APPENDIX A

POWER STUDY CHECKLIST

A-1. Introduction. To permit ready review of the power portion of a feasibility study and to ensure proper documentation, enough information must be presented to allow the report to stand on its own. The feasibility report itself normally includes only a brief summary of data and procedures, so the details of the power studies would be presented in a technical appendix.

A-2. Checklist. Following is an outline of the material that should be included in such an appendix. The degree of detail included in each report depends on the type and size of the project. Large or controversial projects may require a more detailed presentation than smaller projects. Those subjects noted with asterisks (*) are items that apply only to certain types of projects or analyses. In the case of "Need For Power," alternative data requirements are presented for both large and small plants (see Section 3-3a). Certain types of projects or studies may require additional data not listed below. For example, pumped-storage studies should present supporting data on selection of the operating cycle and on cost and availability of pumping energy.

1. Project Description
   a. General description of the proposed project
   b. Description of how it fits in existing water control system *
   c. History of power development at the project *

2. Need for Power (for "small" project)
   a. Statement from regional PMA or other sponsoring entities indicating that power is needed

2.1 Need for Power (for "large" project)
   a. Brief description of local economy
   b. Historical power demand
   c. Load forecast
      (1) source of forecast
      (2) forecast methodology
      (3) forecast assumptions
      (4) discussion of forecast uncertainty and alternative scenarios considered
      (5) load forecast by year

(6) reserve requirements
(7) additional power requirements (if any)

d. Resource forecast
(1) description of with-project and without-project conditions
(2) resource projections
(3) discussion of resource uncertainty

e. Load-resource analysis
(1) tabular or graphical comparisons of loads and resources
(2) identification of dates when project output may be needed
(3) impact of alternative load and resource assumptions on need for and timing of project.

3. Hydrology
a. Source of streamflow data, type of data (interval), and length of record
b. Analysis of streamflow record for adequacy
c. Adjustments to streamflow data to modify record
(1) to extend record
(2) to adjust record for upstream regulation, diversions, etc.
(3) to adjust gage data to reflect drainage area at damsite
(4) other adjustments
d. Project operating criteria
(1) description of proposed project operation
(2) downstream channel capacity constraints
(3) list of operating constraints
e. Project characteristics
(1) tailwater curve or tailwater assumptions
(2) storage-elevation curve *
(3) downstream flow requirements
(4) range of expected heads and streamflows
f. Flow unavailable for generation
(1) reservoir diversions *
(2) project water requirements *
(3) leakage and losses
g. Duration curve
(1) flow-duration curves (annual and monthly) *
(2) head-duration curves *

4. Energy Analysis
a. Type of analysis (duration curve vs. sequential routing method)
b. Identification of model used (and brief description if not a standard Corps model).
c. Summary of procedure followed in computing energy output

d. Input assumptions (in addition to those described under hydrology)
   (1) alternative power installations studied (refer also to 5d)
   (2) turbine characteristics
   (3) hydraulic capacity
   (4) efficiency
   (5) head loss
   (6) channel routing assumptions
   (7) generation requirements *

e. Power operation criteria including basis for selection of criteria (where alternative criteria were tested, describe each).
   (1) maximize firm energy vs. maximize average energy vs. maximize dependable capacity, etc.
   (2) base load vs. peaking
   (3) other alternative operations

f. Output (for duration curve analysis)
   (1) total energy potential for the site
   (2) average annual energy
   (3) annual generation-duration curve
   (4) generation-duration curve for peak demand months
   (5) monthly distribution of generation
   (6) monthly generation-duration curves (optional) *

f.1 Output (for sequential routing analysis)
   (1) identification of critical period, including basis for selection *
   (2) total energy potential (for the site)
   (3) average annual energy (for each plant size)
   (4) firm annual energy *
   (5) monthly distribution of generation (firm * and average)
   (6) month by month generation for period of record
   (7) impact on operation of other projects (system benefits, encroachment on adjacent projects, etc.) *

g. Transmission losses

5. Capacity Analysis
   a. Marketability (types of power needed in system)
   b. Physical constraints
   c. Environmental and operating constraints
   d. Selection of range of alternatives considered
      (1) alternative operating modes *
      (2) range of alternative plant sizes
      (3) alternative methods considered for firming up peaking capacity *
      (4) reregulating dam *
      (5) other variables considered *

e. Dependable capacity
   (1) method used and basis for selecting method
   (2) dependable capacity for each alternative
f. Transmission losses *

6. Powerplant Features
   a. General description
   b. Alternative powerhouse sites considered *
   c. Turbines
   d. Generators
   e. Governors
   f. Auxiliary equipment
   g. Connection to load
   h. Control equipment

7. Project Costs and Schedule
   a. Summary of construction cost estimate by feature
   b. Construction schedule
   c. Interest during construction
   d. Investment cost
   e. Transmission costs, including basis for costs
   f. Annual costs
      (1) project interest rate
      (2) project life, including basis for assumed life
      (3) interest and amortization
      (4) operating and maintenance costs, including basis for costs
      (5) interim replacement costs, including basis for costs
      (6) pumping energy costs, including basis for costs (for pumped-storage projects only) *

8. Power Benefits
   a. Method for computing benefits
   b. Description of with-project and without-project system
   c. Power values and required supporting data
   d. Adjustments made to power values and basis for adjustment *
   e. Calculation of benefits

9. Marketability Statement (statement from regional PMA that power is marketable and that costs can be repaid with interest in 50 years).