the auxiliary water system is repaired.

Bonneville Second Powerhouse - If either of the fishway auxiliary water turbines are unable to provide water sufficient to meet full criteria, raise the North Upstream Entrance (NUE) in one-foot increments until the weir crest is 6 feet below the tailwater or a fishway head of at least 1.2 feet is achieved. If this fails to achieve the above criteria then apply the same procedure, until the criteria is achieved, using in addition the North Downstream Entrance (NDE) then, the South Upstream Entrance (SUE), and finally the South Downstream Entrance (SDE). The weir crests for these three entrances should not be raised above 8 feet below tailwater. If the correct fishway head criteria is still not achieved after this procedure, then fully close NUE and operate in this configuration until repairs can be made to the system.

If both of the fishway auxiliary water turbines fail, the backup fishway auxiliary water system, using gravity flow through the ice and trash sluiceway, will be started up. The adult facility will be operated as follows: (1) Close NDE, SUE and NUE; (2) Operate the SDE weir crest at eight feet below tailwater; (3) Operate the floating orifice gates. However, if the backup fishway auxiliary water system must be used for a period exceeding 30 days, then block off as many of the center floating orifice gates as possible and open NDE with a weir depth of eight feet below the tailwater water surface. While under this configuration power generation at the second powerhouse will be minimized to reduce fish attraction into this area.

If both auxiliary water systems fail or malfunction close SUE, NDE and NUE and raise SDE weir crest to six feet below tailwater elevation with the floating orifice gates open. Maintain this configuration until the system is repaired. While under this configuration power generation at the second powerhouse will be minimized to reduce fish attraction into this area.

4. Powerhouse and Spillway Adult Fish Collection System

(a) Scheduled Maintenance - (See Appendix A for coordination procedures). Preventive maintenance and repair occurs throughout the year. During the adult fish passage season this maintenance will not involve any operations which will cause failure to comply with the adult fishway criteria except as specially coordinated or as needed for semi-annual maintenance. Because these systems are newly constructed, frequent inspections may be required until observed problems occur less often. Inspection of those parts of the adult collection channel systems which require dewatering, such as diffusion gratings, picketed leads and entrance gates, will be scheduled at least once every ten years with at least one underwater inspection in between unless a channel must be dewatered for fishway modifications or to correct observed problems(See Appendix D for dewatering procedures). Inspection by a diver or underwater video system may be used for the underwater inspections. This scheduled inspection and any associated maintenance will occur during the winter maintenance period. Any non-routine maintenance and fishway modificatons will be handled on a case by case basis. Corps biologists will be on hand during all dewatering activities as well as during inspection operations to provide fishery input (See Appendix D). However, if a biologist cannot be contacted in an emergency, the project will proceed, using all due care to ensure that fish are not stranded or injured. The project will continue to attempt to contact the biologists.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures) - The Bonneville Project contains several types of fishway entrances. There is little potential for failure in some of the entrance types while other types do have histories of occasional failure. In most cases when a failure occurs the entrance can and will be operated manually by project personnel until repairs are made. When this operation becomes necessary project personnel will increase the surveillance of the adult system to insure that criteria are being met. In those cases in which the failure will not allow the entrance to be operated manually the gate will be maintained, to the extent possible, in an operational position. If this is not possible the entrance will be repaired expediently (receive high priority) and the entrance will be brought back into manual or automatic control at the earliest possible date.

6. Adult Fish Ladders and Counting Stations

(a) Scheduled Maintenance (See Appendix A for coordination procedures). - The adult fish ladders are usually dewatered (See Appendix D for dewatering procedures) once each year during the winter maintenance period. During this time the ladders are inspected for blocked orifices, projections into the fishway that may injure fish, stability of the weirs, damaged picketed leads, exit gate problems, loose diffusion gratings, unreadable or damaged staff gauges, defective diffusion valves and malfunctioning operating equipment at the counting stations. Problems identified throughout the passage year that do not affect the ladder operation, as well as those identified during the dewatered period are then repaired.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures). - The Bonneville First Powerhouse ladder was completed in 1937 and the Bonneville Second Powerhouse ladder in 1981. Modification of the first powerhouse ladder was completed during the winter of 1981-82. The structures of the ladders include picketed leads, counting stations, fishway exits and overflow weirs with orifices. Picketed leads can cause problems. Pickets with excessive spacing (greater than 1"), erosion of concrete around the picketed leads or missing pickets can allow fish into areas where escape is not possible. In some instances of picketed lead failure spare picketed leads and spare installation slots are available. In these cases the spare leads are installed and the damaged leads are removed and repaired. In the remaining instances of picketed lead failure or concrete erosion, the timing and method of repair will depend upon the severity of the problem. The decision of whether or not to dewater the fishway and repair any problem will be made in consultation with the fishery agencies and Indian tribes.

B. Juvenile Fish Passage System

1. Fish Passage Season - March 15 through September each year operate the juvenile bypass systems according to the criteria in Appendix C.

2. Winter Maintenance Period - October 1 through March 14 operate according to the criteria in Appendix C.

3. Submersible Traveling Screens (STS)

(1) Scheduled Maintenance (See Appendix A for coordination procedures) - The STS system will receive preventive maintenance or repair at all times of the year including the winter maintenance period when all STS may be removed from the intakes. Whenever a generator malfunctions or is scheduled for maintenance, the three STS' in that turbine may be maintained, repaired or exchanged for other STS' needing maintenance or repair. One third of the STS' at Bonneville are scheduled for complete overhaul each year resulting in a three-year maintenance cycle unless future developments indicate that longer life expectancy is possible.

(2) Unscheduled Maintenance (See Appendix A for coordination procedures) - If an STS is found to be damaged or inoperative in an operating unit refer to Figure 1. During the peak juvenile passage periods (April 15 to September 15), the day of and four days following a juvenile fish release in the Bonneville pool or when the 24 hour juvenile Salmonid passage by Bonneville exceeds 20,000, a crane crew will be taken off lower priority work or will work overtime to remove and replace (if spare available) a damaged or malfunctioning STS or VBS from any unit needed or likely to be needed for firm energy within the next 48 hours. Crews will work overtime or as call-outs on weekends as required.

4. Juvenile Bypass Systems.

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - The Bonneville juvenile bypass facilities will receive preventive maintenance at all times of the year. During the juvenile fish passage season this will normally be above water work such as maintenance of automatic systems, air lines, electrical systems and monitoring equipment. During the winter maintenance period the systems are dewatered downstream of the gatewell orifices. The systems are then visually inspected in all accessible areas for damaged equipment and areas that may cause problems to the juvenile fish. Any problem areas identified are repaired if the project is able. In extreme cases the work will be contracted as soon as possible or repaired during the next winter maintenance period. Modifications and general maintenance to the channels are also to be completed at this time. The trash racks are to be raked just prior to the juvenile fish passage season and whenever trash accumulations are suspected because of increased head differential across the trash racks or increased juvenile fish descaling is noted at Bonneville. Additional raking of trash racks may be necessary when a storm brings large

quantities of debris down river to the project. Gatewell orifices of the unit being rake must be closed during the procedure (applies only to the first powerhouse).

(b) Unscheduled Maintenance (See Appendix A for coordination procedures)

(1) General Statement - The Bonneville projects' juvenile bypass systems are controlled by automatic systems. When an automatic system fails it usually can be operated manually. This allows either facility to operate according to criteria while repair of the automatic system is completed. Orifices allow fish out of the gatewells into a bypass channel. When the orifices become plugged with debris they are either mechanically (Second Powerhouse) or pneumatically (First Powerhouse) cleaned out.

Figure 1. Operating and Maintenance Instructions in the Event of STS or VBS Failure at Bonneville Dam:

1. If the project is operating with all available units to meet firm energy demands during low debris conditions continue operating until step 3 can be accomplished, otherwise proceed immediately to step 2.

2. Units 10, 9, 18, and 17 will have high priority and will continue in operation under any load conditions (except during high debris period) with failed STS or VBS until step 3 can be accomplished. Under high debris conditions any unit with a failed or malfunctioning STS will be shut down. If either unit 1 or 2 is out of service and the other of these two units has a malfunctioning screen, that unit must stay in operation until station service is available elsewhere. If it is a priority unit the failed STS or VBS will be repaired or replaced within 24 hours. Turbine units 1 and 2 will replace turbine units 9 and 10 in the above priority when the First Powerhouse bypass channel flow is to the south. Any other unit with failed STS or VBS will be shut down until step 3 can be accomplished or that unit is required to meet firm energy demands, in which case the unit will be the last to be brought on line and the first off line.

3. During working hours, assuming the BPA dispatcher will unload Bonneville on request, the unit will be taken out of service and the failed STS or VBS examined. If the required repairs can be accomplished that day, they will be done and the unit may then be returned to service. During the peak juvenile passage period (April 15 - September 15), the day of and four days following a juvenile fish release in the Bonneville pool, or when the 24 hour juvenile salmonid passage by Bonneville exceeds 20,000, an STS fails on a unit required for generation, then a crane crew will be taken off all but higher priority work or will work overtime or weekends to remove and replace (if spare available) the damaged or malfunctioning STS or VBS.

4. If repairs require longer than the rest of the day, the STS or VBS will be replaced with a spare or one from a long term out of service unit. If all available turbines are required to meet firm energy demands, unscreened turbines will be operated. The STS or VBS will be replaced with one from Unit 8 then 7 (PH-1) or Unit 15-13 (PH-2), and the unit will be returned to service. If the unscreened unit must be operated for longer than one week then remove the damaged STS or VBS according to table 1. STS or VBS should be removed from the A-slot first, B-slot second, C-slot third except at unit 7 where the STS or VBS should be removed from the B-slot first, C-slot second and A-slot third. If the failed STS or VBS is in units 7 or 8 the failed STS or VBS will be removed and repaired.

5. All partially screened or unscreened units will be operated according to Appendix C, Bonneville standards 15 through 18 until a spare or repaired STS or VBS is available for installation.

Table 1

Submersible Traveling Screen Removal Order When It Becomes Necessary to Remove a Malfunctioning Submersible Traveling Screen and Operate the Unscreened Unit at Bonneville

	1st Powerhouse Turbine Units		2nd Powerhouse Turbine Units	
Order to Pull 1/	Mar 15 - Jul 5	Jul 6 - Sep 30	Mar 15 - Jul 5	Jul 6 - Sep 30
1	8	8	15	15
2	2	7 1/	14	14
3	1	9	13	13
4	9	10	12	12
5	7 1/	6	16	16
6	10	2	11	11
7	3	5	17	17
8	4	1	18	18
9	6	3	N/A	N/A
10	5	4	N/A	N/A

1/ STS should be removed from the A-slot first, B-slot second, C-slot third except at unit 7 where the STS should be removed from the B-slot first, C-slot second and A-slot third.

The gatewells will be inspected daily and debris removed (debarked) when the gatewell water surface is covered with debris to maintain clean orifices and minimize fish injury. The first powerhouse gatewell orifices must be closed during the debarking process.

(2) Bonneville First Powerhouse - If any part of the dewatering screen, downwell or juvenile release pipe fails, making this portion of the system unsafe for juvenile fish, the juveniles will be diverted to the ice and trash sluiceway. This operating mode will require the gate at the south end of the downstream migrant (DSM) channel to be removed and a stoplog at the north end to be installed so migrants will flow down into the ice and trash sluiceway channel. Sluiceway gate 7A will be opened to a depth of 3.5 feet below the minimum expected forebay to provide safe transportation flows for juveniles. Forebay will be maintained above 74.0 m.s.l. to the extent practicable. The bypass will then continue to function while repairs are completed. In either operating mode the orifices will be cleaned with the air pressure system at least once per day, when plugged orifices are indicated, after trash rack raking and gatewell debarking.

