LEWISTON MORNING TRIBUNE

Section Two — LEWISTON, IDAHO, SUNDAY, SEPTEMBER 22, 1957 — Pages 1 to 10

A Present-Status Look At Revision Of The Columbia Basin 308 Report

(Editor's Note: Nine years ago the U. S. Army Corps of Engineers published its "308 Report" setting forth a plan for comprehensive development of the flood control, hydroelectric power and navigation capabilities of the Columbia River Basin. For more than a year now the corps, on instructions from Congress, has been conducting surveys and hearings for the purpose of revising the plan in the light of up-to-date conditions and needs. On Sept. 6 Brig. Gen. L. H. Foote, Portland, the corps' Pacific Northwest division engineer, gave a report on the status of this revision to a meeting of the Columbia Interstate Compact Commission at Reno. The following is a partial text of his remarks.)

By BRIG. GEN. L. H. FOOTE

I am pleased to give you a brief status report on the current Columbia River review investigation. As you know this investigation is being conducted by the Corps of Engineers, with the assistance of the Bureau of Reclamation, other Federal and State agencies and other interested groups, as a review of our Columbia River "308" Review Report of 1948 which was printed as HD 531. 81st Congress, 2nd Session.

House Document 531 is well known to many of you and I believe it will remain for some time as a very worthwhile document on the water resources of the Columbia River and its tributaries.

Unfortunately with the passage of time, many phases of the report become out of date. A lot has happened in the 10 years since the last report looked into the future. Now it is time to take another look and project our needs a little further into the future based on the conditions as they exist today and what we can see now about tomorrow.

One thing we must all remember —there can be no final long range plan. All plans which project very far into the future must be flexible and planners must be prepared to adjust their sights as conditions change. Their plans must be realigned periodically. Recognizing this, in July 1955, the Committee on Public Works of the United States Senate adopted a resolution requesting the Corps of Engineers to review the report on Columbia River and tributaries published as House Document 531 and other reports "with a view to determining the advisability of modifying the existing project in any way at this time, particularly with regard to present requirements of flood control including consideration of flood storage in Canada; the present needs of navigation; a restudy of hydroelectric power potentialities as part of a combined hydrothermal system; and consideration of all related water uses."

'Re-Establish' Main Plan

The scope of the report this time will be slightly different from that contained in HD 531. While the report will be generally comprehensive in scope in that it will cover the entire field of water resource use, the studies and investigations are being directed primarily toward a review of the Main Control Plan with a view to reestablishing that plan to provide a solution to the main stem flood control problem, possibly extend navigation further inland and to provide an extended plan of power development for the Pacific Northwest.

Problems of a more or less local nature will be considered this time only insofar as they will be affected by the Main Control Plan projects.

I have been asked to speak with particular reference to flood control and navigation which are of primary concern to the Corps of Engineers. Before I talk about those subjects, however, I want to say a few words about power, since "moneywise" the most important use of our water resources is for the generation of hydroelectric power.

The tremendous power potential of the Columbia River has been recognized for a long time. The earliest estimates of future load growth have proven to be very conservative.

In 1931 when the regional power load was in the order of only one million kilowatts, the forecast was for a continued slow increase with a general topping off before the turn of the century at less than 10 million KW. Today we forecast a load of four times that much by the year 2000 with further increases beyond. Today we see ourselves in an age of power and only the harnessing of atomic energy can provide a supply that will meet our rapidly increasing demands.

Here then is the basis for a new concept in the analysis of hydroelectric power. In 1931, when the first Columbia 308 report was prepared, there was no question but that the tremendous hydro power potential of the Pacific Northwest was adequate to meet the future load. In 1948, HD 531 recognized the possibility of needing thermal power in the distant future. Today we can see it just ahead of us if our use of power is to continue to expand.

