The first Federal flood control statute was the Act of March 1, 1917 on debris control of the Sacramento River. The Mississippi Flood Control Act of May 15, 1928 came next. The major impetus to the program came from a 1936 statute providing that Federal improvements of rivers and other waterways for flood control and allied purposes would be under the jurisdiction of the Army Engineers. (This law should not be confused with the 1935 navigational statute mentioned in the preceding section.)

Flood control projects include local protection projects and flood control reservoirs without power installations. Local protection projects consist of construction of channel improvements, levees, and flood walls. Provision is also made for the removal of accumulated snags and other debris and the clearing and straightening of channels in navigable streams and tributaries when such work is necessary in the interest of flood control. Also included are the construction of emergency bank protection works to prevent flood damage to highways, bridge approaches, and public works, and the construction of small flood control projects not specifically authorized by Congress.

Despite the relatively short history of Federal responsibility for this activity on a national basis, total expenditures by the Army Engineers for flood control construction have soared. Estimated costs are as follows:

<table>
<thead>
<tr>
<th></th>
<th>(Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$5,724.0</td>
</tr>
<tr>
<td>To June 30, 1952</td>
<td>1,347.8</td>
</tr>
<tr>
<td>Fiscal 1953</td>
<td>94.6</td>
</tr>
<tr>
<td>Fiscal 1954</td>
<td>115.8</td>
</tr>
<tr>
<td>Balance to Complete</td>
<td>4,165.8</td>
</tr>
</tbody>
</table>

These amounts are in addition to flood control expenditures by other agencies. The Soil Conservation Service and Forest Service of the Department of Agriculture and the Bureau of Reclamation of the Department of the Interior also share responsibility for flood control activities. The Tennessee Valley Authority has flood control functions in its region, as does the International Boundary and Water Commission.

The laws concerning flood control projects provide for multiple uses, and are substantially like those governing navigation improvements discussed earlier. In addition, the Reclamation Project Act of 1939 provides that a portion of the total estimated construction cost of a Reclamation project may be allocated by the Secretary of the Interior to flood control on a non-reimbursable basis. Such multiple use results in curious inconsistencies. For example, the control of floods is best effected by having empty reservoirs available for the storage of heavy water flows. On the other hand, adequate provision for irrigation or power calls for maximum storage of water. This apparent incompatibility of aims by the different water agencies demonstrates the need for a clarification of Federal water resource policy.
CHAPTER IV

POWER

The whole problem of water resource activities is bound up with the controversial issue of public versus private power. Increasing expenditures of the Bureau of Reclamation, the Bonneville Power Administration, the Southeastern Power Administration, the Southwestern Power Administration, the Tennessee Valley Authority, and the Corps of Engineers bring to the fore the necessity for determination of the appropriate place of the Federal government in the generation and transmission of electric power. No clear-cut power policy has yet evolved; statutes concerning irrigation, navigation, or flood control as primary objectives usually treat electric power as incidental.

Growth of Public Power

Federal participation in the production of electric energy has grown enormously in the past 20 years. In 1933 the Federal government produced 458 million kilowatt hours of electric energy, one-half of 1 percent of the total. In 1950 the Federal government's share was 40,298 million kilowatt hours or 12 percent of the total produced for public use. At the same time the three Federal electric supply systems and ten generating plants of 1932 grew to 55 and 83 respectively in 1950. And, if present plans are fulfilled, the post-war period will also have seen a gigantic increase in the Federal government's share of installed electrical capacity. In 1945, Federal power capacity was 10 percent of the U.S. total; by 1957, it is expected to reach 17 percent. Table 5 traces this growth from 1925 through 1957, according to the best available sources.

In 1951, three Federal agencies—the Bureau of Reclamation, Bonneville Power Administration, and TVA—sold approximately 18 percent of all electric energy sold by the whole electric light and power industry in this country. Power generated at Bonneville and Grand Coulee power plants for the Bonneville Power Administration during fiscal 1952 exceeded 18.5 billion kilowatt hours of electric energy—more than 60 percent of all produced in the 200,000 square-mile Pacific Northwest during the year.