(3) Bonneville Second Powerhouse - If the bypass system fails in the dewatering section, downwell or release pipe, fish may be released through the emergency relief conduit. This operation will continue until repairs are accomplished or until the end of the fish passage season. Any decision on whether or not to shut this system down for dewatering and repairs will be made in consultation with the fisheries agencies and Indian tribes. During this emergency operating mode, power generation will be minimized at the second powerhouse to the extent possible. Repairs will receive high priority.

During fishway inspection activities the VBS may be found to be plugged or damaged. In these cases refer to Figure 1.

C. Turbines and Spillways

1. Scheduled Maintenance (See Appendix A for coordination procedures) - The maintenance and routine repair of project turbines and spillways is a regular and reoccurring process which requires that units be shut down for up to two months (see Appendix D for dewatering procedures). The schedule for this maintenance will be reviewed by NPPOP-P-NR biologists and coordinated within NPP, NPD and BPA. Certain turbine and spillway discharges at the projects are secondarily used to attract adult fish to the area of fishway entrances, to keep predator fish from accumulating in the area of juvenile release sites and to move juveniles downstream away from the project. The maintenance schedules for these turbines (Appendix E) and spillways will reflect equal weighting given to fish, power and water management and will be coordinated with the appropriate resource agencies. No other fish related restrictions regarding maintenance will be placed on any units at these projects, except to coordinate research activities.

THE DALLES ADULTS

II. The Dalles Dam.

A. Adult Fish Passage System.

(1) Fish Passage Season - March 1 through November according to criteria in Appendix B.

(2) Winter Maintenance Season - December 1 through February each year operates according to criteria in Appendix B.

(3) Fishway Auxiliary Water Systems.

(a) Scheduled Maintenance (see Appendix A for coordination procedures) - The Dalles Project auxiliary water systems consist of gravity flow and generating systems. Preventive maintenance and normal repair are carried out during the winter maintenance season.

(b) Unscheduled Maintenance (see Appendix A for coordination procedures) - Most fishway auxiliary systems are operated automatically. If the automatic system fails, the system can usually be operated manually by project personnel. This will allow the fish facility to operate according to criteria while the repair of the automatic system is carried out. When this operation becomes necessary project personnel will increase the surveillance of the adult system to ensure that criteria are being met.

The Dalles Powerhouse - If one of the two fishway auxiliary water turbines fails or malfunctions during the spring or summer (April 1 - July 31) adult migration seasons use the following procedure until a fishway head of 1.2 feet is achieved: (1) Raise the open West Powerhouse Entrance (W1, W2 and/or W3) weirs in one foot increments until proper head is achieved or until the weir reaches 6 feet of depth below the tailwater surface. (2) Raise the East Entrance weirs (E1, E2, E3) in one foot increments to 6 feet of depth below the tailwater surface. (3) If more than one West Entrance weir is operating close all but one entrance. (4) Close one east entrance (E1). (5) Raise the South spillway entrance weirs (S1, S2) in one foot increments to 6 feet of depth below the tailwater surface. (6) Close alternating floating orifice starting from the west end of the powerhouse. (7) Close one South spillway entrance (S2). (8) If a fishway head of 1.2 feet is still not achieved leave in this configuration until more auxiliary water becomes available. Then reverse the above procedure.

If one of the fishway auxiliary water turbines fails or malfunctions during the fall (August - November) adult migration season use the following procedure until a fishway head of 1.2 feet is achieved: (1) Raise the open West Powerhouse Entrance weir(s) in one-foot increments to 6 feet of depth below the tailwater surface. (2) Raise the South spillway entrance weirs in one foot increments to 6 feet of depth below the tailwater surface. (3) If more than one West Entrance weir is operating close all but one (W1). (4) Close one South Spillway entrance (S2). (5) Raise the East Entrance weirs in one foot increments to 6 feet of depth below the tailwater surface. (6) Close every other floating orifice starting from the west end of the powerhouse.

(7) Close one East Entrance weir (E1). (8) If a fishway head of 1.2 feet is still not achieved leave in this configuration until more auxiliary water becomes available. Then reverse the above procedure.

If both of the fishway auxiliary water turbines fail or malfunction, regardless of fish passage season, the adult fish passage facility will be operated as follows: (1) S1 open with the weir crest 6 feet below the tailwater surface, S2 closed; (2) The junction pool weir supplying the powerhouse collection system and west powerhouse entrances will be closed; (3) E3 will be open with the weir crest 6 feet below the tailwater surface and E1 and E2 will be closed.

The Dalles North Ladder - If the gravity flow fishway auxiliary water system fails, N1 will remain open with a weir depth of 6 feet below the tailwater surface and N2 will be closed.

(4) Powerhouse and Spillway Adult Fish Collection System

(a) Scheduled Maintenance - (see Appendix A for coordination procedures) - Preventative maintenance and repair occurs throughout the year. During the adult fish passage season the maintenance will not involve any operations which will cause a failure to comply with the fishway criteria. Inspection of those parts of the adult collection channel systems, such as diffusion gratings, picketed leads and entrance gates, will be scheduled at least once every five years unless a channel must be dewatered for fishway modifications or to correct observed problems. Inspection by a diver or underwater video system may be used for the underwater inspections. This scheduled inspection and any associated maintenance will occur during the winter maintenance period. Any non-routine maintenance and fishway modification will be handled on a case by case basis. Corps biologists will be on hand during the dewatering activities as well as during inspection operations to provide fishery input (See Appendix D). However, if a biologist cannot be contacted in an emergency, the project will proceed using all due care to ensure that fish are not stranded or injured. The project will continue to attempt to contact the biologists.

(b) Unscheduled Maintenance (see Appendix A for coordination procedures) - The Dalles Project contains several types of fishway entrances. There is little potential for failure in some of the entrance types while other types do have histories of occasional failure. In most cases when failures occur the entrance can and will be operated manually by project personnel until repairs are made. When this operation becomes necessary project personnel will increase the surveillance of the adult system to ensure that criteria are being met. In those cases in which the failure will not allow the entrance to be operated manually the gate will be maintained, to the extent possible, in an operational position. If this is not possible the entrance will be repaired in an expedient manner (high priority) and the entrance will return to manual or automatic control at the earliest possible date.

4. Adult Fish Ladders and Counting Stations

(a) Scheduled Maintenance (See Appendix A for coordination procedures). - The adult fish ladders are usually dewatered (See Appendix D for dewatering procedures) once each year during the winter maintenance period. During this time the ladders are inspected for blocked orifices, projections into the fishway that may damage fish, stability of the weirs, damaged picketed leads, exit gate problems, loose diffusion gratings, unreadable or damaged staff gauges, defective diffusion valves, and malfunctioning operating equipment at the counting stations. The wooden weir caps are inspected and replaced if necessary. Problems identified throughout the passage year that do not affect the ladder operation, as well as those identified during the dewatered period are then repaired.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures). - The structures of the ladders include picketed leads, counting stations, fishway exits and overflow weirs with orifices. The Dalles Dam has experienced a problem with the East fish ladder in which a weir tipped over. This created a large head across the next upstream orifice which completely stopped shad passage but did not appear to impede salmonid passage. In this case, after consulting with the fishery agencies, the ladder was dewatered, the weir was tipped upright and bolted into place. The remaining weirs were inspected and the ladder was then watered back up. The following winter all weirs in the east fish ladder were bolted into place.

Picketed leads can cause problems. Pickets with excessive spacing (greater than 1"), erosion of concrete around the picketed leads or missing pickets can allow fish into areas where escape is not possible. In some instances of picketed lead failure there are spare picketed leads and spare installation slots. In these cases the spare leads are installed and the damaged leads are removed and repaired. In the remaining instances of picketed lead failure or concrete erosion, the timing and method of repair will depend upon the severity of the problem. The decision of whether or not to dewater the fishway and repair any problem will be made in consultation with the fishery agencies and Indian tribes.

B. Juvenile Fish Passage System

(1) Fish Passage Season. April 1 through November 15 each year operate according to the criteria in Appendix C.

(2) Winter Maintenance Period. November 16 through March each year operate according to the criteria in Appendix C.

3. Juvenile Collection and Transportation Systems.

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - The Dalles ice and trash sluiceway will receive preventive maintenance at all times of the year. During the juvenile fish passage season this will normally be above water work such as maintenance of automatic systems, air lines, electrical systems and monitoring equipment. During the winter maintenance period the systems are dewatered downstream of the gatewell orifices. The system is then visually inspected in all accessible areas for damaged equipment and areas that may cause problems to the juvenile fish. Any problem areas identified are repaired and modifications to the channel and general maintenance are completed. The trash racks are raked just prior to the juvenile fish passage season (April 1), whenever trash accumulations are suspected because of increased head differential across the trash racks or increased descaling of juvenile fish is noted at The Dalles or Bonneville dams and that Bonnevilles's trash racks are clean.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures)

(1) The ice-trash sluiceway is now being used as a juvenile bypass system. Historically there have been few problems associated with this system. The chain gates on The Dalles' juvenile bypass system are fully opened during normal operation. When a chain gate fails, an adjacent gate can be operated until repairs can be made. Orifices allow fish out of the gatewells into the sluiceway. When the orifices become plugged with debris they are manually cleaned. The gatewells will be inspected daily and debris removed (debarked) when floating debris covers more than one-half the water surface. Gate hoists have been added to the system to simplify the adjustment of the gates used to attract fish into the sluiceway. If one of the hoists fail, repair promptly. If this cannot be done, the gate can be adjusted with the intake deck gantry crane or an adjacent gate may be operated with the intake deck gantry crane until repairs are completed on the hoist. The gate will be removed when there are problems with the seal and the difficulty cannot be repaired promptly. If the epoxy lined section of the sluiceway is found to be damaged, it will be repaired.

C. Turbines and Spillways

1. Scheduled Maintenance (See Appendix A for coordination procedures) - The maintenance and routine repair of project turbines and spillways is a regular and reoccurring process which requires that units be shut down for up to two months (see Appendix D for dewatering procedures). The schedule for this maintenance is reviewed by NPPOP-P-NR biologists and coordinated within NPP, NPD and BPA. Certain turbine and spillway discharges at the projects are secondarily used to attract adult fish to the area of fishway entrances, to keep predator fish from accumulating in the area of juvenile release sites and to move juveniles downstream away from the project. The maintenance schedules for these turbines (Appendix E) and spillways will reflect equal weighting given to fish, power and water management and will be coordinated with the appropriate resource agencies. No other fish related restrictions regarding maintenance will be placed on any units at these projects, except to coordinate research activities.

III. John Day Dam.

a. Adult Fish Passage System

1. Fish Passage Season - March 1 through November each year operate according to criteria in Appendix B.

2. Winter Maintenance Season - December 1 through February each year operate according to criteria in Appendix B.

3. Fishway Auxiliary Water Systems

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - The John Day Project has pump style auxiliary water systems. Preventive maintenance and normal repair are normally carried out during the winter maintenance season.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures) - The fishway auxiliary water systems are operated mostly automatically. If the automatic system fails the system can usually be operated manually by project personnel. This will allow the fish facility to operate according to criteria while the automatic system is repaired. When this operation becomes necessary project personnel will increase the surveillance of the adult system to ensure that criteria are being met.

John Day South Ladder - If one of the three fishway auxiliary water turbines fails, assuming all three turbines are being used to meet criteria, bulkheads will be installed in the failed turbine discharge conduit and the output of the two remaining turbines will be increased to bring the fishway into agreement with the adult fishway criteria.

