

REPORT  
OF  
COLUMBIA RIVER TREATY  
CANADIAN AND UNITED STATES ENTITIES  
for the period  
1 October 1969  
to  
30 September 1970

December 1970

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## INTRODUCTION

This report describes the joint actions of the Canadian and United States Entities during the period 1 October 1969 to 30 September 1970, in discharging their responsibility for formulating and carrying out operating arrangements necessary to implement the Columbia River Treaty.

Previous reports on this subject are:-

<u>Period covered</u>	<u>Date of Report</u>
16 September 1964 to 30 September 1967	22 April 1968
1 October 1967 to 30 September 1968	January 1969
1 October 1968 to 30 September 1969	April 1970

## ORGANIZATION AND MEETINGS

The names of the members of the two Entities and their representatives are shown in Appendix A.

During the period 1 October 1969 to 30 September 1970, the Canadian and United States Entities held two regular meetings and Entity representatives and co-ordinators met on four occasions.

The two international committees, listed in Appendix B, which were established effective 19 September 1968, continued their work. These two committees directed and coordinated studies with the support of the staffs of B.C. Hydro and Power Authority, Bonneville Power Administration and the U.S. Corps of Engineers, North Pacific Division.

The Entities received reports and recommendations on operating procedures, facilities and other matters essential to Columbia River Treaty implementation from the international committees. Where necessary, formal agreement on various items was reached by the Entities and Appendix C lists these official agreements reached and recorded during the period of this report.

#### CONSTRUCTION OF THE TREATY STORAGE PROJECTS

Construction work has now been completed on the Duncan and Arrow projects and Mica and Libby construction proceeded on schedule during the year.

During the period of this report, two Columbia Construction Progress reports, Nos. 19 and 20, were issued by B.C. Hydro and Power Authority on the construction of Mica.

The Division Engineer, North Pacific Division, Corps of Engineers, U.S. Army, issued reports Nos. 4 and 5 on the progress of construction during this period of the Libby dam project.

Because these reports give a detailed description of the construction achieved on the projects during this period, it is not considered necessary to repeat the information in this report.

#### COLUMBIA STORAGE OPERATION - OPERATING ARRANGEMENTS

During the period covered by this report, both Duncan and Arrow reservoirs were operated for power and flood control.

The operation of the storages was generally in accordance with:

- (a) "Hydroelectric Operating Plans for Canadian Storage during the Operating Years 1969-70 through 1974-75", dated 15 February 1969, and the amendment thereto dated September 1969.
- (b) "Detailed Operating Plan for Canadian Storage - 1 July 1969 through 31 July 1970", dated 2 October 1969.
- (c) "Detailed Operating Plan for Canadian Storage - 1 July 1970 through 31 July 1971", dated 15 September 1970
- (d) "Interim Flood Control Operating Plan for Duncan and Arrow Reservoirs", dated November 12, 1968.

Attached to this report as Appendix D is "Report on Operation of Columbia River Treaty Projects - 1 August 1969 through 31 July 1970", dated November 1970, which gives a detailed description of the operation of the Treaty storages for the first ten months of the 12-month period of this report.

Prior to 1 October 1969, the Duncan reservoir had been drafted to elevation 1879 ft. Since 1 October 1969, the Duncan reservoir was operated by releases of inflow only until 27 November 1969, when storage release recommenced. Thereafter releases continued from Duncan but, by agreement, were limited to 10,000 cfs, or less, to minimize spill at the Canadian plants on the lower Kootenay River and to obtain maximum usable generation at these plants. On 8 March 1970, the reservoir reached elevation 1802 ft. On 1 April 1970, the Duncan reservoir was at elevation 1804.4 ft. and rising. Normal full pool elevation, 1892.0 ft.

was reached on 26 July 1970. Inflow was passed until 13 September 1970, when storage drafting commenced. On 30 September 1970, Duncan reservoir was at elevation 1886.15 ft.

The initial draft from Arrow reservoir, which commenced on 7 August 1969, was continued to late January 1970, when the lower lake was drawn down to its normal empty elevation of 1377 ft. In the previous year, reservoir preparation work had been postponed because of special operation of Arrow reservoir to facilitate construction of the third powerhouse at Grand Coulee. The Detailed Operating Plan for 1969/70 provided that if physically possible, Arrow reservoir would be maintained empty during the period 1 March 1970 through 31 March 1970, to allow the reservoir preparation work to be resumed.

