BNFL Inc.

Document title: **Applicability of DOE Documents to the Design of TWRS-P Facility for Natural Phenomena Hazards**

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History sheet

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1. Introduction

The TWRS-P Facility processes and stores radioactive and hazardous materials. Consequently, it is necessary to ensure that the Facility can provide an adequate level of safety to workers and the public. One of the steps in achieving this objective is to design the Facility to withstand the effects of natural phenomena hazards (NPH) such as earthquakes. To that end, DOE-STD-1020-94 has been selected for the design of the TWRS-P Facility for NPH. However, as noted in its introduction, DOE-STD-1020-94 is a part of a set of documents that specify the NPH requirements. There is an established hierarchy in this set of documents. In this hierarchy, DOE Order 420.1 is the highest authority. The next set of controlling documents are the associated Implementation Guides followed by the set of NPH standards. Thus, these documents need to be reviewed to determine their applicability to the design of the TWRS-P Facility for NPH.

2. Objective

The objective of this report is to document the applicability review and tailoring of the provisions of the following DOE documents that specify NPH requirements.

• DOE Order 420.1 including Change 2 dated 10/24/96 (Section 4.4 only)	Facility Safety
• DOE Implementation Guide IG-420.1.4 dated 10/26/95 (Draft)	Interim Guidelines for the Mitigation of Natural Phenomena Hazards for DOE Nuclear Facilities and Non-Nuclear Facilities
• DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes)	Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
• DOE-STD-1021-93 including Change Notice #1 dated 1/96	Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems and Components
• DOE-STD-1022-94 including Change Notice #1 dated 1/96	Natural Phenomena Hazards Characterization Criteria
• DOE-STD-1023-95 including Change Notice #1 dated 1/96	Natural Phenomena Hazards Assessment Criteria
• DOE-STD-1024-92 including Change Notice #1 dated 1/96	Guidelines for Use of Probabilistic Seismic Hazard Curves at Department of Energy Sites for Department of Energy Facilities

DOE Order 420.1 establishes facility safety requirements related to nuclear safety design, criticality safety, fire protection and NPH mitigation. Section 4.4 of the Order discusses NPH mitigation requirements. DOE Implementation Guide IG-420.1.4 provides guidance for implementing these requirements. DOE Standards DOE-STD-1020 through 1024 contain specific acceptance criteria for various aspects of NPH to meet the requirements of DOE O 420.1 and IG-420.1.4.

3. Scope

The scope of the Report includes the following:

(a) Review provisions of the DOE documents listed in Section 2.0

(b) Determination of the applicability of these provisions to the design of TWRS-P Facility

(c) Providing explanation for inapplicability of the provisions

The DOE documents listed in Section 2.0 refer to other documents. Review of these referenced documents is addressed in one of the following ways:

Case 1: The referenced document is invoked in the text of the DOE document

The pertinent provisions of the referenced document are reviewed for applicability to the design of TWRS-P Facility for NPH. For example, in Section 2.3.1 of DOE-STD-1020-94, UBC is referenced. This report discusses applicability of the seismic design provisions of UBC to the design of TWRS-P Facility.

Case 2: The referenced document is not invoked in the text of the DOE document

The referenced document is not reviewed, nor it is implied that the document is applicable to the design of TWRS-P Facility.

4. Abbreviations

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
DBE	Design Basis Earthquake
DOE	Department of Energy
NPH	Natural Phenomena Hazard
NRC	Nuclear Regulatory Commission
PC	Performance Category
R.G.	Regulatory Guide
SRD	Safety Requirement Document
SSC	Structure, System and Component
TWRS-P	Tank Waste Remediation System Privatization

5. Review

The review is shown in a tabular form on the following pages. In some instances, the provisions of the DOE document, though applicable, have been modified for the design of TWRS-P Facility, as explained in the “Remarks” column. The reason for the modifications is either to use the latest revision of the industry code/standard or to meet NRC requirements.