If a second turbine unit fails, bulkheads will be installed in the second failed turbine discharge conduit and the adult fish facility will be operated as follows until a fishway head of 1.2 feet is achieved: (1) Raise the South powerhouse entrance 1 weir (SE1) in one foot increments to 6 feet of depth below the tailwater surface; (2) Raise the north powerhouse entrances (NE1, NE2) in one foot increments to 6 feet of depth below the tailwater surface. (3) Close the center five floating gate submerged orifice entrances starting at the north end (17, 15, 12, 9, 6); (4) Close NE1. (5) If the above criteria is still not achieved leave in this configuration until more auxiliary water becomes available. Then reverse the above procedure.

If all three turbine units fail, bulkheads will be installed in the failed turbine discharge conduit and the adult fish facility will be operated as follows until repairs can be made: (1) SE1 will be open with the weir crest 6 feet below the tailwater surface; (2) Cross channel bulkheads will be placed in the powerhouse collection channel between units 2 and 3. (3) The floating orifice gate in front of unit 2 will be closed, leaving the floating orifice gate in front of unit 1 open.

John Day North Ladder - This system can operate according to the adult fishway criteria under most conditions by using fewer than the six fishway auxiliary water pumps. If one pump fails, one of the standby pumps will be started up. This routine will be followed until the available pumps can no longer meet the adult fishway criteria. When this occurs N2 will be raised in 1 foot increments until a fishway head of 1.2 feet is met or until the weir crest reaches a depth of 6 feet below the tailwater surface. If this fishway criterion is still not met, N1 will be raised in one-foot increments until that criterion is met or the weir crest reaches a depth of 6 feet below the tailwater surface. If criterion is still not achieved close N2 and the N1 weir will be maintained at the six-foot level until repairs reach a stage which allows more water to be added to the system. The weirs should then be opened in the reverse order in which they were closed.

4. Powerhouse and Spillway Adult Fish Collection System

(a) Scheduled Maintenance - (See Appendix A for coordination procedures) Preventive maintenance and repair occurs throughout the year. During the adult fish passage season this maintenance will not involve any operations which will cause a failure to comply with the adult fishway criteria. Inspection of those parts of the adult collection channel systems, which require dewatering such as diffusion gratings, picketed leads and entrance gates, will be scheduled at least once every ten years with at least one underwater inspection in between unless a channel must be dewatered for fishway modifications or to correct observed problems (See Appendix D for dewatering procedures). Inspection by a diver or underwater video system may be used for the underwater inspections. This scheduled inspection and any associated maintenance will occur during the winter maintenance period. Any non-routine maintenance and fishway modifications will be handled on a case by case basis. Corps biologists will be on hand during all dewatering activities as well as during inspection operations to provide fishery input (See Appendix D). However, if a biologist cannot be contacted in an emergency, the project will proceed, using all due care to ensure that fish are not stranded or injured. The project will continue to attempt to contact the biologist.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures). - The John Day Project contains several types of fishway entrances. There is little potential for failure in some of the entrance types while other types do have histories of occasional failure. In most cases when failures occur the entrance can and will be operated manually by project personnel until repairs are made. In those cases in which the failure will not allow the entrance to be operated manually the gate will be maintained, to the extent possible, in an operational position. If this is not possible the entrance will be repaired in an expedient manner (receive high priority) and the entrance will be brought back into manual or automatic control at the earliest possible date.

5. Adult Fish Ladders and Counting Stations

(a) Scheduled Maintenance (See Appendix A for coordination procedures). - The adult fish ladders are usually dewatered (See Appendix D for dewatering procedures) once each year during the winter maintenance period. During this time the ladders are inspected for blocked orifices, projections into the fishway that may injure fish, stability of the weirs, damaged picketed leads, exit gate problems, loose diffusion gratings, unreadable or damaged staff gauges, defective diffusion valves and malfunctioning operating equipment at the counting stations. Problems identified throughout the passage year that do not affect the ladder operation, as well as those identified during the dewatered period are then repaired.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures). - The structures of the ladders include picketed leads, counting stations, fishway exits and overflow weirs with orifices. Picketed leads can cause problems. Pickets with excessive spacing (greater than 1"), erosion of concrete around the picketed leads or missing pickets can allow fish into areas where escape is not possible. In some instances of picketed lead failure there are spare picketed leads and spare installation slots. In these cases the spare leads are installed and the damaged leads are removed and repaired. In the remaining instances of picketed lead failure or concrete erosion, the timing and method of repair will depend upon the severity of the problem. The decision of whether or not to dewater the fishway and repair any problem will be made in consultation with the fishery agencies and Indian tribes, according to the described coordination procedures (Appendix A).

JOHN DAY JUVENILE

B. Juvenile Fish Passage System

(1) Fish Passage Season. April 1 through September each year operate according to the criteria in Appendix C.

(2) Winter Maintenance Period. October 1 through March each year operate according to the criteria in Appendix C.

(3) Submersible Traveling Screens (STS).

(1) Scheduled Maintenance (See Appendix A for coordination procedures) - The STS system will receive preventive maintenance or repair at all times of the year including the winter maintenance period. Whenever a generator malfunctions or is scheduled for maintenance, the three STS' in that turbine may be maintained, repaired or exchanged for other STS needing maintenance or repair. About one third of the STS at John Day are scheduled to get a complete overhaul each year resulting in a three-year maintenance cycle unless future developments indicate that a longer life expectancy is possible.

(2) Unscheduled Maintenance (See Appendix A for coordination procedures) - If an STS is found to be damaged or inoperative in an operating unit refer to Figure 2. During the peak juvenile passage periods (May 1 to September 15), the six days following a juvenile fish release in the John Day pool or when the 24 hour juvenile salmon passage by John Day exceeds 20,000 a crane crew will be taken off lower priority work or will work overtime to remove and replace (if spare available) a damaged or malfunctioning STS or VBS from any unit needed or likely to be needed for power within the next 48 hours. Crews will work overtime or as call-outs on weekends as required.

4. Juvenile Bypass Systems.

(a) Scheduled Maintenance (See Appendix A for coordination procedures) - The John Day juvenile bypass facilities will receive preventive maintenance at all times of the year. During the juvenile fish passage season this will normally be above water work such as maintenance of automatic systems, air lines, electrical systems and monitoring equipment. During the winter maintenance period the system is dewatered downstream of the gatewell orifices. The system is then visually inspected in all accessible areas for damaged equipment and areas that may cause problems to the juvenile fish. Any problems identified are repaired if the project is able, in extreme cases the work will be contracted as soon as possible or repaired during the next winter maintenance period. Modifications and general maintenance to the channel are also completed at this time.

The trash racks are raked just prior to the juvenile fish passage season (April 1) and whenever trash accumlations are suspected because of increased differential across the trash racks or increased juvenile fish descaling

is noted at John Day Dam or increased accumulations of tumbleweeds in the forebay. Additional raking of trashracks may be necessary when a storm brings large quantities of debris down river to the project. The gatewell orifices must be closed during the raking process.

(b) Unscheduled Maintenance (See Appendix A for coordination procedures)

(1) - John Day's juvenile bypass system is controlled by automatic systems. When an automatic system fails it can usually be operated manually. This allows the facility to operate according to criteria while repair of the automatic system is completed. Orifices allow fish out of the gatewells into a bypass channel. When the orifices become plugged with debris they are mechanically cleaned out. The gatewells will be inspected daily and debris removed (debarked) when it covers over one-half of the water surface to maintain clean orifices and minimize fish injury. The gatewell orifices must be closed during the debarking process.

(2) If the bypass system fails in the powerhouse conduit, tainter gate, or transportation outfall making the system unsafe for fish the decision to dewater for repairs will be made in consultation with the fisheries agencies and Indian tribes. During this emergency operating mode, power generation will be minimized. If this operating mode is expected to last longer than four days all units required for generation will be sequentially shut down, fish salvaged from the gate well, the STS removed and the unit restarted. The orifice gates will be closed then opened once each day to float any debris accumulating around the orifice. During fishway inspection activities VBS may be found to be plugged with debris or damaged. In these cases refer to Figure 2.

Figure 2. Operating and Maintenance Instructions in the Event of STS or VBS Failure at John Day Dam.

1. If the project is operating with all available units to meet firm energy demands during low debris conditions continue operating until step 3 can be accomplished, otherwise proceed immediately to step 2.

2. Unit 5 will have high priority and will continue in operation under any load conditions (except during high debris period) with a failed STS or VBS until step 3 can be accomplished. Under high debris load conditions any unit with a failed or malfunctioning STS or VBS will be shut down. If it is the priority unit, the failed STS or VBS will be repaired or replaced within 24 hours. Any other unit with a failed STS or VBS will be shut down until step 3 can be accomplished or that unit is required to meet firm energy demands, in which case that unit will be the last to be brought on line and the first off line.

3. During working hours, assuming the BPA dispatcher will unload John Day on request, the unit will be taken out of service and the failed STS or VBS will be examined. If the required repairs can be accomplished that day, they will be done and the unit may then be returned to service. During the peak juvenile passage period (May 1 - September 15), six days following a juvenile fish release in the John Day pool, or when the 24-hour juvenile salmonid passage by John Day exceeds 20,000, an STS or VBS fails on a unit required for generation, then a crane crew will be taken off all but higher priority work, will work overtime or weekends to remove and replace (if spare available) the damaged or malfunctioning STS orVBS.

4. If repairs require longer than the rest of the day, the STS or VBS will be replaced with a spare or one from a long term out of service unit. If this is not the situation begin removing the replacement STS or VBS from the northernmost unit and move sequentially to the South. STS or VBS should be removed from the A-slot first, B-slot second, C-slot third.

5. All partially screened or unscreened units will be operated according to Appendix C, John Day standards 13 through 17 until a spare or repaired STS or VBS is available for installation.

C. Turbines and Spillways

1. Scheduled Maintenance (See Appendix A for coordination procedures) - The maintenance and routine repair of project turbines and spillways is a regular and reoccurring process which requires that units be shut down for up to two months (see Appendix D for dewatering procedures). The schedule for this maintenance will be reviewed by NPPOP-P-NR biologists and is coordinated within NPP, NPD and BPA. Certain turbine and spillway discharges at the projects are secondarily used to attract adult fish to the area of fishway entrances, to keep predator fish from accumulating in the area of juvenile release sites and to move juveniles downstream away from the project. The maintenance schedules for these turbines (Appendix E) and spillways will reflect equal weighting given to fish, power and water management and will be coordinated with the appropriate resource agencies. No other fish related restrictions regarding maintenance will be placed on any units at these projects, except to coordinate research activities.

FOSTER ADULTS

IV. Foster (adult fish passage facility).

A. Operating criteria.

(1) Head over submerged weirs: 12-15 inches.

(2) Fish ladder flow: 35-39 cfs.

(3) Position of entrance gate and gate opening width: use six-foot gate only, operated as a submerged orifice.

(4) Elevation of surface of entrance pool above tailwater: 12-18 inches.

(5) Number of attraction water pumps used in relation to unit discharge:

(a) Minimum one unit powerhouse discharge (800 cfs) one pump.

(b) Minimum two unit powerhouse discharge (1600 cfs) two pumps.

(c) Powerhouse discharge equal to or in excess of that for two unit rated load at full pool (2200 cfs) - three pumps.

(6) Side entrance gate:

(a) Not operated except under the following conditions: (a) during spill and (b) for one day following the end of spill.

(b) Criteria when operated: Operate as a weir 18 inches above tailwater with approximately 40 cfs discharge from entrance pool.

(7) Maximum flow through spillgate adjacent to fish facility: 2000 cfs.