Further draft was commenced in March 1970, with the aim of lowering the lower lake to about elevation 1374 ft. This was done in order to be able to construct the ferry ramps on the lakes to this lower level.

On 1 April 1970, the Arrow reservoir was at elevation 1373.8 ft. and rising. Filling of the reservoir commenced about 1 May 1970, with elevation 1444 ft. being reached on 10 July 1970.

During the period 11 July 1970 to 18 August 1970, the operating level of the Arrow reservoir was over 1444 ft. This was done in accordance with an agreement made between Bonneville Power Administration and B.C. Hydro and Power Authority and the storage releases during this period were made in a manner which did not conflict with the Detailed



### Operating Plans.

On 18 August 1970, normal storage drafting commenced in accordance with Treaty operating plans. On 30 September 1970, Arrow reservoir was at elevation 1431.95 ft.

### OPERATING COMMITTEE ACTIVITIES

In accordance with its terms of reference the Operating Committee was responsible throughout the year for implementing the current hydroelectric and flood control operating plans for the storage provided in Canada under the Columbia River Treaty. This aspect of the Committee's work is described in Appendix D, "Report on Operation of Columbia River Treaty Projects", dated November 1970.

During the year, the Operating Committee carried out studies necessary for producing the Hydroelectric Operating Plan for Canadian Storage Operating Year 1975-76, and Studies for the Determination of Downstream Power Benefits for 1975-76. The documents covering these studies are referred to in Appendix C of this report.

In addition, studies and a report were made on the Detailed Operating Plan for Canadian Storage - 1 July 1970 through 31 July 1971, on which an agreement was signed in October 1970.

In 1967 a report had been prepared, "Summary Report on the Probabilities of Filling Mica Reservoir", dated June 21, 1967, and in 1970 the Entities decided that it would be desirable to study the question further because the assumptions used in 1967 were probably outdated.

The Operating Committee made studies and produced a report, "Initial Filling of Mica Reservoir", dated September 1970.

During the reporting period members of the Operating Committee considered the possible effects of the present International Joint Commission Order on Kootenay Lake, particularly with respect to the possible releases from the Libby project. Meetings on this subject were held with representatives of West Kootenay Power & Light Company and representatives of the Entities.

#### HYDROMETEOROLOGICAL COMMITTEE ACTIVITIES

The Hydrometeorological Committee held meetings from time to time during the year and proposed an interim plan for hydrometeorological data. This Recommendation "Interim Plan for Exchange of Hydromet Data" dated 28 May 1969, was sent by the Entities to the Permanent Engineering Board on 8 October 1969. After the Board's concurrence with this Recommendation, which was received on 15 June 1970, the Entities signed an official agreement in August 1970\*.

During this reporting period the Hydromet Committee reviewed methods of computation used to derive seasonal volume forecasts. Several minor amendments were submitted to the Operating Committee and adopted.

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\* See Appendix C, item 2



POWER BENEFITS AND FLOOD CONTROL PAYMENTS

Both the Duncan and Arrow storage projects were completed ahead of the dates scheduled under the Columbia River Treaty and as a consequence the United States received additional flood control above that contemplated in the Treaty. Discussions were held between the governments of Canada and the United States during 1968 and as an outcome of the discussions the Government of the United States, in a Note dated 18 August 1969, proposed that the United States should pay to Canada \$82,000 (U.S.A.) for the early completion of Duncan dam and \$196,000 (U.S.A.) for the early completion of Arrow dam. The Canadian Government, in a Note dated 20 August 1969, accepted this proposal and on 7 January 1970, the Government of the United States arranged for payment of these amounts to the Government of Canada. On 8 January 1970, these flood control payments, totalling \$298,241.88 (Canadian) were received by B.C. Hydro and Power Authority.

The Operating Committee produced a report "Determination of Downstream Power Benefits Resulting from Canadian Storage for Operating Year 1975-76", dated June 30, 1970. The Entities signed an agreement on this report on 23 & 25 September 1970\*.

During this reporting year the Canadian entitlement to downstream power benefits from Duncan and Arrow had been purchased by the Columbia Storage Power Exchange and transferred and assigned to the Bonneville Power Administrator. The United States

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See Appendix C, item 3.