DOE O 420.1 including Change 2 dated 10/24/96
Facility Safety

Section	Description	Applicability to TWRS-P Facility Design	Remarks
4.4	**Natural Phenomena Hazards Mitigation**		
4.4.1	General Requirements	Yes	
4.4.2	Natural Phenomena Mitigation Design Requirements	Yes	
4.4.3	Evaluation and Upgrade of Existing DOE Facilities	No	The TWRS-P Facility is new.
4.4.4	Natural Phenomena Hazards Assessment	Yes	
4.4.5	Natural Phenomena Detection	No	It is presumed that DOE will continue to maintain and operate the current instrumentation in the 200 East Area for detection and recording of the occurrence and severity of seismic events. Therefore, no new instrumentation is considered necessary.
4.4.6	Post-Natural Phenomena Procedures	Yes	

DOE IG-420.1.4 dated 10/26/95 (Draft)
Interim Guidelines for the Mitigation of Natural Phenomena Hazards for DOE Nuclear Facilities and Non-Nuclear Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
I	**Introduction**	Yes	
II	**Application**	Yes	
III	**General Information**	Yes	
IV	**Guidelines**		
	IV.1 Graded Approach	Yes	
	IV.2 NPH Design	Yes	
	IV.3 Evaluation and Upgrade of Existing DOE Facilities	No	The TWRS-P Facility is new.
	IV.4 Natural Phenomena Hazard Assessment	Yes	
	IV.5 Seismic Detection	No	See Remarks against Section 4.4.5 of DOE O 420.1.
	IV.6 Post-Natural Phenomena Procedures	Yes	
V	**Implementation**	Yes	
	V.1 Implementation Steps	Yes	
	V.2 Implementation at New and Existing Facilities	Yes	
App. A	**Bibliography**	Yes	
App. B	**Definitions**	Yes	
App. C	**Natural Phenomena Hazards to be addressed**	Yes	

DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
1.0	**Introduction**		
1.1	Overview of DOE Natural Phenomena Hazards Order, Standards and Guidance	Yes	
1.2	Overview of the NPH Design and Evaluation Criteria	Yes	
1.3	Evaluation of Existing Facilities	No	The TWRS-P Facility is new.
1.4	Quality Assurance and Peer Review	Yes	
2.0	**Earthquake Design and Evaluation Criteria**		
2.1	Introduction	Yes	
2.2	General Approach for Seismic Design and Evaluation	Yes. See Remarks	• 1997 UBC will be used in lieu of 1994 UBC, since it is more current. • PC-3 SSCs will be designed for the elastic seismic response to DBE per Section 3.7.2 of NRC NUREG-0800, Rev. 3 (Draft). This will satisfy both the DOE as well as the NRC requirements. • ASCE 4-98 (Draft) will be used in lieu of ASCE 4-86, since it is more current.
2.3	Seismic Design and Evaluation of Structures, Systems, and Components	Yes. See Remarks	Performance categorization of SSCs will not be based on DOE-STD-1021. See remarks against DOE-STD-1021.
2.3.1	*Performance Category 1 and 2 Structures, Systems, and Components*	Yes. See Remarks	1997 UBC will be used in lieu of 1994 UBC, since it is more current
2.3.2	*Performance Category 3 and 4 Structures, Systems, and Components*	Yes. See Remarks	• Since the SSCs will be designed for the elastic seismic response to DBE, the values of inelastic energy absorption factor and scale factor in equation 2-2 will be assumed equal to 1.0. • ACI 349 and ANSI/AISC N690 will be used for design of reinforced concrete and structural steel respectively, in lieu of UBC, since these are nuclear structures.

DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
2.3.3	*Damping Values for Performance Category 3 and 4 Structures, Systems, and Components*	Yes. See Remarks	The following Response Level 2 damping values will be used in lieu of those shown in Table 2-3: • Piping: per ASME Code Case N-411. • Electrical cabinets and other equipment: 3 per NRC R.G. 1.61, October 1973, for SSE This will satisfy both the DOE as well as NRC requirements.
2.4	Additional Requirements		
2.4.1	*Equipment and Distribution Systems*	Yes. See Remarks	• Seismic design of PC-1 and 2 elements of structures and equipment will be done per the provisions of 1997 UBC in lieu of 1994 UBC since 1997 UBC is more current.
2.4.2	*Evaluation of Existing Facilities*	No	The TWRS-P Facility is new.
2.4.3	*Basic Intention of Dynamic Analysis Based Deterministic Seismic Evaluation and Acceptance Criteria*	Yes	
2.5	Summary of Seismic Provisions	Yes. See Remarks	See remarks against Section 2.3.2. Seismic provisions in Table 2-5 will be used with the following modified provisions concerning PC-3 and 4 SSCs: • Load Factors: Code specified load factors appropriate for structural material • Scale Factor = 1.0 • Inelastic Energy Absorption Factor = 1.0 • Structural Capacity: Code ultimate strength or allowable behavior level
3.0	**Wind Design and Evaluation Criteria**		
3.1	Introduction	Yes. See Remarks	Performance categorization of SSCs will not be based on DOE-STD-1021. See remarks against DOE-STD-1021.
3.2	Wind Design Criteria	Yes. See Remarks	Peak gust speed values contained in Attachment "A" of DOE Interim Advisory dated 1/22/98 will be used in lieu of fastest-mile wind speeds shown in Table 3-2; also, per DOE Interim Advisory, Importance factor for PC-2 SSCs will be 1.0 in lieu of 1.07 indicated in Table 3-1.

DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
3.2.1	*Performance Category 1*	Yes. See Remarks	Structural steel PC-1 SSCs will be designed per AISC Manual of Steel Construction, Allowable Stress Design, Ninth edition; Reinforced concrete PC-1 SSCs will be designed per ACI 318-95.
3.2.2	*Performance Category 2*	Yes. See Remarks	Structural steel PC-2 SSCs will be designed per AISC Manual of Steel Construction, Allowable Stress Design, Ninth edition; Reinforced concrete PC-2 SSCs will be designed per ACI 318-95.
3.2.3	*Performance Category 3*	Yes. See Remarks	• Structural steel PC-3 SSCs will be designed per ANSI/AISC N690-84. Reinforced concrete PC-3 SSCs will be designed per ACI 349-90. • Tornado is not a credible NPH at the TWRS-P Facility site.
3.2.4	*Performance Category 4*	No	There are no PC-4 SSCs at the TWRS-P Facility.
3.2.5	*Design Guidelines*	Yes	
3.3	Evaluation of Existing SSCs	No	The TWRS-P Facility is new.
4.0	**Flood Design and Evaluation Criteria**	Yes. See Remarks	Since river flooding is not a credible NPH at the TWRS-P Facility site, only the criteria dealing with local precipitation that affects roof design and site drainage are applicable to the TWRS-P Facility design.
4.1	Flood Design Overview	Yes	
4.1.1	*Design Basis Flood (DBFL)*	Yes	
4. 1.2	*Flood Evaluation Process*	Yes. See Remarks	Performance categorization of SSCs will not be based on DOE-STD-1021. See remarks against Section 2.3
4.1.3	*Flood Design Strategies*	Yes	
4.2	Flood Design Criteria	Yes	
4.2.1	*Performance Category 1*	Yes	
4.2.2	*Performance Category 2*	Yes	
4.2.3	*Performance Category 3*	Yes	
4.2.4	*Performance Category 4*	No	There are no PC-4 SSCs at the TWRS-P Facility.
4.3	Flood Design Practice for SSCs Below the DBFL Elevation	Yes	
4.3.1	*Flood Loads*	Yes	

DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
4.3.2	*Design Requirements*	Yes	
4.3.3	*Site Drainage and Roof Design*	Yes. See Remarks	1997 UBC will be used in lieu of 1994 UBC, since it is more current.
4.3.4	*Flood Protection and Emergency Operation Plans*	Yes	
4.4	Considerations for Existing Construction	No	The TWRS-P Facility is new.
4.5	Probabilistic Flood Risk Assessment	See Remarks	Since UCRL-21069, "Probabilistic Flood Hazard Assessment for the N Reactor, Hanford, Washington", July 1988, contains probabilistic flood risk assessment of the N reactor site, an assessment of the TWRS-P Facility site is not considered necessary.
App. A	**Terminology and Definitions**	Yes	
App. B	**Commentary on General NPH Design and Evaluation Criteria**		
B.1	NPH Design and Evaluation Philosophy	Yes	
B.2	Graded Approach, Performance Goals, and Performance Categories	Yes. See Remarks	Performance categorization of SSCs will not be based on DOE-STD-1021. See remarks against DOE-STD-1021.
B.3	Evaluation of Existing Facilities	No	The TWRS-P Facility is new.
App. C	**Commentary on Earthquake Design and Evaluation Criteria**		
C.1	Introduction	Yes. See Remarks	Performance categorization of SSCs will not be based on DOE-STD-1021. See remarks against DOE-STD-1021.
C.2	Basic Approach for Earthquake Design and Evaluation and Meeting Target Performance Goals		
C.2.1	*Overall Approach for DOE Seismic Criteria*	Yes	
C.2.2	*Influence of Seismic Scale Factor*	Yes	
C.3	Seismic Design/evaluation Input	Yes	

DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
C.3.1	*Earthquake Hazard Annual Exceedance Probabilities*	Yes	
C.3.2	*Earthquake Ground Motion Response Spectra*	Yes. See Remarks	Section 3.2.1 discussion and Table C-4 are based on 1994 UBC. For TWRS-P Facility design, 1997 UBC will be followed.
C.3.3	*Effective Peak Ground Motion*	Yes	
C.4	Evaluation of Seismic Demand **(**Response)	Yes. See Remarks	1997 UBC will be used in lieu of 1994 UBC, since it is more current.
C.4.1	*Dynamic Seismic Analysis*	Yes. See Remarks	ASCE 4-98 (Draft) will be used in lieu of ASCE 4-86, since it is more current.
C.4.2	*Static Force Method of Seismic Analysis*	Yes	
C.4.3	*Soil-Structure Interaction*	Yes. See Remarks	ASCE 4-98 (Draft) will be used in lieu of ASCE 4-86, since it is more current.
C.4.4	Analytical Treatment of Energy D*issipation and Absorption*	Yes. See Remarks	PC-3 SSCs will be designed for the elastic seismic response to DBE per Section 3.7.2 of NRC NUREG-0800, Rev. 3 (Draft). This will satisfy both the DOE as well as the NRC requirements.
C.5	Capacities		
C.5.1	*Capacity Approach*	Yes. See Remarks	ACI 349 and ANSI/AISC N690 will be used for the design of reinforced concrete and structural steel respectively, since these are nuclear structures.
C.5.2	*Seismic Design and Detailing*	Yes	
C.6	Special Considerations for Systems and Components	Yes	
C.7	Special Considerations for Existing Facilities	No	The TWRS-P Facility is new.
C.8	Quality Assurance and Peer Review	Yes	
C.9	Alternate Seismic Mitigation Measures	No	Seismic base isolation is not planned to be used in the TWRS-P Facility design.
App. D	**Commentary on Wind Design and Evaluation Criteria**		
D.1	Wind Design Criteria	Yes	
D.2	Tornado Hazard Assessment	Yes	

DOE-STD-1020-94 including Change Notice #1 dated 1/96 and Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornadoes) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
D.3	Load Combinations	Yes. See Remarks	• Structural steel PC-1 and PC-2 SSCs will be designed per AISC Manual of Steel Construction, Allowable Stress Design, Ninth edition; Reinforced concrete PC-1 and PC-2 SSCs will be designed per ACI 318-95. • Structural steel PC-3 SSCs will be designed per ANSI/AISC N690-84. Reinforced concrete PC-3 SSCs will be designed per ACI 349-90.
D.4	Windborne Missiles	Yes	
App. E	**Effects of Natural Phenomena Hazards**		
E.1	Effects of Earthquake	Yes	
E.2	Effects of Wind	Yes	
E.3	Effects of Flooding	Yes	

DOE-STD-1021-93 including Change Notice #1 dated 1/96
Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components

Section	Description	Applicability to TWRS-P Facility Design	Remarks
Entire Standard		No	The classification approach employed in this Standard will not be adopted on the TWRS-P Project. The following approach will be used in lieu: Seismic categorization, as described in BNFL letter W338-98-0054 dated 5/1/98, will be assigned to SSCs as a consequence of their safety functions. These safety functions will be determined by the hazard evaluation process given in the SRD, Volume II, Appendix A, "Implementing Standard for Safety Standards and Requirements Identification" and by engineering analyses. • Seismic Category I will be assigned to those SSCs that the hazard evaluation process identifies as important-to-safety and as having seismic safety functions. Seismic Category I items will be designed to meet DOE-STD-1020-94 requirements for PC-3 SSCs. • Seismic Category II will be assigned to those SSCs whose failure during a seismic event could prevent a Seismic Category I SSC from performing its seismic safety function. Seismic Category II SSCs will be identified through engineering analyses and will be designed to meet DOE-STD-1020-94 requirements for PC-3 SSCs. • Seismic Category III will be assigned to those SSCs that the hazard evaluation process identifies as important-to-safety but without seismic safety functions. Seismic Category III will be assigned through engineering analyses to SSCs that are not designated as important-to-safety, but which have some inventory of radioactive or hazardous materials. Seismic Category III items will be designed to meet DOE-STD-1020-94 requirements for PC-2 SSCs. • Seismic Category IV will be assigned through engineering analyses to SSCs that are not designated as important-to-safety and have no significant inventory of radioactive or hazardous material, but which require protection per the UBC. Seismic Category IV items will be designed to meet DOE-STD-1020-94 requirements for PC-1 SSCs.