The Army Engineers also participate actively in the Federal government's public power function. The Corps constructs generating facilities for the Southeastern Power Administration, the Southwestern Power Administration, the Bonneville Power Administration, and the Tennessee Valley Authority. Engineer generating capacity of 1.6 million kilowatts on December 31, 1952 (representing more than 15 percent of the Federal total) is scheduled to increase ultimately to 7.5 million kilowatts. New projects proposed in the 1954 Budget alone would add 260,000 kilowatts to this total. Some of the major projects being constructed by the Engineers with their ultimate installed capacity are as follows:

<table>
<thead>
<tr>
<th>Project</th>
<th>Kilowatts</th>
</tr>
</thead>
<tbody>
<tr>
<td>John H. Kerr, Va. and N.C.</td>
<td>204,000</td>
</tr>
<tr>
<td>Clark Hill, Ga. and S.C.</td>
<td>280,000</td>
</tr>
<tr>
<td>Wolf Creek, Ky.</td>
<td>270,000</td>
</tr>
<tr>
<td>Bull Shoals, Ark. and Mo.</td>
<td>320,000</td>
</tr>
<tr>
<td>McNary, Ore. and Wash.</td>
<td>1,127,000</td>
</tr>
<tr>
<td>Chief Joseph, Wash.</td>
<td>1,320,000</td>
</tr>
</tbody>
</table>
Table 5
INSTALLED CAPACITY AND PRODUCTION OF ELECTRIC UTILITIES IN THE UNITED STATES\textsuperscript{a}

End of Selected Years 1925-1957

<table>
<thead>
<tr>
<th>Year</th>
<th>Installed Capacity (Thousands of Kilowatts)</th>
<th>Production of Electric Energy (Millions of Kilowatt Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total U.S.</td>
<td>Federal Amount</td>
</tr>
<tr>
<td>1925</td>
<td>21,472</td>
<td>198</td>
</tr>
<tr>
<td>1930</td>
<td>32,384</td>
<td>226</td>
</tr>
<tr>
<td>1935</td>
<td>34,436</td>
<td>300</td>
</tr>
<tr>
<td>1940</td>
<td>39,927</td>
<td>1,944</td>
</tr>
<tr>
<td>1945</td>
<td>50,111</td>
<td>5,081</td>
</tr>
<tr>
<td>1948</td>
<td>56,560</td>
<td>5,525</td>
</tr>
<tr>
<td>1950</td>
<td>66,919</td>
<td>6,921</td>
</tr>
<tr>
<td>1951</td>
<td>75,775</td>
<td>8,099</td>
</tr>
<tr>
<td>1952</td>
<td>82,117</td>
<td>9,609</td>
</tr>
<tr>
<td>1953\textsuperscript{b}</td>
<td>93,982</td>
<td>11,907</td>
</tr>
<tr>
<td>1954\textsuperscript{b}</td>
<td>105,643</td>
<td>14,883</td>
</tr>
<tr>
<td>1955\textsuperscript{b}</td>
<td>114,514</td>
<td>17,529</td>
</tr>
<tr>
<td>1956\textsuperscript{b}</td>
<td>119,880</td>
<td>19,390</td>
</tr>
<tr>
<td>1957\textsuperscript{b,d}</td>
<td>125,200</td>
<td>21,900</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Does not include production and capacity of industrial electric power plants or stationary power plants of railroads and railways.

\textsuperscript{b} Estimated.

\textsuperscript{c} Not available.

\textsuperscript{d} As of June 30.

Source: Department of Commerce, Edison Electric Institute, Electrical World.
Under the Water Power Act of 1920 and subsequent amendments, the Federal Power Commission has authority to conduct comprehensive river basin studies to determine over-all plans of water resource development for all purposes. These studies, because the FPC is not a construction agency, merely serve as guides in carrying out its regulatory and licensing functions and in making recommendations to other agencies.

The commission has broad authority to conduct investigations and surveys, including power-market studies throughout the country. FPC licensing authority covers waters under the jurisdiction of Congress and public lands. No license is issued for non-Federal development if, in the commission's judgment, the development should be undertaken by the United States. Also, at the end of a license period, not exceeding 50 years, the government has the option of taking over the project at an acquisition price determined under a prescribed formula.

This country is still in the early stage of developing the potential power resources of its great rivers. If Federal expansion continues at the 1933-1954 rate and the Water Power Act is applied broadly, the Federal government may in a few decades produce more than half of our total electric power.

Changing Purpose of Projects

Until construction of the Hoover Dam on the Colorado River, electricity had been a relatively minor part of the Federal reclamation program. Since the completion of that project, many additional river control projects have been constructed. In most of these, hydroelectric power has been an important, if not dominant feature. Power generating equipment has been installed and power marketed in nearly all projects built by the Bureau of Reclamation.

