Grand Gulf Nuclear Station

Unit 3

Combined

License

Application

Part 7: Departures Report

(Includes Information on Departures, Variances, and Exemptions)

Revision 0

February 2008

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1.0 DEPARTURES

A *departure* is a plant-specific deviation from design information in a standard design certification rule. Departures from the reference ESBWR Design Control Document (DCD) are identified and evaluated consistent with regulatory requirements and guidance. Reference to the ESBWR DCD is understood to mean Tier 2, unless otherwise noted. Each departure is examined in accordance with 10 CFR 52 requirements.

This report includes one departure that requires prior NRC approval. Since this departure involves Tier 1 information (repeated in Tier 2 information), an exemption is requested.

GGNS DEP 2.0-1: Seismic Spectra Exceedance

Departure: GGNS DEP 2.0-1 – Seismic Spectra Exceedance

The Unit 3 horizontal and vertical response spectra are bounded by the ESBWR horizontal and vertical response spectra, except for frequencies below approximately 0.2 Hz. FSAR Figure 2.0-201, “Unit 3 ESBWR Horizontal Design Ground Motion Response Spectra Comparison at Reactor Building Foundation Level,” and FSAR Figure 2.0-202, “Unit 3 ESBWR Vertical Design Ground Motion Response Spectra Comparison at Reactor Building Foundation Level,” provide the site-specific horizontal and vertical Ground Motion Response Spectra (GMRS), which are bounded by the ESBWR horizontal and vertical GMRS, except for frequencies below approximately 0.2 Hz for horizontal spectra and 0.15 Hz for vertical spectra. Therefore, the ESBWR DCD Tier 1, Figure 5.1-1, “ESBWR Horizontal SSE Design Ground Spectra at Foundation Level,” and the ESBWR DCD Tier 2, Figure 2.0-1, “ESBWR Horizontal SSE Design Ground Spectra at Foundation Level,” are replaced by the Unit 3 updated GMRS shown in FSAR Figure 2.0-201. In addition, ESBWR Tier 1, Figure 5.1.2, “ESBWR Vertical SSE Design Ground Response Spectra at Foundation Level,” and ESBWR Tier 2, Figure 2.0-2, “ESBWR Vertical SSE Design Ground Response Spectra at Foundation Level,” are replaced by the Unit 3 updated GMRS shown in FSAR Figure 2.0-202.[1]

As the low frequency seismic spectra exceedance is a departure from Tier 1 information, an exemption is required. Exemption Request 3.1, in Section 3.0, Exemption Requests, is presented to fulfill this requirement.

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[1] As noted in FSAR Table 2.0-201, FSAR Figures 2.0-201 and 2.0-202 were taken from FSAR Figures 2.5.2-233 and 234, respectively.

2.0 VARIANCES

A *variance* is a plant-specific deviation from one or more of the site characteristics, design parameters, or terms and conditions of an ESP or from the site safety analysis report (SSAR).

The following sections provide requests for variances from the proposed site characteristics for the Grand Gulf ESP. The requests comply with the requirements of 10 CFR 52.39 and 10 CFR 52.93. To support a decision whether to grant a variance, each variance request provides the technical justification and supporting cross-references to the Unit 3 FSAR information that meet the technically relevant regulatory acceptance criteria.

In accordance with 10 CFR 52.79(b)(2) and 10 CFR 52.39(d), where the Unit 3 FSAR references the Grand Gulf ESP and does not demonstrate that the design of Unit 3 falls within the ESP site characteristics, or where the Unit 3 FSAR does not incorporate the ESP SSAR information by reference without the need for certain changes, this COLA includes the following requests for variances:

GGNS ESP VAR 2.0-1:	Design Response Spectra
GGNS ESP VAR 2.0-2:	Minimum Shear Wave Velocity of Soil at the Proposed Plant Foundation Level
GGNS ESP VAR 2.0-3:	Accident Analyses
GGNS ESP VAR 2.3-1:	Determination of Roof Loads Due to Extreme Winter Precipitation
GGNS ESP VAR 2.4.1-1:	Distance to Closest Surface Water
GGNS ESP VAR 2.4.12-1:	Highest Ground Water Elevation

Variance: GGNS ESP VAR 2.0-1 – Design Response Spectra

Request

A variance is requested from the site characteristic of design response spectra established in ESP-002, Appendix A, Figure 2, “Grand Gulf, Median 10^{-5} Annual Probability of Exceedance (APE) Vertical Motion at Soil Surface.” ESP-002, Appendix A, Figure 2, is replaced by the updated Ground Motion Response Spectra (GMRS) shown in FSAR Figure 2.0-201, “Unit 3 ESBWR Horizontal Design Ground Motion Response Spectra Comparison at Reactor Building Foundation Level,” and FSAR Figure 2.0-202, “Unit 3 ESBWR Vertical Design Ground Motion Response Spectra Comparison at Reactor Building Foundation Level.”

