CHAPTER 16

HYDROELECTRIC POWER

16-1. Authority and Corps Responsibilities. Through various statutes, Congress has directed consideration of hydroelectric power in water resource development plans. The Corps formulates comprehensive plans which include development of hydroelectric power by a non-Federal sponsor. Congress has authorized projects that involved hydropower development on the basis of these recommendations.

a. General Responsibilities. The various functions of multiple-purpose water resource development projects are interrelated, and operation for individual functions is coordinated with operation for all functions. The Corps is responsible for insuring the maximum sustained public benefits from each of its projects for all desirable purposes, including power, as integral parts of comprehensive plans for the regulation, control, conservation and utilization of water resources. Consistent with the project authorizations, this is a continuing responsibility throughout the planning, design, construction, and operation phases. Particular attention is given to the operation of projects to obtain the benefits which were anticipated during the planning stages. Within the scope of projects as authorized, the Corps is responsible for determining the proper design and plan of operation for each of its projects so that maximum sustained public benefits will be obtained. Valuable assistance is obtained from other agencies on special aspects such as expected market for power and the value of the power. The Corps must review data and recommendations furnished by others and make such additional investigations as are necessary so that its responsibilities are fulfilled.

b. Additional Responsibilities. Congressional authorizations include the responsibility for the Corps to operate projects under its jurisdiction for all authorized purposes. The Corps is responsible for determining the costs and annual charges of recommended plans of improvement, allocation of those costs and charges to functions served (except where provided otherwise by law), maintaining cost accounting records, maintaining records of project operations, and furnishing others such information as required or appropriate.

16-2. Evaluation. The value of power to the users is measured by the amount that they should be willing to pay for such power. The usual practice is to measure the benefit in terms of the cost of achieving the same result by the most likely alternative means that would exist in the absence of the project. Project capacity benefits are based on the cost of the most likely alternative means of constructing a like amount of capacity financed on the same basis as the Federal project. Energy benefits are based on the expected operating costs of the most likely means of producing a like amount of energy in the absence of the Federal project. Energy benefits assume unregulated fuel prices unconstrained by existing long term contracts and may, where supported, reflect increased costs resulting from relative scarcity. Operating experience indicates that the installed capacity in excess of that considered dependable may have a value. This "intermittent" power capacity is given a value when system operation studies show such capacity has value. Simplified procedures are used for small scale hydroelectric projects (25 MW or less) so that plans for environmentally and economically sound projects may be reported in a

timely fashion. (18 CFR 713.601)

16-3. Cost Sharing. In multiple-purpose reservoirs under the jurisdiction of the Corps, the Chief of Engineers is responsible for determining the costs allocated to the hydroelectric power function, except where otherwise required by law. It is Corps policy that all purposes in a multiple-purpose project should share equitably in the benefits of multiple-purpose development and that no purpose should be subsidized by other project purposes to enable sale of services at lower rates. By the interagency agreement of 12 March 1954, the Federal agencies, Departments of the Interior, Army, and Federal Power Commission (now Federal Energy Regulatory Commission (FERC)) have accepted the Separable Costs-Remaining Benefits (SCRB) method of cost allocation, as a preferred method of distributing project costs. This method permits equitable allocations of project costs to power for use as a basis for establishing power rates.

a. When development of the power function is funded out of project appropriations, the cost (including OMRR&R) allocated to power is fully repaid to the U.S. Treasury by revenues collected by the marketing agency. This is in accord with existing law (see paragraph 16-5) as referenced in subsection 103(c)(1) of WRDA 1986.

b. When development of the power function is funded up-front by a non-Federal sponsor (the preferred option), the allocated investment cost will be recovered by the sponsor under a tri-party agreement between the sponsor, the Corps and the appropriate Federal marketing agency, either through receipt of the developed power or (if specifically authorized by Congress) by repayment from revenues collected by the marketing agency through sale of the power. The allocated share of Corps project OMRR&R costs funded from project appropriations will be repaid to the U.S. Treasury accordingly, either by assessments to the sponsor as costs are incurred or out of the power revenues collected by the marketing agency.

c. A non-Federal sponsor will be required to contribute 50 percent of preauthorization feasibility study costs, during the course of studies.