The power features of river basin projects have been extremely controversial. Numerous charges have been made that the Federal program has been subsidized by allocating an unjustifiable proportion of project costs to the non-reimbursable flood control and navigation parts of multiple-purpose projects, thereby permitting lower rates for the power produced. Table 6 shows the tentative allocation of estimated construction costs for selected major reclamation projects.

The first legislation to protect power sites on public lands was passed in 1901. The Federal Water Power Act of 1920 provided for both Federal and non-Federal development of water resources, with a preference to public power applicants. This act is important as the first effort of Congress to express Federal power policy as a whole. Congress' express intent was to encourage private development of water power by facilitating Federal permission for private development under licenses issued by the Federal Power Commission. But the law left the way open for ultimate public ownership. The Boulder Canyon Project Act, signed on December 21, 1928, marked the Federal government's initial undertaking of a truly large-scale multiple-purpose development, with generation of a large block of hydroelectric power for public distribution as one of the major purposes. Thus, the construction of Hoover Dam launched the first comprehensive development of the power resources of a major river basin as part of a multiple-purpose program.

Competition with Private Utilities

The government today generates electric power as a byproduct of water resource projects, builds steam plants for the generation of power, and then transmits and sells both types of power in direct competition with private electric
Table 6

ESTIMATED COST AND TOTAL EXPENDITURES OF MAJOR RECLAMATION PROJECTS

(Millions)

<table>
<thead>
<tr>
<th>Project</th>
<th>Estimated Total Cost as of December 31, 1951</th>
<th>Irrigation</th>
<th>Commercial Power</th>
<th>Navigation and Flood Control</th>
<th>Other</th>
<th>Total Expenditures to June 30, 1952</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulder Canyon</td>
<td>$173.9</td>
<td>--</td>
<td>$148.9</td>
<td>$25.0</td>
<td>--</td>
<td>$165.9</td>
</tr>
<tr>
<td>Central Valley</td>
<td>719.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$239.1</td>
<td>207.8</td>
<td>81.5</td>
<td>$190.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>370.9</td>
</tr>
<tr>
<td>Colorado-Big Thompson</td>
<td>160.1</td>
<td>97.9</td>
<td>60.8</td>
<td></td>
<td>1.4</td>
<td>123.6</td>
</tr>
<tr>
<td>Columbia Basin</td>
<td>698.9</td>
<td>483.1</td>
<td>158.6</td>
<td>1.0</td>
<td>56.2</td>
<td>431.8</td>
</tr>
<tr>
<td>Hungry Horse</td>
<td>108.8</td>
<td>--</td>
<td>89.1</td>
<td>19.7</td>
<td>--</td>
<td>87.7</td>
</tr>
<tr>
<td>Parker-Davis Dam</td>
<td>139.4&lt;sup&gt;c&lt;/sup&gt;</td>
<td>14.2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>101.8</td>
<td></td>
<td>23.4&lt;sup&gt;d&lt;/sup&gt;</td>
<td>132.0</td>
</tr>
</tbody>
</table>

a. Includes Folsom Dam construction costs ($50.8 million) by Corps of Engineers. Detail will not add to total because of rounding.

b. Includes canal capacity and power facilities reserved for future use.

c. Includes $2.8 million reserve for excess costs.

d. Includes $12.4 million furnished by the Metropolitan Water District.

Source: Bureau of Reclamation.
companies. Private companies, in turn, have met the argument that they are unable to satisfy growing power needs by scheduling a doubling of electric power capacity from 1951 to 1960 through an investment of $18 billion.

Public power advocates contend that government power is cheap. Opponents point out that government rates seem cheaper because governmental power agencies pay no taxes. Those arguing for public power also stress the so-called "yardstock theory" to the effect that Federal power rates can be used to measure and thus control private electric rates. Opponents retort that state and local public service commissions effectively regulate electric company rates, and furthermore, any standard of comparison between subsidized, tax-free Federal projects and private companies is initially unfair. Considerable controversy has arisen over the tax-free features of these projects, particularly in areas where taxing utilities have been largely replaced by public power systems.

The Federal government has made some use of the device of payments in lieu of taxes to offset the loss of tax revenues to state and local governments. For example, the Bureau of Reclamation makes an annual payment of $300,000 to Arizona and to Nevada from revenues of the Boulder Canyon project. TVA's fiscal 1952 payment in lieu of taxes amounted to $3 million. This practice, however, is not too prevalent in other projects in other states. The result is that large land areas and projects under Federal control continue to escape state and local taxation.