Today and possibly until around 1975 the Pacific Northwest will be served by essentially a hydro power system. Additional projects will provide added amounts of energy and peaking capacity with steam used only during emergencies and during extremely critical runoff periods. After all the obtainable economic hydro projects are completed it will be necessary to add increasing amounts of thermal generation to meet the growing energy requirements. Additional units will be added at the hydro plants, however, for added peaking capacity and every effort will be made to utilize every drop of water.

Storage will still be required and it may even be more valuable since the load will be so great it will be economical to use all refillable storage every year to reduce the steam fuel consumption. Today we frequently stop our storage drawdown after the winter peak is over and refill up to our flood control rule curves even though we know we will spill water later on.

Eventually, probably around the year 2000, we will find that no more capacity can be installed at our hydro plants and thermal generation will be required to meet the added peak requirements as well as to supply added energy. The limit of our hydro installations will be fixed by operational limitations, as well as physical and economic considerations.

For example, a peaking hydro plant will be called upon for full generation for an hour or so during the day and will run at only partial capacity the rest of the day and evening. Possibly it will be about down to only minimum flows during the low load periods at night so that the pond or reservoir can be refilled for the next day's operation. Most of our major hydro plants will be seriously restricted in such operations because of the resulting adverse effect on navigation and other downstream river uses.

To Insure Full Head

By this third period, our peak loads will be so great that the cheaper capacity sources will be fully utilized and great care will be taken to insure a full head at all storage projects every year during the winter when maximum capacity is required. Storage will be drawn out very judiciously after that time and its use will be somewhat less than before.

This latter period is the one we hear so much about as the time when the value of storage for power will decrease. It appears that the use of storage for power purposes will decrease somewhat in that third period when we have a "steam-hydro" system but before anyone says as a result that storage isn't worth worrying about there are these things to remember.

1. Storage is extremely necessary in the Columbia Basin and will continue to be necessary and valuable for flood control, irrigation and other water conservation purposes.

2. Storage is extremely necessary, up to a certain amount, for power. We probably could effectively use 35,000,000 to 40,000,000 acre foot of storage for the first two periods and we will still be able to use a substantial amount, say 20,000,000 to 25,000,000 acre feet during the third period.

3. It is going to be a relatively long time before the third period occurs and we can get a lot of use out of all the storage we can get until that time.

Flood Control A Must

Insofar as flood control is concerned, there has been little change in basic concept since 1948. Adequate flood control is acknowledged as a must for the Columbia River Basin and it is generally accepted that a combination of levees and reservoirs, accompanied by reforestation and soil conservation practices, is the proper solution.

HD 531 proposed a Main Control Plan which provided, among other things, for approximately 27,000,000 acre feet of active storage, of which nearly 21,000,000 acre feet were used to control the 1894 flood from 1,240,000 cubic feet per second at The Dalles to 800,000 cfs. In addition rehabilitation of existing levees and the construction of some new levees was recommended to provide positive protection against the controlled flow of 800,000 cfs. This was considered a good balance between levees and storage in 1948 and it is still considered a valid objective.

Unfortunately, the storage goal is still unattained. Of the 21,000,000 acre feet of storage in the Main Control Plan we found necessary to control the 1894 flood in HD 531, there is existing today only 5,190,000 acre feet which we can use. The present outlook is that only an additional 4,700,000 acre feet can be expected in the immediately prospective future making a foreseeable total of less than half enough.

Table 1

Table 1 shows the flood control storage of the Main Control Plan of HD 531 distributed by major basins. You will notice that the total storage available for flood control use totals the familiar 27,000,000 acre feet, in round numbers. Similarly, the amount of storage used in that Main Control Plan for control of the 1894 flood to 800,000 cfs at The Dalles totals the familiar 21,000,000 acre feet, in round numbers. I make that last point rather specific because with a Main Control Plan made up of storage in different locations or with a flood of the same magnitude as the 1894 flood but with a different pattern of runoff, we might use something more or less than the 20,890,000 acre feet shown here.

