

APPENDIX E

PROGRESSIVE SEISMIC ANALYSIS REQUIREMENTS FOR CONCRETE AND STEEL HYDRAULIC STRUCTURES

Table E-1 shows the progression of seismic analyses required for each phase of project design. Additional guidance concerning these methods of analysis is provided in paragraphs 8e and 8g, and in the references in Appendix A. The types of project seismic studies are described in paragraphs 5h and 10.

Table E-1
Seismic Analysis Progression

Zone	Project Stage				
	Reconnaissance		Feasibility		DM ¹
0 and 1	E	→	SCM	→	RS ²
2A and 2B	E	→	SCM	→	RS
	SCM ²	→	RS ²	→	TH ³
3 and 4	SCM	→	RS	→	TH
	SCM	→	RS	→	RS ⁴
	RS ²	→	TH ³	→	TH ³

Note:

E = Experience of the structural design engineer.

SCM = Seismic coefficient method of analysis.

RS = Response spectrum analysis.

TH = Time-history analysis.

¹ If the project proceeds directly from feasibility to plans and specifications stage, a seismic design memorandum will be required for all projects in zones 3 and 4, and projects for which a TH analysis is required.

² Seismic loading condition controls design of an unprecedented structure, or unusual configuration or adverse foundation conditions.

³ Seismic loading controls the design requiring linear or nonlinear time-history analysis.

⁴ RS may be used in seismic zones 3 and 4 for the feasibility and design memorandum phases of project development only if it can be demonstrated that phenomena sensitive to frequency content (such as soil-structure interaction and structure-reservoir interaction) can be adequately modeled in an RS.