Another bitter wrangle surrounds the policy of granting preferences in the marketing of Federal-generated power to public bodies, such as municipalities or cooperatives, set up to buy power wholesale for distribution to members on a non-profit basis. For many years, various Federal statutes have provided such preferences. In 1944, Congress prescribed generally that, in the marketing of power generated at reservoir projects under Army control, preference "shall be given to public bodies and cooperatives." Similarly, in the case of reclamation projects, preference "shall be given to municipalities and other public corporations or agencies; and also to cooperatives and other non-profit organizations" financed wholly or partly by Rural Electrification Administration loans. Similar provisions apply at specific projects and in prescribed areas.

Inasmuch as these projects are financed out of general public funds, a policy that siphons off special benefits to a particular portion of the public inevitably becomes subject to attack. The preference clauses, furthermore, have been used as justification for the Federal construction and operation of duplicating electric transmission lines and other facilities. In other words, say opponents, these preference clauses increase pressure for Federal power spending to meet the preferred claim of public bodies and cooperatives, becoming a pretext for additional unnecessary expenditures.

Perhaps the bitterest dispute over public power concerns the government's participation in the building of power transmission lines. This brings into the picture the three power administrations. Southwestern was created to market power from flood control-power dams built by the Army Engineers in the Southwestern states; Southeastern markets power from flood control dams in the southeastern states. Bonneville markets power developed at Reclamation and Engineer generating plants in the Pacific Northwest. By the end of 1954, Federal power lines are scheduled to extend about 25,500 miles.

A losing battle has been fought in many parts of the country to check Federal distribution of power. In many areas, Federal power systems distribute electricity in direct competition with private utility companies. The last Congress,
for instance, heard testimony to the effect that Southeastern's proposed 24-mile line from Clark Hill, S.C. to Augusta, Ga. would "precisely and completely" duplicate an existing transmission line of the Georgia Power Company; that Bonneville's proposed 50-mile line from LaGrande to Baker, Ore. would parallel transmission facilities of the California-Pacific Utilities Co.; that a proposed Southwestern line was unnecessary because there was "already a line in existence" from Bull Shoals Dam, Ark. to the Empire District Electric Co. system.

In this connection, it is worth noting that the appropriation act for fiscal 1952 contained the so-called "Keating amendment" designed to prevent construction of facilities that would duplicate existing adequate transmission lines. The House Appropriations Committee, in reviewing 1954 Budget requests, declared its policy to be as follows: "In all future projects or new starts which include transmission lines, private enterprise shall be urged to take the initiative in constructing, owning, and operating such works before money is made available for Federal construction."

In the Tennessee Valley, strenuous opposition was finally overcome and a complete system of transmission lines and substations was constructed. TVA makes power available to all sections of the valley, but mainly to municipalities or other public power distributors formed to undertake the responsibility of marketing the power to the ultimate consumers. In the Pacific Northwest, it has become generally accepted after years of controversy that the Federal government would construct the main transmission lines with enough secondary lines to make power available to the main load centers. But an intensive contest is still being waged in other parts of the country to check the distribution of Federal power beyond the generating plant, before Federal agencies take over complete control of power marketing.

Another controversy over Federal participation in the production of electrical energy concerns the TVA's requests for funds to build steam generating plants. While TVA maintains the plants are needed in order to have the "firm energy" (available 100 per cent of the time) necessary to meet the demand, opponents have questioned the propriety of this move as an invasion of the province of private industry.

In the Senate Appropriations Committee hearings in 1952, Senator Robertson (Va.) pointed out that, "In the past the steam plant has been urged upon us as a necessary complement to the full utilization of the hydroelectric plant, but ... we are now apparently abandoning that concept. It is not a question of firming up any power from a hydroelectric dam. It is going into the production of power ...

TVA, thus, has gone beyond the mere generation and marketing of hydroelectric power. It has taken over several steam-electric generating plants and has obtained Congressional approval of its use of funds for the construction of such facilities. The 1954 Budget showed estimated obligations of $166 million for continuing construction on seven steam plants and $48 million for beginning new steam plant construction. In fiscal 1952, TVA obligated more than $150 million on steam plants. This is a considerable departure from the incidental disposal of hydroelectric power from other-purpose dams.
Although the use of available water for irrigation is generally considered the primary need in reclamation projects, power as a by-product of reclamation in the multiple-purpose project has assumed a major role in western development. As previously noted, the government's original reclamation policy was broadened when Congress approved the Boulder Canyon Project in December, 1928, for irrigation, flood control, navigation, power and other uses.