(8) Criteria shall be checked by operator whenever unit discharge and spill conditions change. In any case, the facility shall be checked to ensure that it is in criteria at least once a day during the peak of the run.

B. Schedule of maintenance (any reference to annual maintenance work means work is done in January). Time required for annual maintenance is usually two weeks. Date will be coordinated with NPPOP-P-NR biologist at least one month prior to dewatering (See Appendix A).

(1) Structure, including holding pool, transportation channel and fish ladder.

(a) Clean, inspect, service and repair annually.

(2) Transfer equipment (includes hopper, craneway hoists, trolley, sweep and brail).

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect, service, and repair electrical system semiannually.

(3) Side gate and entrance gate.

(a) Inspect, service, and repair mechanical system quarterly.

(b) Inspect, service and repair electrical system semiannually.

(4) Inspect, service and repair water supply valves annually.

(5) Valves (E), (F) and (G).

(a) Inspect, service and repair mechanical annually.

(b) Inspect, service and repair electrical system quarterly.

(6) Attraction water pumps nos. (1), (2), and (3) inspection, service and repair—monthly (while fish facility is in operation).

(7) Attraction water pump no. (4) inspection, service and repair - annually (Note: attraction water pumps nos. (1), (2), and (3) are used regularly. Pump no. (4) is used only occasionally as required.)

C. Schedule of facility operation.

(1) Determination of when operation of facility begins and ends requires close coordination (See Appendix A) with the Oregon Department of Fish and Wildlife.

(2) Tentative dates of operation (subject to change depending on presence of fish in river).

(a) Start of operation - February 1.

(b) Shut-down of facility - December 1.

(c) Contingency shut-down - upon request by ODFW and coordinated with NPPOP-P-NR, facility may be shut down to permit chinook, excess to hatchery needs, to be available to the fishery and to allow the fish to hold over in cooler river water. In such a case the facility will be restarted August 15.

(3) In any case, facility must be ready to operate by above mentioned date.

D. Criteria for determining frequency of inspections for fish and removal of fish.

(1) Frequency of inspections - at least once a day.

(2) Number of fish present requiring notification of ODFW personnel within 24 hours is an estimated 50-100.

(3) ODFW personnel will remove fish during peak of run three times/week.

(4) Maximum number of days fish are to be left in facility until ODFW personnel are notified (at beginning and end of run) is four days.

(5) The personnel at South Santiam Hatchery are to be notified concerning removal of fish from facility.

E. Contingencies - preparation for and dealing with major and minor problems.

(1) A major problem is considered to be any failure or problem which completely prevents fish passage for a period of three days or more during the run. (Since the facility has been in operation there has never been a major problem.) The OP-P-NR biologist will be notified as soon as possible when such a problem occurs (see Appendix A).

(a) Routine inspection and overhaul are designed to prevent a major failure of the facility during the fish run.

(b) Should a failure occur during the runs which may be serious enough to become a major problem, all available resources will be used to repair the facility as quickly as possible. This includes the use of overtime which will be authorized. Highest priority will be given to repairing the facility in such a case.

(2) Other problems.

(a) Routine preventive maintenance and minor repairs can usually be done during the fish run while the ladder is still in service. Repairs will usually be completed within two days.

F. Coordination with Oregon Department of Fish and Wildlife and OP-P-NR specific to this Facility concerning situations requiring that ODFW and the OP-P-NR biologist be informed within 24 hours (see Appendix A).

(1) Whenever the salmonid run decreases to a point that fish are no longer entering the facility.

(2) Whenever more than 50 fish are estimated to be present in the facility.

(3) Whenever fish are seen in the river below the facility prior to start of operation for the season.

V. Green Peter (adult fish passage facility).

A. Operating criteria.

(1) Head over weirs: 12-15 inches.

(2) Fish ladder flows: 37-42 cfs (with preference to the lower figure.)

(3) Position of gate: operated as an orifice with bottom sill at elevation 684.5 feet, mean sea level.

(4) Entrance head: 1 foot.

(5) Flow into loading pool: 10-15 cfs.

(6) Brail pool orifice opening widths: 1.2 to 2.2 feet.

(7) Number of attraction water pumps used in relation to unit discharge:

(a) Units not discharging: one pump.

(b) Unit discharging: no pumps as experience has shown that fish do not enter facility when units are discharging.

(8) Criteria shall be checked by operator whenever facility is inspected for numbers of fish present or whenever the project manager considers it necessary due to changing conditions.

B. Schedule of maintenance (any reference to annual maintenance work means work is performed in January and February. Time required for annual maintenance is usually two weeks). Data will be coordinated with OP-P-NR biologist at least one month prior to dewatering (see Appendix A).

(1) Structure, including fish ladder.

(a) Clean, inspect, service and repair annually.

(2) Craneway machinery, hoist and trolley.

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect, service and repair electrical motors quaterly.

(3) Turntable machinery.

(a) Inspect, service and repair mechanical system annually.

(b) Inspect, service and repair electrical system annually.

(4) Brail hoist machinery.

(a) Inspect, service and repair mechanical system quarterly, and more thorough overhaul done annually.

(b) Inspect, services and repair electrical system annually.

(5) Brail pool exit gate.

(a) Inspect, service and repair mechanical system annually.

(b) Inspect, service and repair electrical system annually.

(6) Fish hopper

(a) Inspect, service and repair mechanical system quarterly.

(7) Thirty-six inch main entrance gate.

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect, and repair wire rope semiannually.

(c) Inspect, service and repair electrical system semiannually.

(8) Eighteen inch entrance gate.

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect and repair wire rope semiannually.

(c) Inspect, service and repair electrical system semiannually.

(9) Valves (A) through (H).

(a) Mechnical inspection, service and repair annually.

(10) Valves (C), (D) and (E).

(a) Electrical inspection, service and repair - annually.

(11) Inspect, service and repair attraction water pumps annually (note: because operating criteria has been changed, the pumps are not run as frequently as they had been in the past.)

(a) Inspect, service and repair fish turbine annually.

C. Schedule of operation of facility.

(1) Determination of when operation of facility begins and ends requires close coordination with the Oregon Department of Fish and Wildlife (see Appendix A).

(2) Tentative Dates (subject to change depending on presence of fish in river).

(a) Start operation - February 15.

(b) Shut down of facility - December 15.

(3) Facility must be ready to operate by above mentioned date.

D. Criteria for determining frequency of inspections for fish and removal of fish.

(1) Frequency of inspections - at least once a week.

(2) If fish are present when facility is inspected, they are to be put over the dam after notifying ODFW.

E. Contingencies - preparation for and dealing with major and minor problems.

(1) A major problem is considered to be any failure or problem which completely prevents fish passage for a period of three days or more during the run. (Since the facility has been in operation there never has been a major problem.) The OP-P-NR biologist will be notified as soons as possible when such a problem occurs (see Appendix A).

(a) Routine inspection and overhaul are designed to prevent a major failure of the facility during the fish run.

(b) Should a failure occur during the run which may be serious enough to become a major problem, all available resources will be used to repair the facility as quickly as possible. This includes the use of overtime which will be authorized. Highest priority will be given to repairing the facility in such a case.

(2) Other problems:

(a) Routine preventative maintenance and minor repairs can usually be done during the fish run while the ladder is still in service. Repairs will usually be completed within two days.

F. Coordination with Oregon Department of Fish and Wildlife and OP-P-NR specific to this facility concerning situations requiring that ODFW and the OP-P-NR biologist be informed within 24 hours (see Appendix A).

(1) Whenever, after a period of two weeks after the last steelhead had been put over Foster Dam, fish are no longer entering the facility.

(2) Whenever fish are seen in the river below the facility prior to the start of operation for the season.

GREEN PETER JUVENILE

VI. Green Peter (fingerling fish passage facility).

A. Operating criteria.

1. Flow through fish horn: 190-194 cfs.

2. Flow across separator: 6-10 cfs.

3. The transport pipe will be maintained at a water depth sufficient to transport fish.

4. During periods when the reservoir is filling rapidly due to high flood it may be necessary to take the facility out of service. Rapid filling of the reservoir requires the adjustment of the facility every six hours. In any case, when the reservoir is filling for flood control the lack of flow downstream does not provide adequate transportation for the fingerlings.

5. Whenever the reservoir is being drawn down during the run the facility will be kept operating at all times even if this requires frequent adjustment. It is essential that the fingerlings be permitted to migrate out of the reservoir during these conditions.

6. Criteria shall be checked by operator whenever reservoir conditions change significantly or whenever sampling of fish by ODFW indicates a problem. An alarm will sound in the powerhouse should the pumps cease operation.

B. Schedule of maintenance (any reference to annual maintenance work refers to work done during time facility is not in operation.)

1. Transport pipe valves.

(a) Electrical inspection, service and repair - annual.

2. Internal surface of transport pipe inspection with TV camera - whenever inspection of fingerlings by ODFW personnel indicates injury.

3. Intake gate and hoist.

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect, service and repair electrical system quarterly.

4. Hose cart and hoist.

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect, service and repair electrical system quarterly.

5. Main hoist and main hoist brakes.

(a) Inspect, service and repair mechanical system quarterly.

(b) Inspect, service and repair electrical system quarterly, and a more thorough overhaul annually.

6. Air compressor.

(a) Inspect, service and repair electrical system annually.

7. Attraction water pumps.

(a) Mechnical inspection, service and repair monthly, during fish run.

(b) Electrical inspection, service and repair semiannually, with overhaul as necessary.

C. Schedule of operation of facility.

1. Determination of when operation of facility begins and ends requires close coordination with the Oregon Department of Fish and Wildlife (see Appendix A).

2. Tentative dates (subject to change depending on presence of fish in river).

(a) Start of operation - February 15.

(b) Shut down of facility - June 1.

(c) Start of fall operation - October 25.

(d) Shut down of facility - January 1.

3. Facility must be ready to operate by above mentioned dates.

D. Contingencies - preparation for and dealing with major and minor problems.

1. A major problem is considered to be any failure or problem which completely prevents fingerling passage for a period of three days or more during the run. (There has not been a major problem with the facility since the facility has been put into operation.) The OP-P-NR biologist will be notified as soon as possible after such a problem occurs (see Appendix A). When bypass is operating the facility should be inspected at least twice each week.

(a) Routine inspection and overhaul are designed to prevent a major failure of the facility during the fish run.

(b) Two pumps provide the attraction water. Should one pump fail, the other would be operated to provide some attraction water.

(c) Should a failure occur during the run which may be serious enough to become a major problem, all available resources will be used to repair the facility as quickly as possible. This includes the use of overtime, which will be authorized. Highest priority will be given to repairing the facility in such a case.

2. Other problems.

(a) Routine preventative maintenance and minor repairs can usually be done during the fish run while the facility is still in service.

(b) Vandalism has been a minor problem at the facility. Minor accidents involving debris have occurred.

E. Coordination with Oregon Department of Fish and Wildlife and OP-P-NR specific to this facility concerning situations requiring that ODFW and the OP-P-NR biologist (next working day) be notified within 24 hours (see Appendix A).

1. Whenever high flooding and rapid filling of the reservoir require that the facility to be taken out of service.

2. Whenever there is a malfunction severe enough that any of the facilities are shut down or it would disrupt fingerling or adult passages for more than three days.

APPENDIX A

APPENDIX A
INSPECTION PROGRAM AND COORDINATION

I. Columbia River Projects

A. Inspection Program.

1. During the juvenile fish passage season, the juvenile fish passage facilities will be inspected by project personnel, at least once during each working shift, to assure that the systems are operating according to criteria (see Appendix C for criteria).