DOE-STD-1022-94 including Change Notice #1 dated 1/96
Natural Phenomena Hazards Characterization Criteria

Section	Description	Applicability to TWRS-P Facility Design	Remarks
1.0	**Introduction**		
1.1	Overview of DOE-NPH Order and Standards	Yes	
	Purpose	Yes	
	Scope	Yes	
2.0	**Applicable Documents**	See Remarks	• DOE O 5480.1B has since been replaced by DOE O 440.1A dated 3/98, which is applicable to the TWRS-P Facility. • DOE O 5481.1B has since been cancelled. • DOE O 5480.30 is not applicable since it deals with nuclear reactor safety, whereas, the TWRS-P Facility is a non-reactor facility.
3.0	**Definitions**	Yes	
4.0	**General Requirements**	Yes	
5.0	**Detailed Requirements**		
5.1	Site Description	Yes	
5.2	Meteorology		
5.2.1	*Regional Climatology Description and History*	Yes	
5.2.2	*Wind Data Collection*	Yes	
5.2.3	*Precipitation and Snowfall Data*	Yes	
5.3	Hydrology		
5.3.1	*Hydrological Data Collection*	Yes	
5.3.2	*Flood History*	Yes	
5.3.3	*River Flooding*	Yes	
5.3.4	*Dam, Levee, or Dike Failure*	Yes	
5.3.5	*Storm Surge*	No	The TWRS-P Facility site is located within a region that does not experiences hurricanes or strong storm squalls.

DOE-STD-1022-94 including Change Notice #1 dated 1/96
Natural Phenomena Hazards Characterization Criteria

Section	Description	Applicability to TWRS-P Facility Design	Remarks
5.3.6	*Tsunami*	No	The TWRS-P Facility site is located away from ocean.
5.3.7	*Seiche*	No	The TWRS-P Facility site is located away from large bodies of water, such as, a bay, lake or reservoir.
5.3.8	*Wave Action*	No	Wave action due to extreme winds is not considered a hazard at the TWRS-P Facility site, since the river water level is much lower than the site elevation.
5.3.9	*Landslide and Volcano Created Natural Hydrological Consequences*	Yes. See Remarks	The only credible volcanic hazard at the TWRS-P Facility site is tephra (ash).
5.3.10	*Flood Runoff/Drainage*	Yes	
5.3.11	*Ground Water Hydrology*	No	The ground water table at the TWRS-P Facility site is very deep (>200 ft).
5.4	Geology and Seismology	Yes	
5.4.1	*Seismic Sources*	Yes	
5.4.2	*Vibratory Ground Motions*	Yes	
5.4.3	*Earthquake-Induced Flooding*	Yes. See Remarks	See Remarks against Sections 5.3.6 and 5.3.7.
5.4.4	*Other Geologic Hazards*	Yes. See Remarks	• Volcanic hazards: The only credible volcanic hazard at the TWRS-P Facility site is tephra (ash). • Non-tectonic surface deformation: None of the non-tectonic phenomena described in Section 5.4.4.2 are credible hazards at the TWRS-P Facility site.
5.5	Geotechnical Studies	Yes	
5.5.1	*Site Investigations*	Yes	
5.5.2	*Site Response Analysis*	Yes	
5.5.3	*Soil-Structure Interaction Analysis*	Yes	
5.5.4	*Ground Failure Evaluations*	Yes	

DOE-STD-1023-95 including Change Notice #1 dated 1/96
Natural Phenomena Hazards Assessment Criteria