16-4. Coordination with Other Agencies.

a. The FERC. The FERC, in carrying out its functions under the Federal Power Act, is concerned with all the elements involved in determining power values. The Corps collaborates with the FERC in evaluating power benefits on the basis of unit power values developed by that agency. The Corps Hydroelectric Design Center in the North Pacific Division works closely with FERC on development of power values and can provide assistance, upon request, to Corps FOAs.

b. Others. Federal, state and local agencies which would have an interest in the power function or the possible effect of the contemplated plan, are consulted. Views of interested and affected agencies are considered and covered in Corps reports. Representatives of the marketing agency are consulted.

c. Project Rewind and Uprating. Consultation with other agencies is required for rewind and uprating of hydroelectric generators carried out in the maintenance, rehabilitation, and modernization of existing generating facilities at water resources

Comment [COMMENT1]: A question has come up regarding the possibility of a non-Federal user obtaining a FERC license at a Corps project. Is that user required to repay a portion of the original project, what would now be joint costs had the original authorization included hydropower? If not, the original purposes would be subsidizing the non-Federal hydropower development at the site.

Comment [COMMENT2]: Non-Federal project development financing usually includes a sizable budget for the pre-construction costs associated with obtaining a FERC license, passing all of the Federal and state regulatory hurdles, etc. The language of paragraph 16.3.c. could be interpreted to mean that the non-Federal developer cannot recapture these costs (which can run into the millions) through the subsequent sale of power. This is not correct, there is no direct reimbursement, but the costs are recoupable. This point is probably best left to the more extensive ER rather than the digest.

projects. The Secretary of the Army shall provide affected state, tribal, and Federal agencies with a copy of the proposed determinations that the proposed actions are economically justified and financially feasible; will not result in significant adverse affect on other project purposes; will not result in significant adverse environmental impacts; will not involve major structural or operational changes in the project; and will not adversely affect the use, management, or protection of existing Federal, state, or tribal water rights. If the agencies submit comments, the Secretary shall accept those comments or respond in writing to any objections raised to the proposed determinations. (Section 216 of WRDA 1996)

16-5. Marketing of Corps-Produced Power.

a. Under the provisions of Section 5 of the Flood Control Act of 1944 (Public Law 534, 78th Congress) and other acts, power developed at projects under the jurisdiction of the Chief of Engineers, which is surplus to project needs, is turned over to the Secretary of Energy for marketing. Law requires that the Secretary of Energy shall transmit and dispose of Federal power and energy so as to encourage the most widespread use at the lowest possible rates to consumers, consistent with sound business principles. It also provides that, in the sale of power, preference is given to public bodies and cooperatives. Agencies of the Department of Energy which market the power are: The Bonneville Power Administration, Southwestern Power Administration, Southeastern Power Administration, the Western Area Power Administration and the Alaska Power Administration. Rates for sale of power to recover allocated costs are established by the marketing agency of the Department of Energy and approved by the FERC. The marketing agency is required to so establish the rates as to recover the cost of producing and transmitting the power, including repayment of the Federal investment, over a reasonable period of years (50 years is established by the Secretary). (ER 1130-2-510)

b. If development of the power is funded by a non-Federal sponsor, the power must still be marketed by the appropriate Federal marketing agency pursuant to Federal law. Repayment of the sponsor's investment will be pursuant to a tri-party agreement between the sponsor, Corps and marketing agency (the period of recovery should not exceed 50 years).

c. Marketing of power produced from FERC licensed power plants at Corps projects is the responsibility of the licensee. The Corps and the Federal marketing agencies are not involved in the related marketing arrangements. See paragraph 16-9.

16-6. Pumped Storage Power. Possibilities for pumped storage developments are investigated in pre- and postauthorization planning studies for the optimum development of water resources. Where potentials exist, the engineering and economic aspects are reported to a degree consistent with the nature and scope of the report.

a. Integral Facilities. Integral facilities (usually a conventional powerhouse with reversible units) are considered in reports and recommended as a part of a Federal project when such facilities are justified and represent the best development of the site. Adjoining plants (usually detached plants using the reservoir for an afterbay) which are similarly qualified, and the operations of which would have a significant interrelation with other project

operations, may also be included in the recommended plan.

b. Adjoining Plants. Reports also take note of other possible adjoining pumped storage plants which might be developed near a Federal project but which do not appear to require operation as an integral part of the proposed Federal project. They are not generally included as part of a Federal plan. Non-Federal interests may wish to consider the construction of adjoining plants that could be operated relatively independently of Federal project operations. Such action requires application to the FERC for license under the provisions of the Federal Power Act. The potential effect of such proposals on Federal project operations is considered incidental to processing of license applications. Non-Federal interests may, however, be furnished readily available information concerning such possibilities to facilitate their preparation of applications for licenses.

