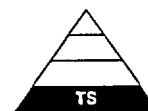


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DATE 060502 Witness Arabas  
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NOT MEASUREMENT  
SENSITIVE

DOE-STD-1020-2002  
January 2002

Superseding  
DOE-STD-1020-94  
April 1994

## DOE STANDARD

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



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Code and for all intent and purposes the exact numerical values have no practical significance. The numerical values for PC 1 and PC 2 are no longer exact for the seismic provisions of the IBC 2000 which primarily intends to provide uniform margin of collapse for PC 1 SSCs throughout the United States.

The required degree of conservatism in the deterministic acceptance criteria is a function of the specified risk reduction ratio. Table C-3 provides a set of seismic hazard exceedance probabilities,  $P_H$  and risk reduction ratios,  $R_R$  for Performance Categories 1 through 4 required to achieve the seismic performance goals specified in Table C-1. Note that Table C-3 follows the philosophy of:

- 1) Annual seismic hazard exceedance of  $4 \times 10^{-4}$  (generally) based on IBC2000 for PC-1 and PC-2, and PC-3 but  $1 \times 10^{-4}$  for PC-4.
- 2) gradual reduction in hazard annual exceedance probability of other natural phenomena hazards.
- 3) gradual increase in conservatism of evaluation procedure as one goes from Performance Category 1 to Performance Category 4 (PC 1 to PC 4).

**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	**	*	
2	**	*	
3	$1 \times 10^{-4}$	$4 \times 10^{-4}$ * ( $1 \times 10^{-3}$ ) <sup>1</sup>	4 (10) <sup>1</sup>
4	$1 \times 10^{-5}$	$1 \times 10^{-4}$ ( $2 \times 10^{-4}$ ) <sup>1</sup>	10 (20) <sup>1</sup>

- \* The seismic exceedance probability is based on USGS maps generated in 1997 (and included in IBC 2000) for 2% exceedance probability in 50 years.  $P_H = 4 \times 10^{-4}$  (Generally). Supplement by deterministic ground motions near very active faults.
- \*\* The design methodology of the 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.
- <sup>1</sup> For sites such as LLNL, SNL-Livermore, SLAC, LBNL, and ETEC which are near tectonic plate boundaries.