Table 2

Table 2 shows the present control of the Main Control Plan in storage usuable at-site. The notes explain the deficiencies indicated, the details of which you are all generally familiar This represents the situation as we find it today—the present condition from which we must take a new look.

Table 3 shows most of the possible additional storage projects with which we have to work. The 9,000,000 acre feet of storage contained in the first two groups would not be quite enough to provide the complete control envisioned in HD 531. If we are to obtain that goal it is probable that we will need one or more of the more controversial projects shown in the third group—"others," particularly if all the projects in the first two categories are not available.

Table 3

Let me give you a brief run-down on the status of each of the projects listed on Table 3: First, the previously recommended projects on the Clearwater-Bruces Eddy and Penny Cliffs are still awaiting Congressional authorization. As you know, the major objection to the projects come from the conservation interests. It is quite probable that the future of the projects will hinge on the results of fish and wildlife studies which are being made by the U. S. Fish & Wildlife Service and the Idaho Fish & Game Commission.

Briefly the projects under active study shape up as follows:

A. Long Meadows—Yaak River— Field investigations are complete and preparation of the final layout and cost estimate is well along.

B. Spruce Park—Middle Fork of Flathead — The Bureau of Reclamation has completed a reconnaissance study and find that the project probably would be feasible from an engineering and economic standpoint. Reference has been made to the Secretary of Interior as to whether any further study should be made because of objections by conservation interests.

C. Flathead Lake Outlet Improvement—Field and office work nearly complete. The project appears to be economically justified.

D. Buffalo Rapids — Flathead River — Field and office work essentially complete The project is economically justifiable although plan is dependent on the decision yet to be made relative to the conflicting Paradise project.

E. Ninemile Prairie—Blackfoot River—Field and office work completed and the project found economically justified by the Bureau of Reclamation.

F. Enaville—Coeur d'Alene River — Field work completed and office work well advanced. Based on studies to date, the cost of relocations appears to be extremely high and may jeopardize the project justification.

G. Wenaha—Grande Ronde River —Field investigations and surveys completed. Based on present studies, a project appears economically justifiable; however there is a fish and wildlife problem of some magnitude to be solved.

H. Garden Valley—Payette River — Project being studied by the Bureau of Reclamation. Based on studies to date, a project in the interest of irrigation, flood control and power appears justified.

I. Pleasant Valley—Snake River — Application of Pacific Northwest Power Co. for a license to construct the Mountain Sheep and Pleasant Valley project is still before the Federal Power Commission. I understand that the time for filing of exceptions to the Examiner's proposed favorable finding has been extended to late September. I believe this extension was made at the request of the State of Oregon and others.

Of the "other" projects, there is less progress to report.

A. The Chiwawa project on the Wenatchee has been studied by the Chelan County PUD as a possible hydroelectric project. Studies relative to incorporation of flood control features by the Corps of Engineers indicate that economic feasibility is doubtful.

B. Paradise—Clark Fork — Previous plans and data on this project have been reviewed and field reconnaissance made of the reservoir area. The cost estimate is being brought up to date and it appears that the project is economically justified. There is still considerable objection to the project in local quarters and final decision will have to await comparisons with alternate plans and the results of another public hearing which will be held late next month.

C. Libby—Kootenai River—This project which backs water into Canada has been authorized and some planning work done, but the project must be considered on the shelf, for the time being at least, awaiting completion of Canadian plans for development of their portion of the Columbia Basin and an over-all agreement between the two countries on the distribution of costs and benefits. The construction of Libby involves costs in Canada for flowage and relocations. Use of this area, head and water means use of a Canadian resource for the generation of power at-site and downstream, as well as for other purposes. How much of a share has yet to be determinted.

D. Mica Creek and Arrow Lakes are potential developments located entirely in Canada. As investigated by the Canadians, I believe both projects are economically meaisble but the full measure of their feasibility depends on the benefits which accrue downstream in the United States.

