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Engineer Manual
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Engineering and Design
HYDROPOWER

1. Purpose. This manual provides guidance on estimating the energy potential of a hydropower site, selecting a project's installed capacity, determining the need for the project's output, evaluating hydropower benefits, and estimating powerhouse costs.

2. Applicability. This EM applies to all HQ, USACE/OCE elements and all field operating activities having civil works design responsibilities.

3. General. This manual describes evaluation techniques for both large and small hydro projects, as well as pumped-storage hydro. These procedures can be applied to the modification or rehabilitation of existing hydro projects as well as to new projects. Information is presented on power system operation and the role of hydropower, the development of data for making hydropower studies, the flow-duration and sequential routing techniques of estimating energy potential, the considerations involved in sizing of powerplants, computer models available for making power studies, the use of reservoir storage for hydropower, special problems involved in estimating costs for hydro projects, techniques for establishing need for hydro projects, alternative approaches for evaluating hydropower benefits, and the methodology for computing power values. Techniques are presented for evaluating multi-project systems as well as single projects, and for incorporating power production in multiple purpose project or system operation. Appendixes include example calculations, a glossary, a list of references, and a table of conversion factors. An outline of the steps in a hydropower study is provided together with an appendix summarizing the technical material to be presented in a hydropower study report. Information on coordination required with the regional Federal Power Marketing Administrations and the Federal Energy Regulatory Commission is also presented.

FOR THE COMMANDER:

ARTHUR E. WILLIAMS
Colonel, Corps of Engineers
Chief of Staff