2. During the adult fish passage season project personnel will make visual inspections of the adult fish passage facilities each day at daylight and at least once during the day shift (0800-1600 P.S.T.) to assure that the systems are operating according to criteria (see Appendix B for criteria).

3. During both the adult and juvenile fish passage seasons, a Project Operations Division (POD) biologist will inspect the adult and juvenile fish passage facilities at least once a week to assure that the systems are operating according to criteria. This inspection will include contacts with the projects' operations superintendents, fish counters and appropriate researchers conducting work on either the adult or juvenile facilities.

4. During the winter maintenance period, POD biologists will inspect the operating adult and juvenile fish passage facilities at least once every two weeks. All inspectors will ensure with the project that a clearance has been posted on a dewatered facility prior to entering the facility for inspection and will notify the project upon leaving that facility.

5. Just prior to the juvenile fish passage season project personnel will inspect the STS, VBS and gatewell orifices and again at least once every three months at Bonneville Dam and every two months at John Day Dam. Preferrably inspections will occur immediately prior to peaks in juvenile fish migrations. A video monitoring system may be used in these inspections.

6. There will be monthly inspections of project fish facilities by fishery agencies and tribal representatives.

B. Coordination Plan

1. Scheduled Maintenance - Project managers plan in advance for the maintenance activities that are to occur on their respective projects each year. These activities include maintenance of the turbine generators, navigation locks, adult and juvenile fish facilities and the spillway dam. These activities may also include special tasks conducted by the projects for vari

ous research groups. The maintenance for these activities is traditionally set at particular times of the year to coincide with such things as low fish passage, low power demand, low river flows and equal distribution of work load.

The projects' turbine and spillway maintenance schedules will be reviewed annually by NPPOP-P-NR biologist for fishery impacts. The fishway maintenance schedule will be submitted to the NPPOP-P-NR biologist, by 15 September each year, for coordination with NPPPL-FW, the fishery agencies and Indian tribes. Other scheduled maintenance needs are to be coordinated with the NPPOP-P-NR biologist when they may impact the projects' ability to keep the fish facilities operating according to the present fishway operating criteria. The above submittals should take place far enough in advance so that conflicts between fishery needs and required project maintenance can be resolved.

The project fishway maintenance schedules will be considered tentative, but any changes should be coordinated with the NPPOP-P-NR biologist as early as possible. There are many events that could occur during the planned maintenance that should be coordinated with the NPPOP-P-NR biologist. Examples of these are:

(a) Dewatering of turbine intakes and draft tubes.

(b) Closing of fishway entrances

(c) Interruption of auxiliary fishway water

(d) Ladder dewatering or lowering of the water level

(e) Cycling of STS during fish passage season.

2. Unscheduled Maintenance - Unscheduled maintenance or repair will need to be handled by the project manager on a case by case basis using the available information. Unscheduled maintenance or repair is defined as the correction of any situation that impacts fish passage and survival, or impairs the project's ability to operate the facilities according to standard operating criteria. The NPPOP-P-NR biologist must be notified as soon as the need for such work becomes apparent. The project manager has the authority to initiate the work prior to this notification when, in his opinion, delay of the work will result in an unsafe situation for people, property or fish. Information needed by the NPPOP-P-NR biologist in the above coordination includes:

(a) Description of the problem

(b) Type of repair necessary

(c) Length of time for repair

(d) Expected impacts on fish passage

(e) Description of any priority work or situation that prevents the repair from proceeding immediately.

3. The NPPOP-P-NR biologist will be notified when work requested by any entity may impact fish passage or survival. Also notification of the NPPOP-P-NR biologist is strongly recommended when project personnel observe work being conducted by other groups which may impact fish passage. The NPPOP-P-NR biologist must be notified when a malfunction or accident occurs on or near the project which may impact fish passage or survival. Such malfunctions or accidents would include petroleum spills, chemical spills, vehicle accidents or natural disasters.

II. Mid-Willamette Valley Project

A. Coordination with ODFW

(1) Project Manager will coordinate on all matters concerning all fish passage facilities. Project Manager may delegate the responsibility.

(2) Whenever there is a malfunction severe enough that any of the facilities is shut down, ODFW will be notified within 24 hours.

B. Coordination with the District Office biologist (NPPOP-P-NR): The project has the responsibility for operation and maintenance of the facility and coordination with ODFW. It is, however, necessary that the project keep the NPPOP-P-NR biologist informed of all significant circumstances concerning the facility and coordination with ODFW.

1) Whenever the project coordinates with ODFW on significant changes in criteria, the NPPOP-P-NR biologist will be informed of such changes and the reasons for them.

2) The Project will directly inform the District Office within 24 hours of any malfunction during the fish run which would prevent fingerling passage or adult passage for more than three days.

3) Whenever operation of the facility begins, the facility is shut down or malfunctions or there are any significant changes in operation the information will be entered on the teletype and recorded in the station log.

4) The project will directly inform the NPPOP-P-NR biologist whenever a significant or unusual maintenance or repair problem occurs. This is particularily important in the event one of the attraction water pumps at the Green Peter fingerling fish passage facility fails or seems likely to fail.

5) Responsibilities of the District Office:

(a) The District Office will inform the project of any special needs or requests concerning fingerling passage or any other requests pertaining to fish. Such requests will be made in sufficient time that the project may adequately plan the work schedule or as soon as the District Office has received the request from the fisheries agencies.

(b) If needed, the District Office will have the responsibility of obtaining information on work performed on the facility.

APPENDIX B

APPENDIX B
BASIC OPERATING STANDARDS
FOR
ADULT MIGRANT FISH PASSAGE FACILITIES
BONNEVILLE DAM
JANUARY 1986

Prior to March 1 each year

1. Inspect all staff gauges and water level indicators, repair and/or clean where necessary.

2. Inspect dewatered sections of fish facilities for projections, debris or plugged orifices which could injure fish or slow their progress up the ladder. Repair deficiencies.

3. Inspect for and, when necessary, clear debris in the ladder exits.

March 1 through November (Fish Passage Period)
All Adult Fish Facilities

4. Water depth over fish ladder weirs: 1.3 ($\pm$0.1) feet.

5. Head on all entrances: 1.0 to 2.0 feet (1.5 feet prefered). Refer to maintenance plan when unable to achieve head criterion.

6. A transportation velocity of 1.5 to 4 feet per second (2.0 fps prefered) shall be maintained in the powerhouse collection channel, the lower ends of the fish ladders which are below the tailwater, and the adult transportation channel (UMT).

7. Maximum of 6" head on the first powerhouse attraction water intakes and trash racks at all the ladder exits, with a 4" maximum head on all picketed leads. Debris shall be removed when significant amounts accumulate.

8. Staff gauges and water level indicators will be readable at all water levels encountered during the fish passage period.

9. Unit operation priority will be: 10, 9, 1, 18, 17, 11, 2, (3 - 8, and 12). Unit 12 will be used only when required for on going research study. This operation will be followed until the juvenile passage problem (collection efficiency) is resolved at the second powerhouse.

10. Unit 16 will replace units 17 or 18 in the above priority if either of these are taken out of service. Also, unit 2 will replace unit 9 in the above priority when the First Powerhouse bypass channel flow is to the south.

Spillway Ladders

11. Spill bay gates 1 and 18 open 4 inches.

12. Side entrances SW-SG-5 and SO-SG-7 and downstream entrances SW-SG-1 and SO-SG-2 shall operate as free flowing vertical slots. Downstream entrances SW-SG-3 and SO-SG-4 (adjacent to shore) shall close 1 sluice-gate each on rising tailwater elevations from 9.0 to 17.0 and close both sluicegates at each entrance for tailwater elevations above 17.0. The reverse procedure will occur on falling tailwaters at 16.5 and 8.5. This operation should maintain a head of 1.5 feet on the entrances for all tailwater elevations up to 32 feet.

First Powerhouse

13. Entrance gate 65 operates as an adjustable height submerged weir with crest elevation 8 feet below tailwater for tailwater elevations above 17.0, for tailwater elevations below 17.0 the weir is fully lowered with crest at elevation 8.5.

14. Operate powerhouse entrance gates 9, 21, 34, 58 and 62.

15. Orifice A (lower sluicegate) operates from tailwater elevation 7 to 16 on a rising tailwater and elevation 15 to 7 on a falling tailwater.

16. Orifice B (higher telescoping gate) operates from tailwater elevation 16 to 38 on a rising tailwater and elevation 38 to 15 on a falling tailwater.

17. Powerhouse entrance gate 1 operates as an adjustable height submerged weir which acts as the primary control to regulate head differential between the collection channel and tailrace (head on all entrances). Entrance gate 2 is a submerged orifice entrance which operates only when entrance gate 1 is completely lowered to regulate the head differential between the collecion channel and tailrace at lower tailwater elevations. Gate 1 is fully lowered at tailwaters below 22.0, then Gate 2 takes over fishway head regulation.

Second Powerhouse

18. Operate all four North (NUE & NDE) and South (SUE & SDE) entrances. Operate weir crests at elevation 1.0 (full lowered) for tailwater elevations up to 14.0. For tailwater elevations greater than 14.0, operate weir crest 13.0 feet below tailwater.

19. Operate all 12 powerhouse floating orifices.

Spillway Operations

20. The following spill schedules shall be followed during the spill period.

December 1 through February (Winter Operating Period)

21. Operate the adult fish passage facilities according to the fish passage period standards above except systems may be dewatered or operated out of criteria for repair and maintenance. Only one of the ladders servicing the two powerhouses and the associated powerhouse collection system (including the auxiliary water supply system) can be out of service at any one time except under extreme situations. One of the two ladders servicing the spill channel should be in full operation at all times except under extreme conditions.

22. Adjust crowders at fish counting stations to full open at the end of the counting season.

Spill Schedule for Flows at Bonneville Dam
(Gate Opening in dogs) 1/ Revised June 5, 1975 - Reviewed 1985