Here the problem again is how shall the costs and benefits be shared to the best advantage of the countries. This is a matter that must be negotiated by the two countries and one which is presently under study by the International Joint Commission.

E. Smoky Range on the North Fork of the Flathead River is a very controversial project since it infringes on the Glacier National Park. It is really a modified Glacier View project designed to reduce the adverse effects on the park and its wildlife to a minimum. Because of the violent objections by conservationists to any development in or adjacent to the national park, no detailed studies have been made of this project although preliminary data available indicates it would be economically justifiable by a substantial margin.

F. Nez Perce on Snake River has been in the news a lot lately since it is the large storage project potential in conflict with the Mountain Sheep and Pleasant Valley projects for which a license application is now before the Federal Power Commission.

G. The High Mountain Sheep project, the last project on the list, is another alternate possibility in this same reach. Should a license be granted to the power company by the FPC, it would legally establish the adopted plan of development.

Other studies involve possible developments on Salmon River which could be companion developments to the separate Snake River development. These project potentials are not shown on Table 3 but represent a 4,000,000 acre-foot storage potential through development of a project on Salmon River near its mouth and another farther upstream at the Crevice site referred to in HD 531.

Adequate flood control requires a certain amount of storage. As I mentioned before, HD 531 came up with a Main Control Plan which used about 21,000,000 acre-feet.

The break between minor damage and major damage is at 25 feet on the Vancouver gage. This corresponds to a discharge of about 730,000 cfs at The Dalles and explains in part the reason for selection of 800,000 cfs as our initial goal in HD 531. Control below that amount would produce some additional benefits but the levees and storage contemplated in the Main Control Plan of HD 531 would be credited with better than 90 per cent of benefits obtainable.

Reasonable Distribution

Adequate flood control should include a reasonable distribution of storage also. In effect, we don't want to put all our eggs in one basket. Chart IV illustrates the source of the three major floods we are the most familiar with — that of 1894, 1948 and 1956. You will notice a big similarity in the three diagrams but it does not necessarily follow that the next flood of the 1894 magnitude will follow the same pattern as the last 1894 flood.

Chart V is an "exploded pie" for the 1894 flood. Hatched on the pieces of the pie are the portions of each contribution which would be controlled by the storages in one of our prospective systems, assuming 1985 conditions. As noted on the chart, the single hatching represents control located within the basin itself and the double hatch "bites" represent the control afforded downstream by the main stem projects.

The projects in the system involved include the present outlook storage of 9,890,000 acre-feet shown on Table 2, the recommended Clearwater projects of 3,730,000 acre-feet and the 5,290,000 acre-feet of storage under active study as shown on Table 3. The system then totals 18,910,000 acre-feet of

(Continued on page 5)

TABLE 1

FLOOD CONTROL STORAGE, MAIN CONTROL PLAN

Basin	Project	Stream	Total Storage Available for FC Ac. Ft.	Storage Used to Control 1894 Flood Act. Ft.
Kootenai	Libby	Kootenai R.	4,250,000	3,900,000
Clark Fork	Glacier View	NF Flathead	3,160,000	1,800,000
	Hungry Horse	SF Flathead	2,980,000	2,100,000
	Subtotal		6,140,000	3,900,000
Snake	Palisades	Snake	1,200,000	1,200,000
	Cascade	Payette	650,000	160,000
	Garden Valley	Payette	1,250,000	300,000
	Anderson Ranch	Boise	420,000)	
	Arrowrock	Boise	285,000)	230,000
	Lucky Peak	Boise	295,000)	
	Hells Canyon	Snake	3,280,000	2,600,000
	Subtotal		7,380,000	4,490,000
Columbia	Grand Coulee	Columbia	5,120,000	5,100,000
	Priest Rapids	Columbia	2,100,000	2,100,000
	John Day	Columbia	2,000,000	1,400,000
	Subtotal		9,220,000	8,600,000
Total MCP			26,990,000	20,890,000