Similarly, the projects constructed by the Corps of Engineers are principally for flood control, with provisions for the ultimate installation of electrical generating equipment. But even in certain of these Engineer projects, flood control is not the major consideration. The Alamogordo Dam and Reservoir on the Pecos River, N.M., for example, was to be used "first for irrigation; second, for flood control and river regulation; and, third, for other purposes."

**Missouri Valley Controversy**

The conflict in concepts surrounding multiple-purpose projects is perhaps best typified by the recurring Missouri Valley controversy. In the Spring of 1944, Congress had before it two plans for the development of the Missouri Basin: the Pick Plan, with emphasis on flood control, and the Sloan Plan, with its emphasis on irrigation. Power was incidental to both plans. Because of basic differences in the two approaches, representatives from the Engineers and from Reclamation were appointed to reconcile the engineering features of the two plans. The resulting joint engineering report said certain modifications would eliminate the differences. The report suggested Engineer responsibility for flood control and navigation reservoirs, Reclamation Bureau responsibility for irrigation reservoirs, and mutual recognition of the importance of hydroelectric power.

As thus modified, the Pick-Sloan Plan, under which Missouri River Basin programs were authorized by the Flood Control Act of 1944 and subsequent legislation, divided responsibility between the two agencies for water resource development work within their spheres of interest. Close cooperation between the two agencies was essential in order that the over-all objectives of river basin development be met.

The Bureau of Reclamation claimed that "... a sound workable basis for such cooperation has been established and that accomplishment of work... through cooperation has been standard practice." The Bureau stated that "... cooperation between the Bureau and the Corps in the Missouri River Basin is not merely an attribute of lip service but rather is a positive working force which is continually being refined and perfected."

However, half a dozen years after the Pick-Sloan Plan went into operation, the House Committee which investigated the Kansas-Missouri flood of 1951 was able to make this striking comment: "... the necessary unification and coordination to bring about a satisfactory program in the Missouri Basin has not yet been achieved." The House Appropriations Committee in the last Congress reiterated the belief that, "a program for this basin must be formulated that will allow for an orderly development of the resources of the area without duplication of effort on the part of the various agencies involved."
During Congressional consideration of the Pick and Sloan plans and at other times, proposals for a Missouri Valley Authority (and a Columbia Valley Authority) on lines similar to TVA were also discussed, but no action was taken.

It is believed in some quarters that the TVA-type of approach to water resources development and its relationship with the land, mineral, and forest resources within a given region is the proper path for the government to follow in solving the river basin problem.

The Tennessee Valley is the one region in which the Federal government has come closest to undertaking a unified basin approach to developing and controlling water resources as part of a program designed to assist in the effective realization of a region's economic possibilities. The TVA legislation gave broad regional development duties which included the duty of considering all related resources problems. This is the only case in which a single Federal agency has been charged with planning the development of water, land, and minerals together to improve the economy of a given region. President Truman's Water Resources Policy Commission in 1950 recommended that the TVA approach be followed in other regions, by whatever Federal administrative structure the President and Congress deemed most suitable.

The Hoover Commission Task Force on Natural Resources expressed opposition to the extension of the valley authority type of organization to other river basins. It believed

"... that the administration of national water resource development functions through regular departments of the government would provide greater assurance of similar treatment of similar resource problems throughout the nation than would a regional type of organization; that it would make possible the utilization of central services which would not be afforded in each regional area; that it would make possible the development of standards by which similar programs in many river basins could be measured; that it would operate as a restraint on sectional tendencies which might influence a regional authority to develop regional resources in an manner detrimental to the best national interests."

A major argument against valley authorities is the effect on state prerogatives. Interstate compacts in many areas have been successful in planning and developing regional water resources. Even in the Missouri Basin the Missouri River States Committee representing the ten basin state governments participates in an over-all Missouri Basin Inter-Agency Committee, in development planning with related local government units; the Federal government, through six major departments or agencies; and the farmers and ranchers who own and operate the land and water rights. The committee is not set up by law and exercises no administrative controls. It relies for its effectiveness on the determination of its member agencies, both Federal and state, to work on a voluntary basis toward a common goal. All members participate equally on the committee.