16-7. Provision for Future Power. Under continuing Congressional authorities, penstocks and other facilities adapted to possible future use in the development of power may be installed in any dam when approved by the Secretary of the Army on the recommendation of the Chief of Engineers and FERC. The decision to recommend provisions for future power requires consideration of the additional cost involved, the probability of future installation and other factors concerning the potential and feasibility of the power development and marketability of its output. The investigation should indicate the minimum provisions, if any, required to avoid precluding future development. If the minimum provision is a block-out at a dam to accommodate future hydropower installation, then it is good engineering practice to incorporate a block-out in the design and construction of the authorized project in coordination with FERC. Field level coordination is undertaken with FERC concerning economic feasibility and with the appropriate Department of Energy marketing agency for hydropower provision other than a block-out. The actual costs for this type of provisions plus interest (compounded, at the initial Corps project construction rate) shall, if power is ultimately developed, be included in the investment costs allocated to that function and subject to repayment (see paragraphs 16-3a and b). If the power is developed under FERC license (see paragraph 16-9), an equivalent amount will be assessed to the licensee as a precondition. This is separate from the charge assessed by FERC for use of the Federal dam as required by the Federal Power Act.

16-8. Control of Releases from Power Plants.

a. Effects of Releases. Reservoir releases to provide peak power service may result in a substantial change in the regimen of a stream. In some cases, the change from relatively steady rates of flow to frequent fluctuation may cause undesirable effects. Fluctuation may reduce the benefits from other reservoir functions, such as recreation, pollution abatement, and water supply.

b. Mitigation. Positive means to prevent or reduce adverse effects are considered in planning and project operation phases. Tangible and intangible benefits may be obtained with measures such as: modification in power output; location of a re-regulating reservoir downstream; or acquisition of additional interest in lands.

c. Minimum Releases. Determination of the project power capabilities will involve consideration of rates and volume of minimum

releases required for downstream purposes. Consideration of downstream effects will also include requirements for limiting the range and rate of stage and discharge fluctuations. Continued attention is given to the effects of releases downstream and to possibilities for modifications in project operations which will have beneficial results.

16-9. Non-Federal Development at Corps Projects. Non-Federal hydroelectric power developments may be constructed at Corps projects through FERC licensing procedures (paragraph 24-12). As a general policy, development of suitable non-Federal hydropower at Corps projects is encouraged. In evaluating proposals for such non-Federal development, total power potential of a site must be considered. This potential can be developed in stages as the local and regional demand for electric power dictates. However, the first stage design and construction should include provisions for future expansion of power facilities compatible with the total power potential of the site and other project uses. The Corps in reviewing an application for permit will not object to issuance of a preliminary permit by FERC for a feasibility study of hydropower development at Corps projects. FERC is informed of any planned or concurrent Corps hydropower study covering the same site as the applicant's study, but the status of Corps studies should not be an impediment to non-Federal hydropower development at Corps sites:

a. Potential New Project (No Existing Dam). Where potential apparently exists, possible development of hydroelectric power should be evaluated in Corps reconnaissance phase studies of new project proposals. Such studies are entirely at Federal expense; if the evaluation effort supports a conclusion that hydropower development could be justifiable, the reconnaissance studies will have the further goal of identifying a non-Federal sponsor willing to costs share, 50-50, project feasibility studies including hydropower. Upon completion of feasibility studies in which hydropower development is considered and found feasible, the resulting preauthorization report will not recommend Federal development of the power unless it would be impractical for non-Federal interests to develop it. Any recommendation for Federal development will be founded on recognition that priority for such development is afforded only to developments for which a non-Federal sponsor willing to fund the investment costs during the period of construction (with later repayment out of power revenues) is available.

b. Addition of Hydropower at Existing Dams. Where Federal development of hydropower is specifically authorized as an element of a Corps project, FERC will not issue a license. Arrangements for construction, including non-Federal financing, are reserved to the Corps. In the absence of any specific hydropower provisions in the project authorization, FERC licensing procedures have proven to be the choice of non-Federal sponsors. (Such licensing is consistent with Corps policy subject to provisions expressed in ER 1130-2-510.)

c. Special Studies. Special studies, such as those undertaken pursuant to Section 216 of the 1970 Flood Control Act, that identify hydropower potential from the reformulation of an existing project, should also identify a non-Federal sponsor for development of that potential. Studies will be programmed and cost shared in the same way as studies responsive to Congressional directives (changes in existing authorized project purposes, so as to include hydropower, require

Congressional authorization).

16-10. Corps Developments at Non-Corps Sites. The Corps has no general legislative authority to construct hydroelectric facilities at non-Federal dams. However, under specific congressional authorities, the Corps has constructed multiple purpose projects which have included hydropower development at other (non-Corps) Federal agency sites. The New Melones project on the Stanislaus River in California is an example of such an instance. The project was constructed by the Corps for the Bureau of Reclamation. Marketing of power from this project is accomplished, as from Corps developments at Corps projects, by the Department of Energy--in this case through the Western Area Power Administration.