TABLE 2

PRESENT STATUS MAIN CONTROL PLAN STORAGE
Flood Control Storage usable at site to control 1894 Flood

Project	Main Control Plan (acre feet)	Present Outlook (acre feet)
Existing		
Hungry Horse	2,100,000	2,100,000
Grand Coulee	1,240,000*	1,500,000 (1)
Palisades	1,200,000 (2)	1,200,000 (2)
Payette & Boise Rivers	390,000	390,000
Subtotal	4,930,000	5,190,000
Additional Proposed in H. D. 531		
Grand Coulee (increase)	3,860,000	2,700,000 (4)
Glacier View	1,800,000	— (5)
Libby	3,900,000 (6)	— (6)
Priest Rapids	2,100,000	500,000 (7)
John Day	1,400,000 (3)	500,000 (8)
Payette & Boise Rivers	300,000	— (9)
Hells Canyon	2,600,000	1,000,000 (10)
Subtotal	15,960,000	4,700,000
Total	20,890,000	9,890,000

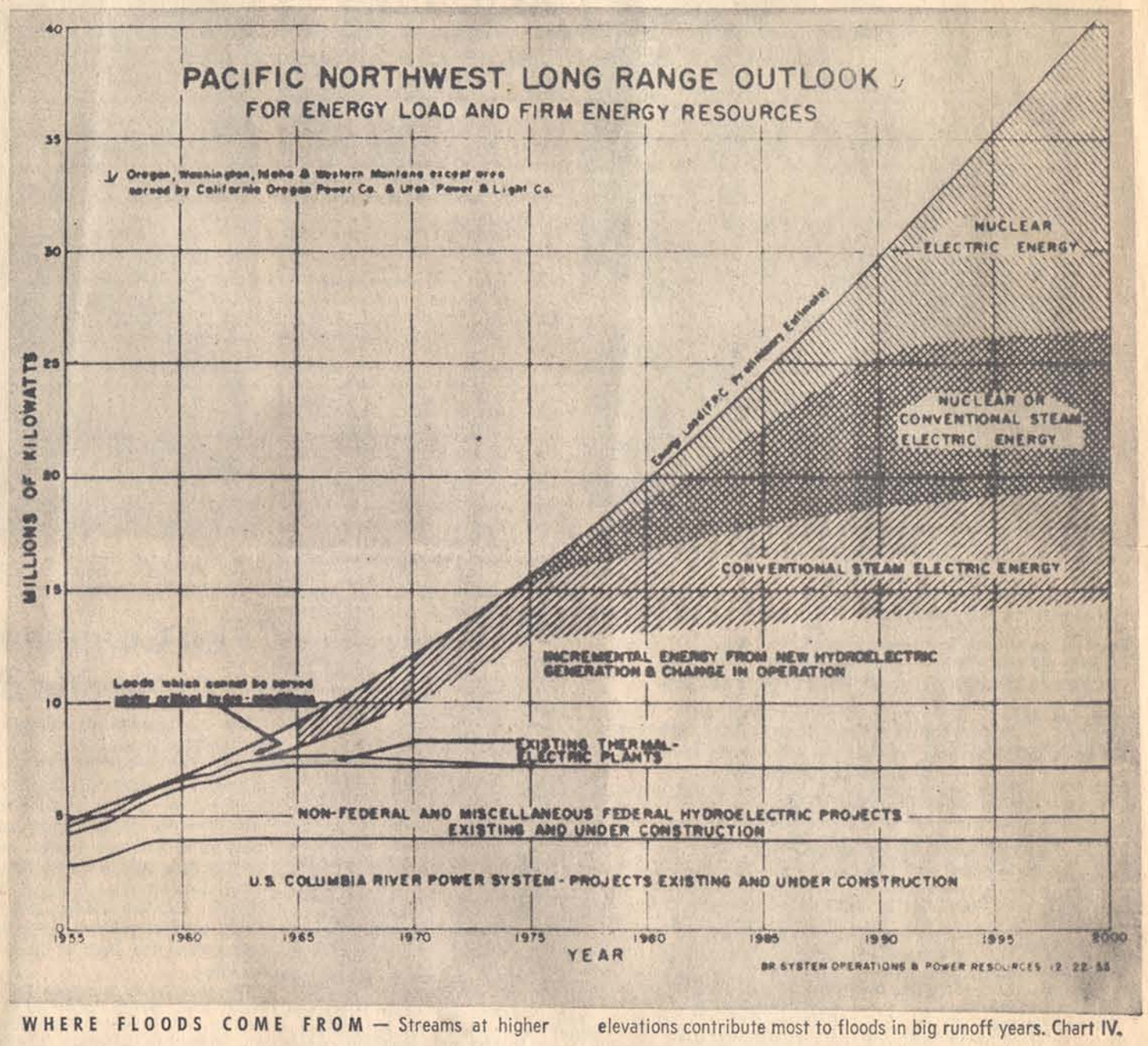
*Amount formerly usable without use of outlets. As previously reported.
(1) Fully usable in 1956 and assumed to be available subsequently through use of 38 of 40 outlets in two top tiers but without additional upstream storage.
(2) Operable for storage in 1957.
(3) 2,000,000 acre feet was available for use as required.
(4) With 60 outlets. Full increase to presently estimated capacity of 5,230,000 acre feet not effective until other major storage above Grand Coulee is developed.
(5) Not recommended because of objections by recreation and wildlife interests.
(6) Authorized but construction delayed pending completion of negotiations with Canada. Current plan (Mile 217) provides for 3,010,000 AF of usable storage.
(7) Alternate 2-dam plan of Grant County PUD No. 2 would provide only 500,000 AF.
(8) Authorized but because of objections to surcharge storage, recommended modification to provide 500,000 AF submitted to Congress.
(9) Recommended Garden Valley project, Payette River, not authorized.
(10) Not authorized. Alternate Brownlee project of Idaho Power Company would provide 1,000,000 AF. Pending Pleasant Valley project would provide additional 500,000 AF if constructed with adequate outlet capacity.