Gate Number																		Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Dogs	KCFS 2/
4"	1															(1)	4"		
	1	1													(1)	1			
	1	1	1											(1)	1	1			
	1	1	1	1									(1)	1	1	1			
	1	2	1	1									1	1	(2)	1		10	35.3
	1	2	1	1	1							(1)	1	1	2	1			
	1	2	1	1	1	1					(1)	1	1	1	2	1			
	1	2	1	1	1	1	1			(1)	1	1	1	1	2	1			
	1	2	1	1	1	1	1	1		1	(2)	1	1	1	2	1			
	2	2	1	1	1	1	1	1		1	2	1	1	1	2	(2)		20	68.6
	2	2	1	1	1	1	(2)	1	1	1	2	1	1	1	2	2			
	2	2	1	1	1	1	2	2	(2)	1	2	1	1	1	2	2			
	2	2	1	1	1	1	2	3	(3)	1	2	1	1	1	2	2			
	2	2	1	1	2	1	2	3	3	1	2	1	1	1	2	(3)			
	2	2	1	1	2	1	2	4	(4)	1	2	1	1	1	2	3		30	100.8
	2	3	1	1	2	1	2	(5)	4	1	2	1	1	1	2	3			
	2	3	1	1	2	1	3	5	(5)	1	2	1	1	1	2	3			
	2	3	1	1	2	1	3	(6)	5	1	2	1	1	1	3	3			
	2	3	1	1	2	1	3	6	6	1	2	1	1	1	3	(4)			
	2	3	1	1	2	1	4	6	(7)	1	2	1	1	1	3	4		40	139.7
	2	3	1	2	2	1	4	6	7	(2)	2	1	1	1	3	4			
	3	3	1	2	2	1	4	6	7	2	2	1	(2)	1	3	4			
	3	3	2	2	2	1	4	(7)	7	2	2	1	2	1	3	4			
	3	4	2	2	2	(2)	4	7	7	2	2	1	2	1	3	4			
	3	4	2	2	3	2	4	7	7	(3)	2	1	2	1	3	4		50	176.0
	3	4	2	2	3	3	4	7	(8)	3	2	1	2	1	3	4			
	3	4	3	2	3	3	4	7	8	3	(3)	1	2	1	3	4			
	3	4	3	3	3	3	4	7	8	3	3	(2)	2	1	3	4			
	3	4	3	4	3	3	4	7	8	3	3	2	2	(2)	3	4			
	3	4	3	4	3	4	4	7	(9)	3	3	2	2	2	3	4		60	211.5
	3	4	3	4	4	4	4	7	9	(4)	3	2	2	2	3	4			
	3	4	4	4	4	4	4	7	(10)	4	3	2	2	2	3	4			
	3	4	4	4	4	4	4	8	10	4	(4)	2	2	2	3	4			
	3	4	4	4	4	4	4	8	10	5	4	2	(3)	2	3	4			
	3	4	4	4	4	4	4	9	10	(6)	4	2	3	2	3	4		70	246.5
	3	4	4	4	4	4	5	9	10	6	4	(3)	3	2	3	4			
	3	4	4	4	4	4	5	10	10	6	4	3	3	(3)	3	4			
	3	4	4	4	4	4	6	10	11	6	4	3	3	3	3	4			
	4	4	4	4	4	4	6	10	11	(7)	4	3	3	3	3	4			
	4	4	4	4	4	4	6	11	(12)	7	4	3	3	3	3	4		80	281.0
	4	4	4	4	4	5	6	11	12	7	(5)	3	3	3	3	4			
	4	5	4	4	4	5	6	11	12	(8)	5	3	3	3	3	4			
	4	5	4	5	4	5	6	11	12	8	5	(4)	3	3	3	4			

Spill Schedule for Flows at Bonneville Dam (continued)
(Gate Opening in dogs) 1/ Revised June 5, 1975 - Reviewed 1985

Gate Number																		Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Dogs	KCFS 2/
4"	4	5	4	5	4	5	6	12	12	8	5	4	3	3	(4)	4	4"		
	4	5	4	5	4	5	7	12	12	8	5	4	3	(4)	4	4		90	316.1
	4	5	4	5	5	5	7	12	12	8	5	4	(4)	4	4	4			
	4	5	5	5	5	5	7	12	12	8	5	4	4	4	4	(5)			
	4	5	5	5	5	5	8	12	12	8	(6)	4	4	4		5			
	4	5	5	5	5	5	8	12	12	8	6	5	(5)	4	4	5			
	4	5	5	5	5	6	8	12	12	8	6	5	5	4	(5)	5		100	351.2

1/( ) values may be one dog less than value shown.
For example: (1) means 0 or 1 dog, (2) means 1 or 2 dogs, etc.
2/KCFS-approximate values were calculated using a forebay elevation of 76.0 feet.

BASIC OPERATING STANDARDS
FOR
ADULT MIGRANT FISH PASSAGE FACILITIES
THE DALLES DAM
JANUARY 1986

Prior to March 1 each year

1. Inspect all staff gauges and water level indicators, repair and/or clean where necessary.

2. Inspect dewatered sections of fish facilities for projections, debris or plugged orifices which could injure fish or slow their progress up the ladder. Repair deficiencies.

3. Inspect for and, when necessary, clear debris in the ladder exits.

March 1 through November (Fish Passage Period)

All Adult Fish Facilities

4. Water depth over fish ladder weirs: 1.2 feet (±0.1).

5. Head on all entrances: 1.0 to 1.5 feet (prefer 1.3 to 1.5). Refer to maintenance plan when unable to achieve head criteria.

6. A transportation velocity of 1.5 to 4.0 feet per second (prefer 2.0 f.p.s.) shall be maintained in all channels and the lower ends of the fish ladders which are below the tailwater.

7. Maximum of 6" head on attraction water intakes and trashracks at all the ladders exits, with a 4" maximum head on all picketed leads. Debris shall be removed when significant amounts accumulate.

8. Staff gauges and water level indicators will be readable at all water levels encountered during the fish passage period.

9. Main entrance weir depths: 8 feet or greater below tailwater. Weirs will be lowered to bottom when 8 feet depth is not possible.

North Fishway

10. North Fishway Entance: Operate both N-1 and N-2 entrances.

11. South Spillway Entrance: Operate both downstream entrances (S1 and S2).

Powerhouse

12. West Powerhouse Entrance: Operate two entrances (W-1 and W-2).

13. East Powerhouse Entrance: Operate all three entrances (E-1, E-2, E-3) except as required during low tailwater conditions when one entrance may be closed.

14. Operate 11 submerged orifices along the powerhouse collection system. Orifice numbers are: 3, 12, 24, 39, 57, 78, 102, 117, 129, 135, and 136.

15. The cul-de-sac entrance will remain closed to avoid fallout of upstream migrants.

Spillway Operations

16. The following spill schedule shall be followed during the spill period.

December 1 through February (Winter Operating Period)

17. Operate the powerhouse and south spillway adult fish passage facilities according to the fish passage period standards above except the system may be dewatered or operated out of criteria for repair and maintenance. Adjust the fish crowder to full open and pull picketed leads at counting station at the end of the counting season.

18. Operate the north spillway adult fish passage facilities according to the following criteria:

No spill period - operate entrance gate N-1, head attainable by ladder flow only, weir crest 6 feet below tailwater.
Spill period - operate entrance gate N-1, 1.0 foot head weir crests 8 feet below tailwater.
East ladder dewatered or operating out of fish passage period criteria - operate entrance gates N-1 and N-2, 1.0 foot head, weir crest 8 feet below tailwater.

19. Only one of the two fish facilities can be out of service at any one time except under extreme situations.

Spilling Schedule at The Dalles Dam Adjusted for Expanded Powerhouse (openings in feet).

Pool Elevation 159.6'

Gate Number																							kcf's
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
(1)																						1	3.0
1	(1)																				1	1	6.0
1	1	(1)																		1	1	1	9.0
1	1	1	(1)																1	1	1	1	12.0
1	1	1	1	(1)														1	1	1	1	1	15.0
1	1	1	1	1	(1)												1	1	1	1	1	1	18.0
1	1	1	1	1	1	(1)										1	1	1	1	1	1	1	21.0
1	1	1	1	1	1	1	(1)								1	1	1	1	1	1	1	1	24.0
1	1	1	1	1	1	1	1	(1)						1	1	1	1	1	1	1	1	1	27.0
1	1	1	1	1	1	1	1	1	(1)				1	1	1	1	1	1	1	1	1	1	30.0
1	1	1	1	1	1	1	1	1	1	(1)		1	1	1	1	1	1	1	1	1	1	1	33.0
1	1	1	1	1	1	1	1	1	1	1	1	(2)	1	1	1	1	1	1	1	1	1	1	36.0
1	1	1	1	1	1	1	1	1	1	2	1	2	1	(2)	1	1	1	1	1	1	1	1	39.0
1	1	1	1	1	1	1	1	2	1	2	1	2	1	2	1	(2)	1	1	1	1	1	1	42.0
1	1	1	1	1	1	2	1	2	1	2	1	2	1	2	1	2	1	(2)	1	1	1	1	45.0
1	1	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	(2)	1	1	48.0
1		1	1	2	1	2	1	2	2	2	(2)	2	1	2	1	2	1	2	1	2	1	1	51.0
1	1	1	1	2	1	2	2	2	2	2	2	2	(2)	2	1	2	1	2	1	2	1	1	54.0
1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	(2)	2	1	2	1	2	1	1	57.0
1	1	1	1	2	2	2	2	2	2	2	2	(3)	2	2	2	2	2	2	1	2	1	1	60.0
1	1	1	1	2	2	2	2	3	2	3	2	3	2	(3)	2	2	2	2	1	2	1	1	63.0
1	1	1	1	2	2	2	2	3	2	3	2	3	2	3	2	2	2	2	(2)	2	1	1	66.0
1	1	1	1	2	2	3	2	3	2	3	2	3	2	3	2	(3)	2	2	2	2	1	1	69.0
1	1	1	1	2	2	3	2	3	2	3	3	3	2	3	2	3	2	(3)	2	2	1	1	72.0
1	1	1	1	2	2	3	2	3	3	3	3	3	(3)	3	2	3	2	3	2	2	1	1	75.0
1	1	1	2	2	2	3	2	3	3	3	3	3	3	3	(3)	3	2	3	2	2	1	1	78.0
1	1	2	2	2	2	3	2	3	3	3	3	3	3	3	3	(3)	3	3	2	2	1	1	81.0
1	1	2	2	2	2	3	2	3	3	3	3	(4)	3	3	3	3	3	3	2	2	1	1	84.0
1	1	2	(3)	2	3	3	2	3	3	3	3	4	3	3	3	3	3	3	2	2	1	1	87.0
1	1	2	3	2	3	3	2	3	3	4	3	3	3	(4)	3	3	3	3	2	2	1	1	90.0
1	1	2	3	2	3	4	3	4	3	4	3	4	3	4	3	3	3	3	2	2	(2)	1	93.0
1	1	2	3	2	3	4	3	4	3	4	(4)	4	3	4	3	3	3	3	2	2	2	1	96.0
1	1	2	3	2	3	4	3	4	4	4	4	4	(4)	4	3	3	3	3	2	2	2	1	99.0
1	2	2	3	2	3	4	3	4	4	4	4	4	4	4	3	3	3	3	2	(3)	2	1	102.0
1	2	2	3	2	3	4	(3)	4	4	4	4	4	4	4	4	3	3	3	2	3	2	1	105.0
1	2	2	3	2	3	4	4	4	4	(5)	4	5	4	4	4	3	3	3	2	3	2	1	108.0
1	2	2	3	2	3	4	4	5	4	5	4	5	4	4	4	(4)	3	3	2	3	2	1	111.0
		2	3	2	3	4	4	5	4	5	5	5	4	(5)	4	4	3	3	2	3	2	1	114.0
1	2	2	3	3	3	4	4	5	4	5	5	5	(5)	5	4	4	3	3	2	3	2	1	117.0
1	2	3	3	3	3	4	4	5	(5)	5	5	5	5	5	4	4	3	3	2	3	2	1	120.0