In February of this year, President Truman's Missouri Basin Survey Commission formally presented its report to President Eisenhower, recommending a five-man Federal commission to supervise the over-all development program and coordinate projects now under construction in the basin. The dissenting minority recommended a Federal-state compact. The following were recommended by the commission as a guide to the development of Missouri Basin resources:
1. That the people affected by the program have full opportunity to participate in the formulation and to influence the operation of the program.

2. That the combined efforts of the state and Federal governments be employed in carrying out the program.

3. That each project in the program offer total benefits in excess of cost.

4. That costs be borne in more direct relation to the sharing of the benefits.

5. That the program recognize the basin's limited water supply and the users of water be given preference in this order: domestic and municipal consumption and pollution control; irrigation, hydroelectric power, fish and wildlife; recreation and navigation.

In a message sent to Congress the day before President Truman left office, he said:

"Where states and communities assume a greater share in administrative or planning responsibility, they should also assume greater financial responsibility. . . .

"... The assumption of greater state and community financial responsibility is one of the ways we can avoid irresponsible special pressure for undesirable projects . . . .

"The cost of resource projects should be paid more by those who benefit directly from them . . . ."

In a campaign speech last October, President Eisenhower declared:

"We should not . . . look upon the TVA as a rigid pattern for such development in other regions. In the Missouri Valley, for example, many officials and other thoughtful citizens are considering the possibility of a legal arrangement which would make state and Federal agencies true partners in developing the resources of that great region. We should give all such suggestions serious consideration . . . ."

Some of the interstate compacts that are in the process of being set up or have been set up in recent years are: Columbia River Interstate Compact Commission (Idaho, Montana, Oregon, Washington, Wyoming); Interstate Commission on the Delaware River Basin (New Jersey, New York, Delaware, Pennsylvania); Connecticut River Control Compact (Connecticut, Massachusetts, New Hampshire, and Vermont); Teton River Compact (Idaho and Wyoming); Upper Colorado River Basin Compact (Arizona, Colorado, New Mexico, Utah, and Wyoming); Rio Grande Commission (Colorado, New Mexico, and Texas).

If it is possible for member states to avoid disagreements and stalemates, such compacts can result in balanced programs to supply the water needs of municipalities, agriculture and industry. The commissions created by such compacts can become vital factors in the natural resources development of their regions.
Overlapping of Functions

Inseparably bound up in current water resource programs are the duplication, overlapping of effort, and policy disputes between the Army Corps of Engineers and the Bureau of Reclamation. The Hoover Commission pointed this out in recommending the grouping of rivers and harbors and flood control activities of the Engineers in the Interior Department to eliminate the disastrously wasteful conflict.

The commission spotlighted glaring defects in the organization of water development services in the government. For example, the different plans for the same Hells Canyon, Idaho project by the Corps of Engineers and the Reclamation Bureau cost about $250,000 each. Moreover, they differed in essential particulars of construction and by over $75 million in proposed cost of erection.

The McClellan Committee's report on The Kansas-Missouri Flood of 1951 highlighted the Missouri Basin spectacle of two Federal agencies competing for the construction and operation of projects on the same river and sometimes at the same place. No fully effective method has yet been adopted for reconciling the conflicting programs.

The Hoover Commission Task Force on Natural Resources turned up voluminous data bearing out the fact that both the Army Engineers and the Bureau of Reclamation habitually build projects without sufficient or accurate justifying hydrologic data. The task force admitted that, "So serious are these deficiencies that it is estimated on the basis of experience that the limit of error or ignorance in present water developments is rarely less than 25 per cent, and is frequently greater than that." In other words, government water development agencies are not always sure, before spending their appropriations, that there is even going to be enough water for operation of the projects. Table 2 shows the extent of increases in cost over original estimates in selected Reclamation Bureau projects.

A Congressional investigation into the Engineers civil works program in the first session of the 82d Congress disclosed that out of a total increase of $3 1/4 billion in revised estimates over original estimates of cost, $800 million was attributable to insufficient engineering planning and estimating. Included in these figures are average increases of 177 per cent for relocations of facilities, and 123 per cent in cost and 42 per cent in acreage for land acquisition.

From these and similar disclosures, the Hoover Commission concluded that there is no effective agency for screening and reviewing proposed projects to determine their economic and social worth. Nor is there effective review of the timing of the undertaking of these projects in relation to the economic need or financial ability of the nation. This point is particularly important at the present time.

The recurring debate over TVA-type enterprises pinpoints the differences between the most efficient operation of reservoirs for flood control and their use for power or irrigation. A further reason for unified organization of water development agencies, brought out by the Hoover Commission, is to permit the determination of policies upon a watershed basis, with the participation of the states concerned.