Justification

The Safe Shutdown Earthquake (SSE) ground motions for the GGNS ESP site were developed in accordance with Regulatory Guide 1.165. Since development and NRC review of the GGNS ESP SSAR, the NRC released Regulatory Guide 1.208 (March 2007) which provides an alternative for use in satisfying the requirements set forth in 10 CFR 100.23. The approach to develop the Unit 3 GMRS builds on data and analyses that were conducted for the GGNS ESP SSAR. Additional earthquake events that occurred in the Gulf of Mexico following approval of the GGNS ESP SSAR required updating the Probabilistic Seismic Hazard Analyses (PSHA) and re-analyzing site response. The seismic source model and PSHA used to develop the GMRS for Unit 3 is described in FSAR Section 2.5.2. Regulatory Guide 1.208, along with these other factors, were used to develop an updated GMRS for Unit 3.

Therefore, the design response spectra established in ESP-002, Appendix A, Figure 2, is replaced by the Unit 3 updated GMRS shown in FSAR Figure 2.0-201 and FSAR Figure 2.0-202. This is acceptable because the requirements of 10 CFR 100.23 continue to be satisfied, and the development of the updated GMRS conforms to Regulatory Guide 1.208.

Variance: GGNS ESP VAR 2.0-2 – Minimum Shear Wave Velocity of Soil at the Proposed Plant Foundation Level

Request

A variance is requested from use of the SSAR and the ESP-002, Appendix A, Section 2.5, site characteristic of minimum shear wave velocity of soil at the proposed plant foundation level. This is a request to use the DCD, Table 2.0-1, site design parameter of equivalent uniform shear wave velocity for the soil property.

As indicated in ESP SSAR Section 2.5.4.6, the minimum required shear wave velocity at the foundation level for all reactor types considered for the GGNS ESP site is 1,000 feet per second (fps). Additionally, in ESP-002, Appendix A, Section 2.5, the stability of subsurface materials and foundations site characteristic is specified as 1000 fps for minimum shear wave velocity of soil at the proposed plant foundation level.

Revision 2 of the ESBWR DCD (26A6642AH), Table 2.0-1, Note 8, indicated the design parameter soil property for minimum shear wave velocity to be defined as the minimum shear wave velocity at low strains after the soil property uncertainties have been applied (minimum value of 1000 fps specified). In Revision 3 of the DCD, Note 8, of Table 2.0-1, was revised to the following:

> "(8) This is the equivalent uniform shear wave velocity (V_{eq}) at seismic strains after the soil property uncertainties have been applied. V_{eq} is calculated to achieve the same wave traveling time over the depth equal to the embedment depth plus 2 times the largest foundation plan dimension below the foundation as follows:
>
> $V_{eq} = \sum d_i / (\sum d_i/V_i)$

where d_i and V_i are the depth and shear wave velocity, respectively, of the i^{th} layer. The ratio of the largest to the smallest shear wave velocity over the mat foundation width at the foundation level does not exceed 1.7."

This site design parameter, required by the current DCD, of equivalent uniform shear wave velocity for the soil property is therefore not the same as the site characteristic given in Appendix A of the ESP, nor that indicated in the SSAR Section 2.5.4. Therefore, a variance is requested from use of the ESP and from the SSAR minimum shear wave velocity characteristics which has been superseded by the DCD equivalent uniform shear wave velocity site parameter.

Justification

The site characteristic for shear wave velocity in the SSAR, and reiterated in the ESP, was based on input from various reactor vendors, who provided input to the bounding Plant Parameters Envelope developed for the ESP application as described in SSAR Section 1.3. GE-Hitachi Nuclear Energy has redefined the criterion for this site characteristic in the ESBWR DCD, Revision 3, to be an equivalent uniform shear wave velocity (V_{eq}) over an entire soil column at seismic strain, and provided the methodology for determining V_{eq} from site data. This use of an equivalent uniform shear wave velocity is consistent with the method provided in the referenced DCD and, therefore, the variance is acceptable. The required minimum value for uniform shear wave velocity, V_{eq}, established in the DCD (Table 2.0-1) is 1000 fps; the GGNS site characteristic value for V_{eq} of 1331 fps bounds the DCD value.

Variance: GGNS ESP VAR 2.0-3 – Accident Analyses

Request

A variance is requested from the ESP-002, Appendix B parameters and the SSAR accident analyses presented in SSAR Section 3.3. This is a request to use the DCD 15.4 analyses of design basis accidents, as DCD 15.4 provides the required analyses of design basis accidents for the ESBWR and supersedes SSAR 3.3.

As discussed in SSAR 3.3, 10 CFR 52.17(a)(1) required that the SSAR demonstrate the acceptability of the (ESP) site under the radiological consequences evaluation factors identified in §50.34(a)(1) and that site characteristics comply with 10 CFR 100. Specifically, 10 CFR 100.21(c)(2) requires that radiological dose consequences of postulated accidents meet the criteria set forth in 10 CFR 50.34(a)(1). Therefore, SSAR 3.3 analyzed a set of postulated accidents to demonstrate that a reactor or reactors bounded by parameters defined therein, could be operated on the ESP Site without undue risk to the health and safety of the public.

