

CECW-ED

Technical Letter
No. 1110-2-533

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Engineering and Design
LIFELINE REPORT NO. 1, SYSTEMS AT RISK FROM EARTHQUAKES,
HYDROELECTRIC POWER PLANT FACILITIES

1. Purpose

This engineer technical letter (ETL) provides information on the vulnerability of electrical power-generating equipment and power plant facilities equipment to earthquake ground motions.

2. Applicability

This ETL applies to all HQUSACE elements, major subordinate commands, districts, laboratories, and field operating activities having civil works responsibility.

3. References

- a.* Executive Order 12699.
- b.* Public Law 101-614, National Earthquake Hazards Reduction Program (NEHRP) Reauthorization Act.
- c.* Earthquake Hazard Reduction Act of 1977.
- d.* ER 1110-2-1806, Earthquake Design and Analysis for Corps of Engineers Projects.
- e.* ETL 1110-2-301, Interim Procedure for Specifying Earthquake Motions.
- f.* ETL 1110-2-303, Earthquake Analysis and Design of Concrete Gravity Dams.
- g.* ETL 1110-2-339, Seismic Design and Evaluation of Intake Towers.

h. CEGS-13080, Seismic Protection for Mechanical Electrical Equipment.

i. ANSI A17.1, National Elevator Code, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

j. ANSI A58, Minimum Design Loads for Buildings and Other Structures, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

k. NFPA 13, Standards for the Installation of Sprinkler Systems, National Fire Protection Association, P.O. Box 9146, Quincy, MA 02269.

l. Uniform Building Code, International Conference of Building Officials, 5360 South Workman Mill Road, Whittier, CA.

4. Background

a. Lifelines. Corps of Engineers lifelines are those systems and components of Corps projects that are critical to onsite emergency response and to the conveyance of water, power, and other essential commodities to communities in times of a natural disaster. An earthquake is the most likely disaster that would lead to lifeline disruption.

b. Past practices. Past practices for the design of mechanical and electrical equipment at Corps projects, in most instances, did not consider how this equipment should be anchored and configured to protect it from the damaging effects of earthquake ground motions.

c. General objectives. Objectives are to identify the most critical lifelines in terms of vulnerability and impact on project performance, and to provide seismic protection for the most critical lifelines in the most cost effective manner.

5. Action

a. Immediate action. New contracts involving work for hydroelectric power plant facilities should include appropriate provisions for the seismic protection of mechanical and electrical equipment. Military guide specification CEGS-13080 can be used for that purpose.

b. Long-term actions. Walk-through inspections should be conducted on all Corps projects in

FOR THE DIRECTOR OF CIVIL WORKS:

2 Appendices

APP A - Lifeline Report No. 1

APP B - Guidelines for Evaluating the Seismic Vulnerability of Lifelines and Ancillary Systems Required for the Operations of Dams and Mitigation Measures for Reducing Seismic Vulnerability

seismic zones 2A, 2B, 3, and 4 (see Table A-1, Appendix A) in conjunction with periodic inspections. These walk-through inspections should concentrate on vulnerable areas cited in Appendix B. The following items, because of their importance to onsite emergency response, should be properly secured or anchored:

- (1) Batteries required for emergency power, monitoring, and control.
- (2) Emergency engine generators.
- (3) Essential communications equipment.



PAUL D. BARBER, P.E.
Chief, Engineering Division
Directorate of Civil Works