TABLE 3

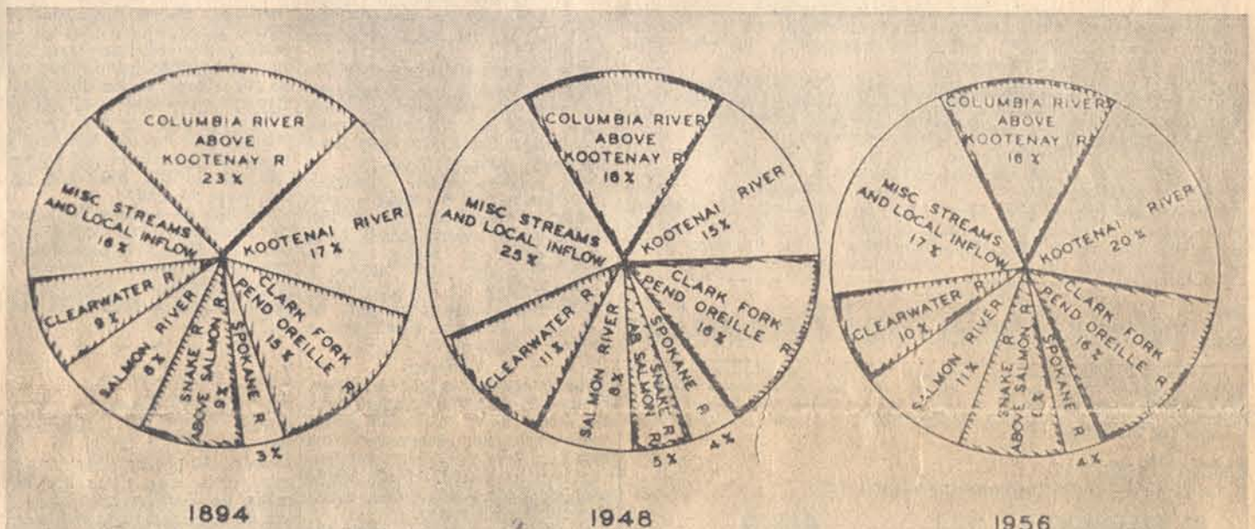
POSSIBLE ADDITIONAL FLOOD CONTROL STORAGE
(Based on studies to April, 1957 — Preliminary data)

