

CECW-EH-D Engineer Regulation 1110-2-50	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	ER 1110-2-50 22 August 1975
	Engineering and Design LOW LEVEL DISCHARGE FACILTIES FOR DRAWDOWN OF IMPOUNDMENTS	
	Distribution Restriction Statement Approved for public release; distribution is unlimited.	

DAEN-CWE

Regulation
No. 1110-2-50

22 August 1975

Engineering and Design
LOW LEVEL DISCHARGE FACILITIES FOR DRAWDOWN
OF IMPOUNDMENTS

1. Purpose. This regulation states the policy, objectives, and procedures in regard to facilities for drawdown of lakes to be impounded by Civil Works projects.
2. Applicability. This regulation is applicable to all field operating agencies having responsibility for design of Civil Works projects.
3. Policy. It is the policy of the Chief of Engineers that all future lakes impounded by Civil Works projects be provided with low level discharge facilities to meet the criteria for drawdown set forth in this ER. Low level discharge facilities, capable of essentially emptying the lake, provide flexibility in future project operation for unanticipated needs such as major repair of the structure, environmental controls or changes in reservoir regulation. The criteria set forth in this ER will govern in the majority of impoundment projects. However, it may be impracticable to provide the drawdown capability to meet the criteria for certain projects because of their size (unusually small or large) or because of their unique function. Such projects may be exempt from the criteria upon presentation of information in accordance with paragraph 5, below.
4. Design Criteria. As a minimum, low level discharge facilities will be sized to reduce the pool, within a period of four months, to the higher of the following pool levels: (a) a pool level that is within 20 feet of the pre-project "full channel" elevation, or (b) a pool level which will result in an amount of storage in the reservoir that is 10 percent of that at the beginning pool level. The beginning pool level for drawdown will be assigned at spillway crest for uncontrolled spillways and at top of spillway gates for controlled spillways. Inflow into the lake during the drawdown period will be developed by obtaining the average flow for each month of the year. The drawdown period inflow will then be assumed equivalent to the average flow of the highest consecutive four-month period.

This regulation supersedes ER 1110-2-50, 8 May 75

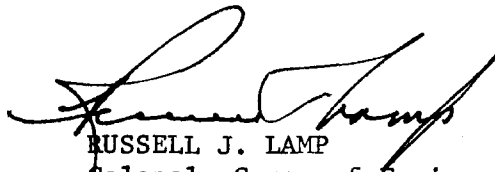
5. Design Study and Reporting Requirements. Feasibility (survey) reports and subsequent pertinent design memoranda should include the results of studies made to determine facilities required for drawdown of impoundments. The discharge capacity required to satisfy project purposes and diversion requirements during construction may be sufficient to meet the drawdown criteria set forth in paragraph 4, above. Where additional capacity is required, studies will be made to determine the most practical and economical means of increasing the capacity to meet the drawdown criteria. A synopsis of the alternatives considered and details of the recommended plan should be included in the Phase II General Design Memorandum or a feature design memorandum. The reporting should include the effects of the required discharge capacity on project costs, on existing downstream projects, and on the potential for downstream damage. When, due to specific project conditions, a drawdown capacity is recommended which does not meet the criteria set forth in paragraph 4, above, the following information should be presented:

a. The drawdown period using the maximum drawdown capability of the proposed project facilities, under the situation described in paragraph 4, above. Information should be included on the pool elevation and corresponding storage volume at end of the period.

b. Information on facilities that would be required to meet the design criteria for drawdown, including the estimated first cost and annual cost of these facilities. If the estimated cost for such facilities is significantly greater than for the proposed project facilities, similar information on intermediate facilities should be provided.

Reporting subsequent to the Phase I General Design Memorandum should include related discharge rating curves; hydrographs with inflow, outflow and pool stage plots; lake regulation plans needed for project purposes and needed to satisfy the drawdown criteria; and other data essential in evaluating the study.

FOR THE CHIEF OF ENGINEERS:


RUSSELL J. LAMP
Colonel, Corps of Engineers
Executive