Entity delivered capacity and energy to the C.S.P.E. participants in accordance with the Canadian Entitlement Exchange Agreement dated 13 August 1964.

COOPERATION WITH PERMANENT ENGINEERING BOARD

The Entities continued cooperating with the Permanent Engineering Board in the discharge of its functions and a joint meeting of the Permanent Engineering Board and the Entities was held on 18 February 1970.

Semi-annual reports were forwarded by the Entities to the Board covering the period 1 October 1969 to 31 March 1970 and 1 April 1970 to 30 September 1970.

In addition, the construction progress reports - B.C. Hydro's reports Nos. 19 & 20 on Mica, and the Corps of Engineers' Reports Nos. 4 & 5 on Libby, were supplied to the Permanent Engineering Board.

COLUMBIA RIVER TREATY ENTITIES

Canada

THE HON. R.G. WILLISTON  
CHAIRMAN

Director  
British Columbia Hydro and  
Power Authority  
Vancouver, B.C.

Canadian Entity Representative

MR. W.D. KENNEDY

Manager  
Canadian Entity Services  
British Columbia Hydro and  
Power Authority  
Vancouver, B.C.

United States of America

MR. HENRY R. RICHMOND  
CHAIRMAN

Administrator  
Bonneville Power Administration  
Department of the Interior  
Portland, Oregon

BRIGADIER-GENERAL  
ROY S. KELLEY

Division Engineer  
North Pacific Division  
Corps of Engineers, U.S. Army  
Portland, Oregon

United States Entity Coordinators

MR. BERNARD GOLDHAMMER  
COORDINATOR

Asst. Administrator for Power  
Management  
Bonneville Power Administration  
Portland, Oregon

MR. GORDON FERNALD  
COORDINATOR

Chief, Engineering Division  
North Pacific Division  
Corps of Engineers, U.S. Army  
Portland, Oregon

MR. H. KROPITZER  
SECRETARY

Executive Assistant to the Administrator  
Bonneville Power Administration  
Portland, Oregon

Note: For the period 1 October 1969 to June 1970, Mr. G.J.A. Kidd was a Canadian Entity Representative.

COLUMBIA RIVER TREATY  
INTERNATIONAL COMMITTEES

The official membership of the two International Committees for the year 1 October 1969 to 30 September 1970, was as follows:

	<u>Canadian</u> <u>Section</u>	<u>United States</u> <u>Section</u>
COLUMBIA RIVER TREATY OPERATING COMMITTEE	P.R. Purcell* (Chairman)	C.E. Hildebrand (Co-Chairman)(1)
	D.R. Forrest**	D.J. Lewis(1)
	W.E. Kenny	H.M. McIntyre (Co-Chairman)(2)  C.W. Blake(2)
COLUMBIA RIVER TREATY HYDROMETEOROLOGICAL COMMITTEE	P.R. Purcell (Chairman)	F.A. Limpert (Chairman)(2)
	U. Sporns	D.M. Rockwood(1)

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All Canadian committee members represent B.C. Hydro and Power Authority. United States committee members represent (1) United States Corps of Engineers, or (2) Bonneville Power Administration.

\* P.R. Purcell succeeded G.J.A. Kidd - June 1970

\*\* D.R. Forrest succeeded W.H. Fisher - June 1970

APPENDIX C

COLUMBIA RIVER TREATY

OFFICIAL AGREEMENTS OF THE ENTITIES

1 OCTOBER 1969 - 30 SEPTEMBER 1970

<u>Item No.</u>	<u>Date Agreement Signed by Entities</u>	<u>Description</u>
1.	2 December 1969	Columbia River Treaty Detailed Operating Plan for Canadian Storage - 1 July 1969 through 31 July 1970, dated 2 October 1969.
2.	19 & 25 August 1970	Interim Plan for Exchange of Hydromet Data - Recommendation No. 6 - dated 28 May 1969.
3.	23 & 25 Sept. 1970	Determination of Downstream Power Benefits Resulting from Canadian Storage for Operating Year 1975-76 - dated 30 June 1970.
4.	23 & 25 Sept. 1970	Hydroelectric Operating Plan for Canadian Storage Operating Year 1975-76, dated July 1, 1970.

APPENDIX D

"Report on Operation of Columbia River Treaty Projects  
1 August 1969 through 31 July 1970"

dated November 1970

ATTACHED