PROJECT	STREAM	Total Storage Available (acre feet)	Usable for control 1894 flood to 800,000 cfs at The Dalles (acre feet)
PREVIOUSLY RECOMMENDED			
Bruces Eddy	NF Clearwater	1,430,000	1,430,000
Penny Cliffs	MF Clearwater	2,300,000	2,300,000
TOTAL		3,730,000	3,730,000
UNDER ACTIVE STUDY			
Long Meadows	Yaak River	400,000	400,000
Spruce Park	MF Flathead	300,000	300,000
Flathead Lake Outlet	Flathead	500,000	500,000
Buffalo Rapids	Flathead	670,000	670,000
Ninemile Prairie	Blackfoot	960,000	720,000
Enaville	Coeur d'Alene	700,000	600,000
Wenaha	Grand Ronde	1,000,000	1,000,000
Garden Valley	Payette	1,250,000	* 600,000
Pleasant Valley	Snake	500,000	500,000
TOTAL		6,280,000	5,290,000
OTHERS (Assumed in alternate systems)			
Chiwawa	Wenatchee	150,000	150,000
Paradise	Clark Fork	4,080,000	4,080,000
Libby	Kootenai	5,010,000	**5,010,000
Mica Creek	Columbia in Canada	11,700,000	7,670,000
Arrow Lakes	Columbia in Canada	3,030,000	1,200,000
Smoky Range	NF Flathead	1,500,000	1,500,000
Nez Perce (1490)	Snake	4,120,000	4,120,000
High Mountain Sheep (1490)	Snake	1,600,000	1,300,000