Hoover Commission Proposals

The Hoover Commission estimated that its proposals for sweeping reorganization of the water-resources program, with necessary changes in admin-
istration plus proper planning, could save huge sums annually. As the only remedy for wasteful conflicts in these programs, the commission recommended the consolidation of the Engineers and Reclamation.

The commission's task force report on public works pointed out, furthermore, that the character of the work performed by the Army Engineers is civil rather than military and should be transferred out of the Corps. The Task Force on Natural Resources also indicated that "There is a real question... as to how far these water resource activities are useful in training for war-time problems."

The commission recommended:

1. "... the creation of a Board of Impartial Analysis for Engineering and Architectural Projects which shall review and report to the President and the Congress on the public and economic value of project proposals by the [Interior] Department. The board should also periodically review authorized projects and advise as to progress or discontinuance..."

2. "... that a Drainage Area Advisory Commission be created for each major drainage area, comprising representatives of the proposed Water Development and Use Service of the Department of the Interior, the proposed Agricultural Resources Conservation Service in the Department of Agriculture, and that each state concerned should be asked to appoint a representative. The purpose of these Drainage Boards should be coordinating and advisory, not administrative."

3. "... no irrigation or reclamation project be undertaken without a report to the Board of Impartial Analysis by the Department of Agriculture."

Informed persons familiar with the whole water resource problem have felt that the Board of Impartial Analysis would afford the best possibility for remedying the many defects in water development. It could provide preliminary review of proposed projects and continuing review of the construction and operation of authorized projects.

As recently as last year, the House Appropriations Committee still was able to say:

"... facts point out a vital need for a comprehensive and coordinated program for the development of the water resources of the nation... Despite... recommendations no steps have been taken to formulate an integrated national program for the development of our water resources completely coordinated with all the agencies of the government..."
CHAPTER VI

CONCLUSION

At least three salient factors stand out in any examination of the Federal government's water resource activities. They are: (1) the lack of an over-all coordinated policy; (2) the need for broadening state and local responsibility and participation; and (3) the continuing encroachment upon the traditional preserve of private enterprise. Consequently, the following considerations to which the President's Water Resources Policy Commission directed attention are still valid at the present time:

"1. The extent and character of Federal government participation in major water resource programs.

"2. An appraisal of the priority of water resources programs from a standpoint of economic and social needs.

"3. Criteria and standards for evaluating the feasibility of such projects.

"4. Desirable legislation or changes in existing legislation."

Lack of Coordinated Policy

In the last 50 years, the Federal government has invested tremendous sums in the development of the nation's water resources. The uncoordinated growth of Federal statutes from the original concept of single-purpose development has brought about the assignment of responsibility for specific water uses to a variety of government agencies—with consequent waste and inefficiency. The overlapping and duplication among agencies with divided responsibility is apparent from the following summary of the dispersion of water resource activities among major agencies:

- **Navigation**
  - Engineers, International Boundary and Water Commission, TVA

- **Flood control**
  - Engineers, Agriculture Department (Soil Conservation Service and Forest Service), Reclamation Bureau, International Boundary and Water Commission, TVA

- **Irrigation**
  - Reclamation Bureau, Engineers, Agriculture Department

- **Hydroelectric power**
  - Interior Department (Reclamation Bureau, Bonneville Power Administration, Southwestern Power, Southeastern Power), Engineers, Federal Power Commission, TVA, International Boundary and Water Commission

- **Sanitation**
  - Engineers, International Boundary and Water Commission
The Federal government's transition from a policy of relative non-interference with the natural distribution of water resources to a program of extensive control has occurred with a suddenness that finds the nation lacking policies necessary to insure engineering and economic soundness. The central fact revealed in any study of water resource activities—also recognized by the President's Water Resources Policy Commission—"is the lack of a unified Federal policy respecting the development, utilization, and conservation of water resources, including related uses of land."

