

memorandum

DATE: August 22, 2001

REPLY TO

ATTN OF: Office of Nuclear and Facility Safety Policy:HChander:301-903-6681

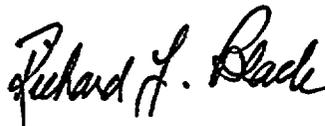
SUBJECT: REVISED DOE STANDARD 1020-2001, NATURAL PHENOMENA HAZARDS DESIGN AND EVALUATION CRITERIA FOR DEPARTMENT OF ENERGY FACILITIES, PROJECT NUMBER NPHZ - 0001

TO: Technical Standards Program Managers

The subject technical standard has been revised to conform to latest industry codes/standards and is released for your review and comment. The technical standard can be found at the Technical Standards Program Web Site at <http://tis.eh.doe.gov/techstds/>. After comments have been resolved, the document will be approved as a DOE standard and listed in the DOE standards Index, DOE-TSL-1.

Please review the document and provide your comments to the preparer, Dr. Harish Chander, EH-53, by the comment due date (45 day coordination period) listed for this project at the above Web Site. Your comments must be designated as either essential or suggested and proposed resolutions to those comments provided. Essential comments are those which, if not addressed, would make the document technically unacceptable to your organization and must be supported by detailed rationale. All comments must be in the form of word-for-word changes to the draft document.

Responses from DOE Area Offices, Laboratories, and M&O Contractors should be returned through the appropriate DOE management or organization channels in sufficient time to permit consolidation by the Operations Office and subsequent transmittal to the preparer before the due date. Comments received after that date will be held for the next revision, unless it is possible to address them without affecting the timely approval of the document. Please contact Dr. Chander if you have any questions on this DOE Technical Standards project. Dr. Chander can be reached at 301-903-6681. Please e-mail questions to Dr. Chander at harish.chander@eh.doe.gov.



Richard L. Black, Director
Office of Nuclear and
Facility Safety Policy

DOCKETED
USNRC

2003 JAN 29 PM 3:17

OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

NUCLEAR REGULATORY COMMISSION

Docket No. _____ Official Ex. No. 126

In the matter of PFS

Staff _____ IDENTIFIED

Applicant _____ RECEIVED

Intervenor _____ REJECTED _____

Other _____ WITHDRAWN _____

DATE 5-17-02 Witness _____

Clerk D. Kent

Template = SECY-028

State's
Exhibit 126

UT-47027

SECY-02

Table C-3 Seismic Performance Goals & Specified Seismic Hazard Probabilities

Performance Category	Target Seismic Performance Goal, P_F	Seismic Hazard Exceedance Probability, P_H	Risk Reduction Ratio, R_R
1	$1 \times 10^{-3}^{**}$	$4 \times 10^{-4}^{**}$	
2	$5 \times 10^{-4}^{**}$	$4 \times 10^{-4}^{**}$	
3	1×10^{-4}	$4 \times 10^{-4}^{**}$ (1×10^{-3}) ¹	4 (10) ¹
4	1×10^{-5}	1×10^{-4} (2×10^{-4}) ¹	10 (20) ¹

* The seismic exceedance probability is based on USGS maps generated in 1997 (and included in IBC 2000) for 2% exceedance probability in 50 years.

** The design methodology of IBC 2000 for Seismic Use Groups I and III achieves approximately performance goals of PC-1 & PC-2 respectively though it does not meet the relationship shown in equation C-1 for the seismic provisions.

¹ For sites such as LLNL, SNL-Livermore, SLAC, LBL, and ETEC which are near tectonic plate boundaries.

Different structures, systems, or components may have different specified performance goal probabilities, P_F . It is required that for each structure, system, or component, either: (1) the performance goal category; or (2) the hazard probability (P_H) or the DBE together with the appropriate R_R factor will be specified in a design specification or implementation document that invokes these criteria. As shown in Table C-3, the recommended hazard exceedance probabilities and performance goal exceedance probabilities are different. These differences indicate that conservatism must be introduced in the seismic behavior evaluation approach to achieve the required risk reduction ratio, R_R . In earthquake evaluation, there are many places where conservatism can be introduced, including:

1. Maximum design/evaluation ground acceleration and velocity.
2. Response spectra amplification.
3. Damping.
4. Analysis methods.
5. Specification of material strengths.
6. Estimation of structural capacity.
7. Load or scale factors.
8. Importance factors/multipliers.
9. Limits on inelastic behavior.
10. Soil-structure interaction (except for frequency shifting due to SSI).
11. Effective peak ground motion.
12. Effects of a large foundation or foundation embedment.

For the earthquake evaluation criteria in this standard, conservatism is intentionally introduced and controlled by specifying (1) hazard exceedance probabilities, (2) load or scale