RAS 5591 72-22-ISFSI-State Exhibit 132-Rec'd 6/27/02

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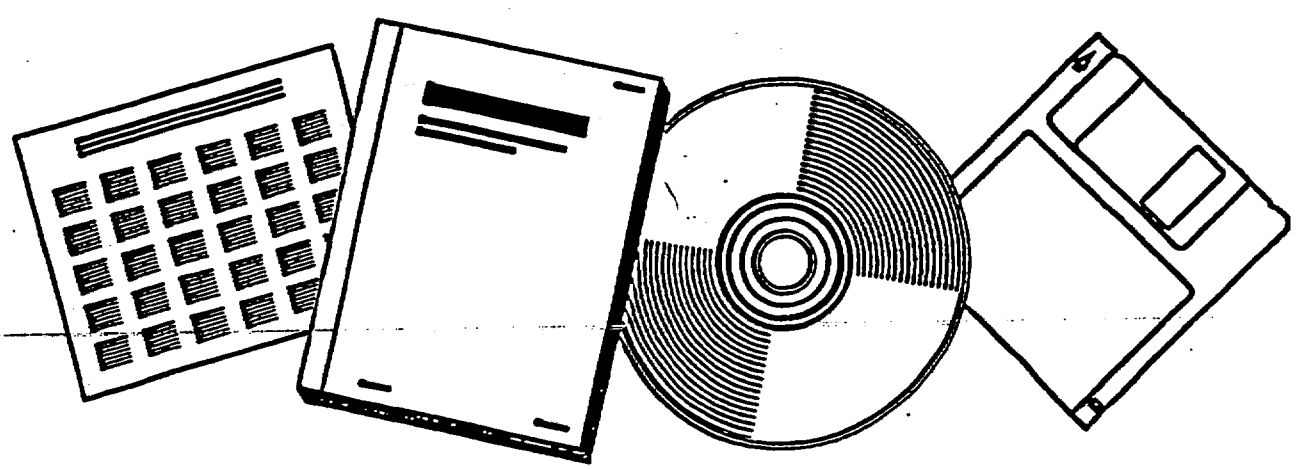
NATURAL PHENOMENA HAZARDS DESIGN AND EVALUATION CRITERIA FOR DEPARTMENT OF ENERGY FACILITIES

DEPARTMENT OF ENERGY
WASHINGTON, DC

JAN 1996



U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

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State's
Exhibit 132
SECY-02

NUCLEAR REGULATORY COMMISSION

Docket No. 72-22 Official Exh. No. State's 132

In the matter of PFS

Staff _____ IDENTIFIED ✓

Applicant _____ RECEIVED ✓

Intervenor ✓ REJECTED _____

Governmental Entity _____

Contractor _____ DATE 6-27-02

Other _____ Witness Bartlett

Reporter R. Davis

factor of 1.5SF times the DBE. Equation 2-7 is useful for developing alternative evaluation and acceptance criteria which are also based on the target performance goals such as inelastic seismic response analyses. To evaluate items for which specific acceptance criteria are not yet developed, such as overturning or sliding of foundations, or some systems and components; this basic intention must be met. If a nonlinear inelastic response analysis which explicitly incorporates the hysteretic energy dissipation is performed, damping values that are no higher than Response Level 2 should be used to avoid the double counting of this hysteretic energy dissipation which would result from the use of Response Level 3 damping values.

2.5 Summary of Seismic Provisions

Table 2-5 summarizes recommended earthquake design and evaluation provisions for Performance Categories 1 through 4. Specific provisions are described in detail in Section 2.3. The basis for these provisions is described in Reference 2-1.

Table 2-5 Summary of Earthquake Evaluation Provisions

	Performance Category (PC)			
	1	2	3	4
Hazard Exceedance Probability, P_H	$2x10^{-3}$	$1x10^{-3}$	$5x10^{-4}$ ($1x10^{-3}$)[1]	$1x10^{-4}$ ($2x10^{-4}$)[1]
Response Spectra	Median amplification (no conservative bias)			
Damping for Structural Evaluation	5%		Table 2-3	
Acceptable Analysis Approaches for Structures	Static or dynamic force method normalized to code level base shear		Dynamic analysis	
Analysis approaches for systems and components	UBC Force equation for equipment and non-structural elements (or more rigorous approach)		Dynamic analysis using in-structure response spectra (Damping from Table 2-3)	
Importance Factor	I=1.0	I=1.25	Not used	
Load Factors	Code specified load factors appropriate for structural material		Load factors of unity	
Scale Factors	Not Used		SF = 1.0	SF = 1.25
Inelastic Energy Absorption Ratios	Accounted for by R_w from Table 2-2		$F\mu$ from Table 2-4 by which elastic response is reduced to account for permissible inelastic behavior	
Material Strength	Minimum specified or 95% non-exceedance in-situ values			
Structural Capacity	Code ultimate strength or allowable behavior level		Code ultimate strength or limit-state level	
Quality Assurance Program	Required within a graded approach (i.e., with increasing rigor ranging from UBC requirements from PC-1 to nuclear power plant requirements for PC-4)			
Peer Review	Not Required	Required within a graded approach (i.e., with increasing rigor ranging from UBC requirements from PC-2 to nuclear power plant requirements for PC-4)		

[1]For sites such as LLNL, SNL-Livermore, SLAC, LBL, & ETEC which are near tectonic plate boundaries