Notwithstanding the trend toward comprehensive development of river systems and their watersheds, water resource laws contain repeated instances of lack of statutory coordination. Differing legislative requirements vary with the type of project or the agency made responsible. The steps taken to permit construction of multiple-purpose projects have not harmonized with the underlying bodies of law. Reimbursement requirements, for example, are full of inconsistencies with respect to the various features of such projects. The following list accents the variations in the statutory requirements for different project purposes:

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Reimbursement Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td>Reimbursable without interest.</td>
</tr>
<tr>
<td>Municipal and industrial water</td>
<td>Reimbursable with or without interest if sold directly from storage. Nonreimbursable if benefit accrues from maintenance of stream flow.</td>
</tr>
<tr>
<td>Flood control</td>
<td>Nonreimbursable for storage projects. Local contributions often required for local protective works.</td>
</tr>
<tr>
<td>Navigation</td>
<td>Generally nonreimbursable. Local contributions sometimes required.</td>
</tr>
<tr>
<td>Power</td>
<td>Reimbursable with interest at 3 percent.</td>
</tr>
<tr>
<td>Sediment control</td>
<td>Nonreimbursable except as cost of sediment storage space is allotted to other major functions.</td>
</tr>
<tr>
<td>Salinity and pollution control</td>
<td>Not usually recognized but may be included with other major functions.</td>
</tr>
<tr>
<td>Fish and wildlife</td>
<td>Nonreimbursable.</td>
</tr>
<tr>
<td>Recreation</td>
<td>Usually considered secondary and nonreimbursable.</td>
</tr>
</tbody>
</table>

The Hoover Commission's proposal for an impartial board of review is a concrete effort to counteract the tendency of construction agencies to request authorization of projects based on what appears to be a low estimated cost, and then to increase the estimates later. The various government agencies preparing
plans and estimates for projects often compete in making them as attractive as possible to those primarily benefited. A board of review, objectively divorced from the interests supporting a proposed project, would be able to make the initial screening and at the same time exert a disciplinary effect on the agencies executing the plan over the years.

Such a review board would bring to the Executive and the Congress the differences that might exist in proposals and plans of the various agencies. The importance of such a board is emphasized by the deficiencies in engineering and hydrologic data disclosed by the Hoover Commission. In short, a review board of this nature would serve greatly to eliminate the inconsistencies that appear in the following important steps in the development of river projects: (1) authorization of studies, (2) authorization of projects and appropriations, (3) determination of project feasibility, and (4) submission and review of project reports. The result would be adequate review of projects, not only from a technical point of view, but also in their relation to the economy of the country—and ultimately, uniformity of purpose and emphasis in an over-all coordinated policy.

Need for Proper Allocation of State-Federal Functions

One of the major points made by the Hoover Commission Task Force on Natural Resources in recommending a unified organization of water development agencies to permit the determination of policies upon a watershed basis was that,

"In addition to unification of Federal water development agencies, the relation to, and participation of, the states in water development needs enlargement. . . . The governments of the states involved not only are interested, but also, for some purposes, should be called upon for contribution to expenditure. Nor can too much emphasis be laid upon any one of these multiple uses of water to the prejudice of other states. Moreover, state laws govern water rights.

"Prior to 1936 the states were required to contribute to flood control, but the removal of this condition in 1938 in respect to reservoir projects has, in effect, imposed the whole burden on the Federal government and at the same time removed effective restraints on projects of doubtful feasibility."

The Hoover Commission, to bring about coordination of state interest and the different Federal agencies as well, recommended a Drainage Area Advisory Commission, with representatives from each state concerned.

A number of states, including Wyoming and Montana, have already indicated their willingness and ability to assume more responsibility in dealing with their water resource problems. Primary consideration should certainly be given to the desire of state and local agencies to share in the cost of improvements and provide for their maintenance, either directly or through the medium of interstate compacts.

Encroachment into Area of Private Enterprise

When multiple-purpose dams are built with Federal funds, the Federal government enters the field of economic enterprise, often supplanting or precluding private enterprise. As power is used increasingly to repay the costs of
constructing large projects, the Federal government encroaches more and more onto the preserve of private business.

That this situation is under review was indicated on May 6 by Interior Secretary McKay when he said: "We believe private enterprise where possible should develop rivers of the nation so long as it does not interfere with the orderly development of natural resources." This seems to be a step in the right direction.

* * *

Voluminous hydrologic, engineering, and economic studies have been made on regions, rivers and localities. Nevertheless, the water resource programs continue with the same defects that have marked their conduct for years, almost by default, for lack of any top-level policy decisions as to (1) a proper overall course of action, (2) the proper function of government, (3) the financing of these programs, and (4) a coordinated approach among Federal, state, and local governments and private enterprise. It is to be hoped that any to-be-created Commission on Federal-State Relations or Hoover-type Commission on Federal Functions will give attention and direction to the appropriate role of government in water resources development.