Gate Number																							kcf's
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	2	3	3	4	3	4	4	5	5	5	5	5	5	5	4	4	3	3	(3)	3	2	1	123.0
1	2	3	3	4	3	4	5	5	5	5	5	5	5	5	4	4	3	(4)	3	3	2	1	126.0
1	2	3	3	4	4	4	5	5	5	5	5	5	5	5	(5)	4	3	4	3	3	2	1	129.0
1	2	3	3	4	4	5	5	5	5	5	5	5	5	5	5	4	3	4	(4)	3	2	1	132.0
1	2	3	3	5	4	5	5	5	5	5	5	5	5	5	5	4	(4)	4	4	3	2	1	135.0
1	2	3	4	5	4	5	5	5	5	5	5	5	5	5	5	4	(5)	4	4	3	2	1	138.0
1	2	3	4	5	5	5	5	5	5	5	5	5	5	5	5	(5)	5	4	4	3	2	1	141.0
1	2	3	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	(4)	2	1	144.0
1	2	3	4	5	5	5	5	5	5	6	5	5	5	5	5	5	5	(5)	5	4	2	1	146.9
1	2	3	4	5	5	5	5	(6)	5	6	5	6	5	5	5	5	5	5	5	4	2	1	149.7
1	2	3	4	5	5	5	5	6	5	6	6	6	6	(6)	5	5	5	5	5	4	2	1	152.5
1	2	3	4	5	5	5	5	6	6	6	6	6	(6)	6	5	5	5	5	5	4	2	1	155.3
1	2	4	4	5	5	5	5	6	6	6	6	6	6	6	5	5	5	5	5	4	(3)	1	158.3
1	2	4	4	5	5	6	5	6	6	6	6	6	6	6	5	(6)	5	5	5	4	3	1	161.1
1	2	4	4	5	5	6	6	6	6	6	6	6	6	6	(6)	6	5	5	5	4	3	1	163.9
1	2	4	5	2	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	4	3	(2)	166.8
1	2	4	5	2	6	6	6	6	6	6	6	6	6	6	6	6	(6)	5	5	4	4	2	169.7
1	2	4	5	2	6	6	6	6	6	(7)	6	6	6	6	6	6	6	5	5	4	4	2	172.7
1	2	4	5	2	6	6	6	(7)	6	7	6	7	6	6	6	6	6	5	5	4	4	2	175.7
1		4	5	2	6	7	6	7	6	7	6	7	6	(7)	6	6	6	5	5	4	4	2	178.7
1	2	4	5	5	6	7	7	7	7	7	(7)	7	7	7	6	6	6	5	5	4	4	2	181.7
1	2	4	5	5	6	7	7	7	7	7	7	7	(7)	7	6	6	6	5	5	4	4	2	184.7
1	2	4	5	(6)	6	7	7	7	7	7	7	7	7	7	6	6	6	6	5	4	4	2	187.5
1	2	(5)	5	6	6	7	7	7	7	7	7	7	7	7	6	6	6	6	5	5	4	2	190.5
1	3	5	5	6	6	7	7	7	7	7	7	7	7	7	7	6	6	6	5	5	4	2	193.5
1	3	5	5	6	7	7	7	7	7	7	7	7	7	7	7	(7)	6	6	5	5	4	2	196.5
1	3	5	6	6	7	7	7	7	7	7	7	7	7	7	7	7	(7)	6	5	5	4	2	199.4
1	3	5	6	6	7	7	7	7	7	8	7	7	7	7	7	(8)	7	6	5	5	4	2	202.3
1	3	5	6	6	7	7	7	8	7	8	7	(8)	7	7	7	8	7	6	5	5	4	2	205.0
1	3	5	6	6	7	8	7	8	7	8	7	8	7	(8)	7	8	7	6	5	5	4	2	207.8
1	3	5	6	6	7	8	7	8	8	8	(8)	8	7	8	7	8	7	6	5	5	4	2	210.6
1	3	5	6	6	7	8	8	8	8	8	8	8	7	8	7	8	7	6	(6)	5	4	2	213.4
1	3	5	6	7	7	8	8	8	8	8	8	8	7	8	7	8	7	(7)	6	5	4	2	216.4
1	3	5	7	7	7	7	8	8	8	8	8	8	(8)	8	7	8	7	7	6	5	4	2	219.3
1	3	5	7	7	8	8	8	8	8	8	8	8	8	8	(8)	8	7	7	6	5	4	2	222.1

Values in parenthesis may be 1 foot less than the values shown.

For example: (1) mean 0 or 1 foot
(2) means 1 or 2 feet

An approved spill schedule which incorporates raising spillbay gates in blocks of four will be implemented when changes in spill discharge are frequent.

BASIC OPERATING STANDARDS
FOR
ADULT MIGRANT FISH PASSAGE FACILITIES
JOHN DAY DAM
JANUARY 1986

Prior to March 1 each year

1. Inspect all staff gauges and water level indicators, repair and/or clean where necessary.

2. Inspect dewatered sections of fish facilities for projections, debris or plugged orifices which could injure fish or slow their progress up the ladder. Repair deficiencies.

3. Inspect for and, when necessary, clear debris in ladder exits.

March 1 through November (Fish Passage Period)

All Adult Fish Facilities

4. Water depth over fish ladder weirs: 1.2 ($\pm$0.1) feet

5. Head on all entrances: 1.2 to 1.7 feet (prefer 1.5). Refer to maintenance plan when unable to achieve head criteria.

6. A transportation velocity of 1.5 to 4.0 feet per second (prefer 2.0 f.p.s.) shall be maintained in all channels and the lower ends of the fish ladders which are below the tailwater.

7. Maximum of 6" head on attraction water intakes and trashracks at all the ladders exits, with a 4" maximum head on all picketed leads. Debris shall be removed when significant amounts of accumulate.

8. Staff gauges and water level indicators will be readable at all water levels encountered during the fish passage period.

9. Main entrance weir depths: 8 feet or greater below tailwater. Weirs fully lowered when 8 feet depth is not possible.

North Fishway

10. Operate two downstream gates (N1 & N2).

Powerhouse

11. Operate entrances NE-1 and NE-2.

12. Operate ten powerhouse floating orifices (numbers 1,2,3,6,9,12,15,17, 18,19).

13. Operate SE-1.

14. From 0400-2000 P.S.T. operate powerhouse turbine unit #1 near 100 megawatts (±10MW) to facilitate best entrance conditions, unless additional load is required to meet firm energy demands and that load cannot be attained with another fully screened unit.

Spillway Operations

15. The following spill schedule shall be followed during the spill period.

December 1 through February (Winter Operating Period)

All Adult Fish Facilities

16. Water depth over fish ladder weirs: 1.2 feet (±0.1).

17. Only one of the two fish facilities can be out of service at a time except under extreme situations.

18. Main entrance weir depths: 6 feet or greater below tailwater. Weirs fully lowered when 6 feet depth is not possible.

19. Pull picketed leads at counting stations and have crowders adjusted such that the counting slots are fully open at the end of the counting season.

20. Maximum of 6" head on attraction water intakes and trashracks at all ladder exits. Debris shall be removed when significant amounts of accumulate.

North Fishway

21. Operate gate N-1 with N-2 closed with a head of:

a. No spill - that attainable by ladder flow and one auxiliary water pump.

b. With spill - 1.0 foot

c. South ladder dewatered or operating with no auxiliary water flow - 1.0 foot.

Powerhouse

22. Head on all entrances - 1.0 foot

23. Operate NE-2 with NE-1 closed.

24. Operate all ten floating orifices.

25. Operate SE-1

Spill Schedule for John Day Dam (Openings) in stops

Gate Number										
1	2	3	4	5 to 10	11 to 16	17	18	19	20	Kcfs
1									(1)	8.2
1	1							(1)	1	6.4
1	1	1					(1)	1	1	9.6
1	1	2					(2)	1	1	12.8
1	1	2	1			(1)	2	1	1	16.0
1	1	2	2			(2)	2	1	1	19.2
1	2	2	2			2	2	(2)	1	22.4
1	2	2	2	0 or 2	0 or 2	2	2	2	1	60.8
1	2	2	2	(3)	(3)	2	2	2	1	80.0
1	2	3	3	3	3	(3)	2	2	1	84.8
1	2	3	3	3	3	3	(3)	2	1	86.4
1	2	3	3	(4)	(4)	3	3	2	1	105.6
2	3	4	4	(4)	(4)	4	4	3	2	118.4
2	3	4	4	(5)	(5)	4	4	3	2	137.6
2	4	4	5	(6)	(6)	4	4	3	2	160.0
2	4	5	5	6	6	(5)	4	3	2	163.2
2	4	5	6	6	6	5	(5)	3	2	166.4
2	4	6	6	6	6	(6)	5	3	2	169.6
	4	6	6	6	6	6	(6)	4	2	172.8
	4	5	6	(7)	(7)	6	6	4	2	190.4
2	4	6	7	7	7	(7)	6	4	2	195.2
2	4	6	7	(8)	(8)	7	6	4	2	214.4
2	4	6	8	8	8	(8)	6	4	2	217.6
2	4	6	8	(9)	(9)	8	6	4	2	236.8
2	4	6	9	(10)	(10)	8	6	4	2	257.6
2	5	6	9	10	10	(9)	6	4	2	260.8
2	5	6	9	(11)	(11)	9	6	4	2	280.0

Continue as in rows above, opening from ends towards the center and using 1 stop increments on innermost gate of gates 5 to 16 if necessary.

Gates 1, 2, 18, 19, and 20 limits at 9 stops.
Circle values may be 1 stop less than value shown.
Each stop equals about 1.6 kcfs.
Night time spill will follow juvenile spill schedule.

APPENDIX C

APPENDIX C
BASIC OPERATING STANDARDS
FOR
JUVENILE MIGRANT FISH PASSAGE FACILITIES
BONNEVILLE DAM
JANUARY 1986

FIRST POWERHOUSE

Prior to March 15 each year

1. Remove debris from forebay, trashracks and gatewell slots.

2. Inspect vertical barrier screens for damage, holes, debris accumulations or protrusions. (video inspection acceptable) and repair when problem detected.

3. Inspect each Submersible Traveling Screen (STS) and operate on trial run (dogged off at deck level). By March 15, STS in each intake of operational units.

4. Inspect and, where necessary, clean and/or repair all gatewell orifices and orifice lighting systems.

5. Inspect and, where necessary, clean and/or repair dewatering screens and associated equipment.

6. Inspect and correct any deficiencies of DSM channel and conduit walls and floor.

March 15 through September

7. Remove debris from forebay and trashracks as required to maintain less than 1 foot of additional drawdown in gatewell or as indicated by fish condition (i.e., higher than expected descaling). STS in units being raked should be run on continuous during raking operation.

8. Inspect each STS and VBS a minimum of once every three months (video acceptable). Preferably, inspections will occur immediately prior to peaks in juvenile fish migrations. Inspections should be concentrated on the priority units and those others with the longer operating time. More frequent inspections may be required under the following conditions: 1) deterioration of fish condition; 2) increased debris load in bypass system; and 3) other indications of STS or VBS malfunction or failure. If STS or VBS damage or plugging is detected follow procedures in Fish Facilities Maintenance Plan.

9. Operate all gatewell orifice systems. Inspect each daily to assure that the orifice valves and lights are operating correctly. Backflush at least every day or more often if indicated by debris accumulations (Second powerhouse orifices with less than clear flow jet should be cleaned at least once per day). Replace all burned out orifice lights within 24 hours.

10. Inspect each STS amp gauge readings at least once each shift. If an STS failure occurs follow procedures in Fish Facilities Maintenance Plan.

11. Inspect all gatewells daily and clean when gatewell water surface becomes fully covered to maintain clean orifices and minimize fish injury. After debarking a gatewell, backflush (First Powerhouse) or inspect and clean if necessary (Second Powerhouse) the orifice in that gatewell. Check gatewell drawdown.

12. Coordinate cleaning efforts with personnel operating downstream migrant sampling facilities.

13. Turbines should be operated at peak efficiency unless the additional generation is needed to avoid operation of a partially or fully unscreened unit.

14. STS cycling operation may begin when the mean length of the majority of the juvenile chinook passing the project reaches or exceeds 115 mm. This time will be determined by the fisheries agencies and Indian tribes. A cycling time of a maximum 20 minutes off and a minimum of 2 minutes on must be followed. Cycling will be discontinued if warranted by fish condition or debris problems.

15. Inspect and maintain the predator control system.

16. During the period March 15 through April 15 turbine units without a full complement of STS may operate to meet load demands. Exceptions to this are:

a. The day of and four days following juvenile fish releases in the Bonneville pool unscreened units will not operate unless B.P.A. needs that additional generation to meet firm energy demands. The release dates will be supplied to NPPOP-P-NR biologists by the Water Budget Center as soon as these dates are available. The release date must be received by the above biologists one week prior to the release to facilitate necessary coordination to accomplish the unscreened unit shutdown.

b. Unscreened units will not operate when the 24 hour passage by Bonneville exceeds 20,000 juvenile salmon unless B.P.A. needs that additional generation to meet firm energy demands.