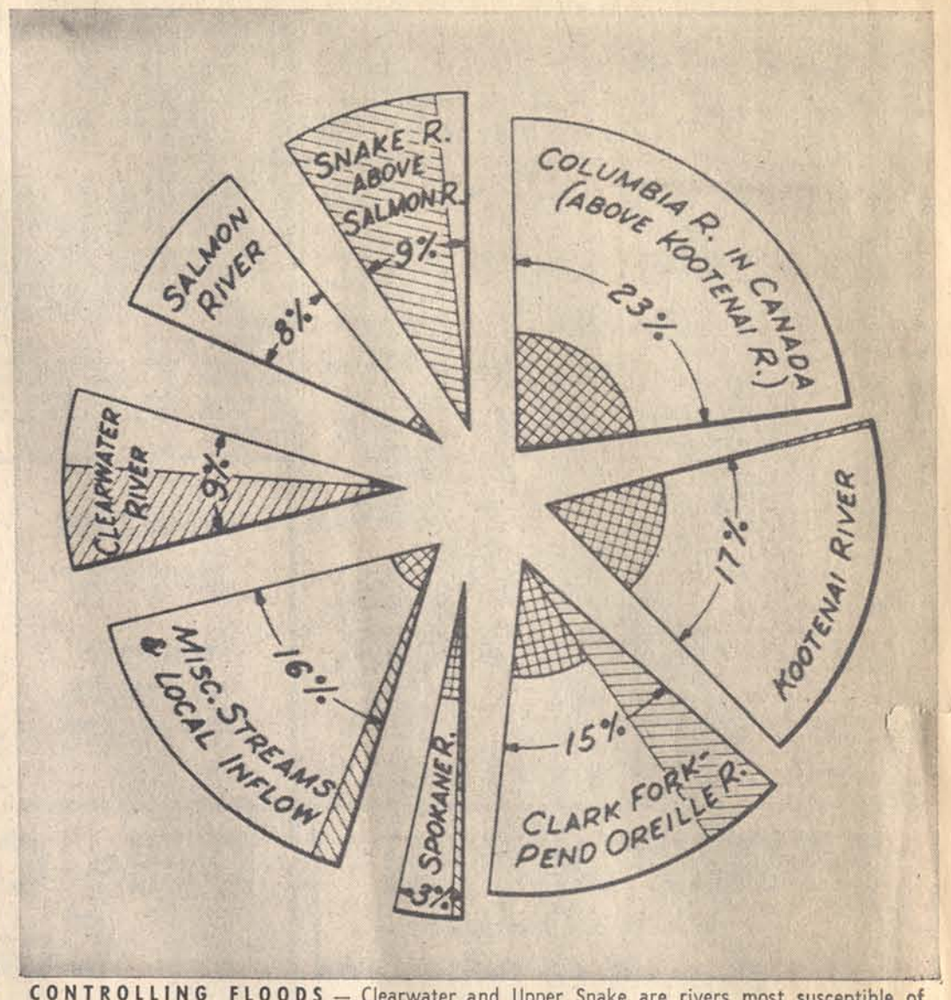
*Garden Valley shown operated for downstream flood control. Only 300,000 acre-feet used in H. D. 531 operated for local flood control with incidental downstream benefits. Similar operation will also increase usable storages at Cascade Reservoir from 160,000 acre-feet to 300,000 acre-feet. Additional 30,000 acre-feet assumed used at Deadwood Reservoir.
**Libby data based on project at Mile 217.9. Modified project since H. D. 531.



WHERE FLOODS COME FROM — Streams at higher elevations contribute most to floods in big runoff years. Chart IV.



POWER OUTLOOK — Graph shows the increasing part atomic energy is expected to play in meeting the power needs of the Pacific Northwest.



CONTROLLING FLOODS — Clearwater and Upper Snake are rivers most susceptible of control within their tributary areas. (Graphs and tables by U. S. Army Corps of Engineers.) Chart V.

Present-Status Of 308 Report

(Continued from page 1)

at-site storage usable for control of this flood. To this was added an equivalent of about 2,000,000 acre feet to represent the irrigation depletions now forecast of about 1985.

Navigation To Lewiston

Before I close I must say a word about navigation. Our current studies include consideration of extending slackwater navigation farther upstream on both the Snake and Columbia Rivers.

For the Snake, it appears that adjustment in the authorized Lower Granite project will improve the navigation facilities at Lewiston and permit the elimination of the low Clarkston dam previously contemplated just above Lewiston. Consequently a single dam at Asotin would provide slackwater to Lime Point, Idaho, (just above the mouth of the Grand Ronde River).

On the Columbia above McNary extended economic studies include a possibility of justifying navigation to Rock Island. Such an extension would require open river improvements to the foot of Priest Rapids Dam and locks at both Priest Rapids and Wanapum. If a dam is constructed in the reach between McNary and Priest Rapids, an additional lock will be required and this possibility is being studied.

At Bonneville studies are being made to determine whether a larger lock should be provided at this time to make this lift comparable with the locks upstream. As you may remember, Bonneville lock was constructed with dimensions of 76 feet by 500 feet with a 24-foot depth over the sills at low water to serve in the 27-foot channel to The Dalles. The upstream projects are designed for barge traffic with dimensions of 86 x 675 feet with 15 feet over the sills. The smaller area at Bonneville will require the larger barge tow that could move through the upper reaches to be broken up for lockage. Consequently, navigation interests have urged consideration of a new lock.

I hope that we can look forward to working further with the Interstate Compact Commission as our report nears completion. If all goes well and adequate funds are made available this year, the report should be completed on schedule by June 1958.