Section	Description	Applicability to TWRS-P Facility Design	Remarks
1.0	**Scope**	Yes	
2.0	**Applicable Documents**	Yes. See Remarks	• DOE O 5480.1B has since been replaced by DOE O 440.1A dated 3/98, which is applicable to the TWRS-P Facility. • DOE O 5481.1B has since been cancelled. • DOE O 5480.30 is not applicable since it deals with nuclear reactor safety, whereas, the TWRS-P Facility is a non-reactor facility.
3.0	**Criteria**	Yes	
3.1	Detailed Criteria for Seismic Hazard Assessment	Yes	
3.1.1	*General*	Yes	
3.1.2	*Development of Site-Specific Seismic Hazard Curves*	Yes	
3.1.3	*Development of DBE Response Spectra*	Yes	
3.1.4	*Earthquake-Induced Ground Failure Assessment*	Yes	
3.1.5	*Historical Earthquake Ground Motion Check*	Yes	
3.2	Detailed Criteria for Wind Hazard Assessment		
3.2.1	*General*	Yes	
3.2.2	*Criteria for Site-Specific Probabilistic Wind Hazard Assessment*	Yes	
3.3	Detailed Criteria for Flood Hazard Assessment		
3.3.1	*General*	Yes	

DOE-STD-1023-95 including Change Notice #1 dated 1/96
Natural Phenomena Hazards Assessment Criteria

Section	Description	Applicability to TWRS-P Facility Design	Remarks
3.3.2	*Flood Screening Analysis*	Yes	
3.3.3	*Comprehensive Flood Hazard Assessment*	Yes	
3.3.4	*Flood Event Combinations*	Yes	
3.3.5	*Historic Flood Check*	Yes	

DOE-STD-1024-92 including Change Notice #1 dated 1/96
Guidelines for Use of Probabilistic Seismic Hazard Curves at Department of Energy Sites for Department of Energy Facilities

Section	Description	Applicability to TWRS-P Facility Design	Remarks
Entire Standard except the Foreword		No	• This Standard specifically applies to DOE sites east of 104W. The TWRS-P Facility site is west of 104W.
Foreword		Yes. See Remarks	• In the foreword to the Standard, it is recommended that all future seismic hazard curves should be developed using the methods provided in DOE-STD-1023-95, since it is a more recent standard than this standard. Seismic hazard curves for the TWRS-P Facility site have been developed using the methods provided in DOE-STD-1023-95.

6. Documents Incorporating DOE NPH Standards Requirements

The following is a list of Project and other documents that incorporate the NPH design requirements specified in the DOE Standards reviewed in Section 5.0 and that will be used for the design of the TWRS-P Facility:

DOE Standard	Section	Description	Document incorporating DOE NPH Standards Requirements
1020	2.0	Seismic Design Criteria	The TWRS-P Facility Seismic Analysis and Design Criteria (in development)
	3.0	Wind Design Criteria	The TWRS-P Facility Structural Design Criteria (in development)
	4.0	Flood Design Criteria	The TWRS-P Facility Structural Design Criteria (in development) and Natural Phenomena Hazards, Hanford Site, South-Central Washington*
1021	Entire Standard	NPH Performance Categorization of SSCs	The Standard is not applicable to the TWRS-P Facility.
1022	5.1	Site Description	The TWRS-P Facility Plot Plan and Topographic Map (in development)
	5.2	Meteorology	Natural Phenomena Hazards, Hanford Site, South-Central Washington*
	5.3	Hydrology	Natural Phenomena Hazards, Hanford Site, South-Central Washington*
	5.4	Geology and Seismology	Probabilistic Seismic Hazard Analysis-DOE Hanford Site, Washington**
	5.5	Geotechnical Studies	The TWRS-P Facility Geotechnical Investigation Report (in development)
1023	3.1	Seismic Hazard Assessment Criteria	Probabilistic Seismic Hazard Analysis-DOE Hanford Site, Washington**
	3.2	Wind Hazard Assessment Criteria	Natural Phenomena Hazards, Hanford Site, South-Central Washington*
	3.3	Flood Hazard Assessment Criteria	Natural Phenomena Hazards, Hanford Site, South-Central Washington*
1024	Entire Standard	Seismic Hazard Curves	The Standard is not applicable to the TWRS-P Facility.

* WHC-SD-GN-ER-501, Rev. 1 by Westinghouse Hanford Company

** WHC-SD-W236 A-TI-002, Rev. 1A by Geomatrix Consultants