Units without a full complement of STS will be the last ones to be brought on line to meet power demands and the first ones off line when the power demand has diminished.

17. During the period April 16 through August turbine units without a full complement of STS will not operate except to meet firm energy demands. Units without a full complement of STS will be the last ones to be brought on line to meet power demands and the first ones off line when the power demand has diminished.

18. During the period September 1 through September operate the same as the March 15 through April 15 period (#16).

19. During periods of involuntary spill open sluicegate 7A to a depth of 3.5 feet and 10C to a depth of 2.5 feet below the minimum expected forebay elevation.

October 1 through March 14

20. All STS removed and D.S.M. channel dewatered (see Appendix E for dewatering procedures). D.S.M. channel will be dewatered throughout most of this period as STS must be stored beneath the intake deck which places the STS directly in front of the gatewell orifices. In addition, follow Bonneville criteria #13.

SECOND POWERHOUSE

Prior to March 15 each year

21. Same as First Powerhouse standards 1 through 6.

March 15 through September

22. Same as First Powerhouse criteria #'s 7 through 15.

23. Operate only turbine units 11, 17 and 18 for adult fish attraction (when necessary, unit 12 may be substituted for unit 11 and unit 16 may be substituted for either units 17 or 18). Operate additional units only as needed for fishery research, or as needed by B.P.A. to meet firm energy demands.

24. Maintain D.S.M. water surface at unit #18 orifices between elevations 64.5 - 65.0.

25. Maintain water surface on dewatering screen between elevations 60.8 - 61.2.

26. Maintain water surface in downwell between elevations 56.5 - 58.0.

October 1 through March 14

27. All STS removed. D.S.M. channel dewatered (see Appendix E for dewatering procedures) only when required for maintenance, the period of maintenance should be minimized to the extent practicable. Additionally all units are available to meet power demands and should be operated at peak efficiency whenever practicable.

BASIC OPERATING STANDARDS
FOR
JUVENILE MIGRANT FISH PASSAGE FACILITIES
THE DALLES DAM
JANUARY 1986

Prior to April 1 each year

1. Remove debris from forebay, trashracks and gatewell slots.

2. Inspect and, where necessary, clean gatewell orifices of debris.

3. Inspect, test and lube chain gates, end gates and hoists for operation as needed.

4. Inspect and correct any epoxy or concrete deficiencies on walls and floors of ice-trash sluice raceway.

April 1 through November 15 (Passage Period)

5. Clean trash racks when drawdown in gatewell slots reaches 1 foot over clean rack drawdown at full load on unit or as indicated by fish condition at Bonneville (i.e., higher than expected descaling).

6. Remove debris from forebay, when needed, and from gatewell slots when gatewell water surface over one-half covered.

7. Operate all gate slot orifices full time.

8. Either turbine unit 1 or unit 2 or both units should be operating during daylight hours (April 1 through June).

9. Operate chain gates 1_1, 1_2, 1_3 - at least 16 hours per day (sunrise to sunset) through August, and at least sunrise to sunset from September 1 on with full surface flow (lower or raise chain gates completely). During periods of involuntary spill, chain gates may be operated continuously.

10. Operate end gate full open from sunrise to sunset.

11. During period when chain gates do not operate set top of bottom end gate at 142 elevation to create orifice plunge pool.

12. Once each week and more frequently if accumulations of debris are observed close gates 1_1, 1_2, 1_3 and open gates 17_3, 18_1, 18_2 for two hours to flush out debris and fish being held in the sluiceway channel east of unit 1.

General

13. During chain gate operation, maintain forebay level above elevation 158.0 to the extent practicable.

14. Maintain orifices clear of debris.

15. Inspect facilities once each shift.

16. Operate turbine units at peak efficiency whenever practicable.

November 15 through March

17. Maintain orifices clear of debris.

18. Set top of bottom end gate at 142 elevation to create orifice plunge pool.

BASIC OPERATING STANDARDS
FOR
JUVENILE MIGRANT FISH PASSAGE FACILITIES
JOHN DAY DAM
JANUARY 1986

Prior to April 1 each year

1. Remove debris from forebay, trashracks and gatewell slots.

2. Inspect all vertical barrier screens for damage, holes, debris accumulations or protrusions (video inspection acceptable) and repair when problem detected.

3. Inspect each Submersible Traveling Screen (STS) and operate on trial run (dogged off at deck level). By April 1, STS in each intake of operational units.

4. Inspect and, where necessary, clean and/or repair all gatewell orifices and orifice lighting systems.

5. Inspect, maintain and, where necessary, repair the D.S.M. conduit tainter gate.

6. Inspect and correct any deficiencies of walls and floor of D.S.M. conduit, raceway, and outfall.

April 1 through September

7. Remove debris from forebay and trashracks as required to maintain less than 1 foot of additional drawdown in gatewell or as indicated by fish condition (i.e., higher than expected descaling). The trashracks for at least units 1, 2, and 3 should be raked again before June 15. Raking should proceed to the north as long as substantial debris continues to be collected. STS in units being raked should run on continuous during raking operation.

8. Inspect each STS and VBS a minimum of once every two months (video acceptable). Preferably, inspections will occur immediately prior to peaks in the juvenile fish migrations. Inspections should be concentrated on the priority units and those others with the longer operating time. More frequent inspections may be required under the following conditions: 1) deterioration of fish condition; 2) increased debris load in bypass system; and 3) other indications of STS or VBS malfunction or failure. If STS or VBS damage or plugging is detected follow procedures in Fish Facilities Maintenance Plan.

9. Operate all gatewell orifices. Inspect daily to assure that the orifice valves and lights are operating correctly. Close and open each orifice every day or as indicated by debris accumulations in the gatewells. Replace all burned out orifice lights within 24 hours.

10. Inspect each STS amp gauge readings at least once each shift. If an STS failure occurs follow procedures in Fish Facilities Maintenance Plan.

11. Inspect all gatewells daily and clean when water surface over one-half covered with debris. After cleaning a gatewell, close and open the orifice at that gatewell. Check gatewell drawdown. Each VBS should be cleaned within three weeks either side of July 1.

12. Coordinate cleaning efforts with personnel operating downstream migrant sampling facilities.

13. Turbines should be operated at peak efficiency unless the additional generation is needed to avoid operation of a partially or fully unscreened unit.

14. STS cycling operation may begin when the mean length of the majority of juvenile chinook passing the project reaches or exceeds 115 mm. This time will be determined by the fisheries agencies and Indian tribes. A cycling time of a maximum 20 minutes off and a minimum of 2 minutes on must be followed. Cycling will be discontinued if warranted by fish condition or debris problems. STS in intakes used for juvenile indexing will run on continuous.

15. During the period April 1 through April turbine units without a full complement of STS may operate to meet load demands. Exceptions to this are:

a. Six days following juvenile fish releases in the John Day pool unscreened units will not operate unless B.P.A. needs that additional generation to meet firm energy demands. The release dates will be supplied to NPPOP-P-NR biologists by the Water Budget Center as soon as these dates are available. The release date must be received by the Corps biologist one week prior to the release to facilitate necessary coordination to accomplish the unscreened unit shutdown.

b. Unscreened units will not operate when the 24 hour passage by John Day exceeds 20,000 juvenile salmon unless B.P.A. needs that additional generation to meet firm energy demands.

Units without a full complement of STS will be the last ones to be brought on line to meet power demands and the first ones off line when the power demand diminishes.

16. During the period May 1 through August turbine units without a full complement of STS will not operate except to meet firm energy demands. Units without a full complement of STS will be the last ones to be brought on line to meet power demands and the first ones off line when the power demand diminishes.

17. During the period September 1 through September operate the same as the April 1 through April period (#15).

October 1 through March

18. All STS removed. D.S.M. channel dewatered (see Appendix D for dewatering procedures) only when required for maintenance, the period of maintenance should be minimized to the extent practicable. Additionally, all units are available to meet power demands and should be operated at peak efficiency whenever practicable.

APPENDIX D

APPENDIX D
DEWATERING PLANS

Adult Fish Ladder

Scheduled Maintenance (See Appendix A for coordination procedures)

1) When possible operate ladder to be dewatered at orifice flow for at least 24 hours but no more than 48 hours prior to dewatering.

2) Discontinue all fishway auxiliary water supply at least 24 hours but no more than 48 hours prior to dewatering.

3) Corps biologist will assure that fish rescue equipment and adequate numbers of personnel will be available to move fish out of the dewatered ladder.

4) Project personnel will install head gates to shut down ladder flow. Where possible, a flow of 1-2 inches will be maintained in the ladder until fish are rescued.

5) At least one Corps biologist will immediately inspect the dewatered ladder and inform the rescue crews of the locations of all stranded fish. A Corps biologist will provide technical guidance on fish safety and assist in the rescue operation. The rescue personnel will then walk the inside of the ladder from the head gates down to tailwater salvaging all fish either by moving fish to tailwater within the ladder flow or capturing and placing the fish in a large water filled tank which is then transported to the forebay or tailwater, whichever is closest, for release.

Unscheduled Maintenance (See Appendix A for coordination procedures)

1) When possible, discontinue fishway auxiliary water and operate ladder at orifice flow as long as possible (prefer 3-24 hours) prior to dewatering.

2) Follow steps 3-5 above.

Scheduled Maintenance (See Appendix A for coordination procedures)

1) During the pumping or draining operation to dewater a portion or all of the collection channel, the water level will not be allowed to drop to a level which strands fish.

2) Corps biologists will assure that rescue equipment is available if needed.

3) A Corps biologist will provide technical guidance on fish safety and assist in any necessary rescue operation.

Turbines (Applies to Bonneville, The Dalles and John Day Dams Only)

1) When possible, place tail logs immediately after turbine unit is shut down if draft tube is to be dewatered.

2) If turbine unit draft tube is to be dewatered and turbine unit has been idle for longer than three hours it will be operated when possible, at "speed/no load" for at least ten minutes and stop logs will then be placed immediately.

3) Water levels in the draft tube will not be allowed to drop to a level which strands fish.

4) Corps biologists will be on site to inspect dewatered turbine draft tubes and intakes as soon as the water levels reach a depth permitting visual inspection and the hatch cover is opened.

5) Corps biologists will assure that rescue equipment is available if needed.

6) A Corps biologist will provide technical guidance on fish safety and assist in any necessary rescue operation.

APPENDIX E

TURBINES USED AT NPP COLUMBIA RIVER
PROJECTS FOR FISH*

Project	Turbine	Dates Required	Remarks
Bonneville	1,2	1 March - 30 November	Used for adult fish attraction to gate 1 and provide flows for juvenile outfall (ice-trash sluiceway) during the interim bypass operation.
	9,10	1 March - 30 November	Used for adult fish attraction to gate 65 and provides flows for the Bradford Island juvenile transportation release site and juvenile bypass outlet.
	11	1 March - 30 November	Used for adult fish attraction to the second powerhouse upstream and downstream shore fishway entrances.
	17,18	1 March - 30 November	Used for adult fish attraction to the second powerhouse upstream and downstream north shore fishway entrances and provides flows for the juvenile bypass outlet.
John Day	1	1 March - 30 November	Used for adult fish attraction to SE 1 and orifice gate 1.

* Overhauls and other planned outages (longer than 1 day) of these units (a maximum of two units per year) will occur during low juvenile and adult fish passage periods (October 15 to March 1) unless specially coordinated.