Accident analyses evaluated in the SSAR 3.3 were based on accidents and associated source terms for a range of possible reactor designs, including the ABWR, AP1000 and the ACR-700 plant designs. Based on these analyses, the design basis accident source term parameters were established for the site in the ESP-002, Appendix B.

Comparison of DBA source terms evaluated for the ESBWR in DCD Section 15.4 are not bounded by the ESP-002 source terms specified in all cases. Therefore, a variance from the ESP Appendix B parameters and the SSAR accident analyses presented in SSAR Section 3.3 is requested. DCD 15.4 provides the required analyses of design basis accidents for the ESBWR and supersedes SSAR 3.3.

Justification

This is acceptable because calculated doses for the ESBWR design are shown in DCD Section 15.4 to be within limits set by regulatory guidance documents and applicable regulations. These DCD analyses determined accident dose results based on (surrogate) site parameters for short term (accident) meteorological dispersion factors (X/Q). GGNS site-specific short term X/Q values are demonstrated in Table 2.0-201 to fall within (are less than) the associated DCD parameters. Therefore, the dose consequence for the accidents evaluated in DCD Section 15.4 are bounding and applicable for the GGNS site, and as shown in DCD 15.4 analyses, are within limits set by regulatory guidance documents and applicable regulations.

Design specific source terms, accident selections, mitigation system performance, resultant dose consequences, etc. are presented and evaluated for the referenced ESBWR DCD design in DCD 15.4. Therefore, the safety analyses of DCD 15.4 supersede the analyses provided in SSAR Section 3.3 (as noted in FSAR Table 1.1-202).

Variance: GGNS ESP VAR 2.3-1 - Determination of Roof Loads Due to Extreme Winter Precipitation

Request

A variance is requested from the SSAR methodology for determination of roof loads due to extreme winter precipitation, and to the requirement of ESP-002, Appendix A to use the 48-hour probable maximum winter precipitation (PMWP) in determining extreme winter precipitation loads for Unit 3 roofs at the Grand Gulf site. The ESP-002, Appendix A, Section 2.3, site characteristic definition of 48-Hour PMWP states: "Probable maximum precipitation during the winter months (to be used in conjunction with the 100-year snowpack in determining extreme winter precipitation loads for roofs)". A variance is requested from use of this “default” method for determination of winter precipitation roof loads stated in the ESP definition for the site characteristic of 48-hr PMWP.

SSAR Section 2.3.1.2.6 defines the extreme live load associated with winter precipitation to be used as the site characteristic for roof design to be the sum of the 100-yr return snowpack weight (SSAR Section 2.3.1.2.4) and the weight of a 100-yr return frozen precipitation, determined from recent ice storm data for the Grand Gulf site area (SSAR Section 2.3.1.2.5). Using this methodology, a value of 16 psf was determined for the extreme live loads to be used for safety related roof structural design for the ESP facility.

The NRC staff approved the SSAR 2.3.1.2.4 value for the 100-yr return snowpack weight in NUREG-1840, Section 2.3.1.3, and incorporated the characteristic into ESP-002, Appendix A. However, NUREG-1840, Section 2.3.1.3, provided the following regarding the SSAR determination of extreme winter precipitation load for roof design for a plant that might be constructed on the GGNS ESP site:

> Both the weight of the 100-year return period snowpack and the weight of the 48-hour PMWP are specified in RG 1.70 to assess the potential snow loads on the roofs of safety-related structures. The staff's branch position on winter precipitation loads provides clarification as to the load combinations to be used in evaluating the roofs of safety-related structures. Consistent with the staff's branch position on winter precipitation loads, the winter precipitation loads to be included in the combination of normal live loads to be considered in the design of a nuclear power plant that might be constructed on a proposed ESP should be based on the weight of the 100-year snowpack or snowfall, whichever is greater, recorded at ground level. Likewise, the winter precipitation loads to be included in the combination of extreme live loads to be considered in the design of a nuclear power plant that might be constructed on a proposed ESP [site] should be based on the weight of the 100-year snowpack at ground level plus the weight of the 48-hour PMWP at ground level for the month corresponding to the selected snowpack. A COL or CP applicant may choose and justify an alternative method for defining the extreme winter precipitation load by demonstrating that the 48-hour PMWP could neither fall nor remain on the top of the snowpack and/or building roofs.
>
> In its submittal dated June 21, 2005, the applicant contended that the HMR 53 48-hour PMWP value of 35 inches is in the form of rainwater that would not remain on rooftops. Instead, the applicant proposed a 48-hour frozen PMWP value of 1.9 inches of frozen precipitation (equivalent to 9.9 lbf/ft2) for use in defining extreme live loads for roof design purposes. The applicant's 48-hour frozen PMWP value represents a 100-year return period value statistically extrapolated from four ice storms recorded in nearby counties and parishes during the 11-year period 1993-2003. The applicant proposed defining the snow load for extreme live loads to be considered for roof structural design purposes as 16 lbf/ft2, which represents the sum of the 1 00-year return period snowpack (6.1 lbf/ft2) and the 48-hour frozen PMWP (9.9 lbf/ft2).
>
> The staff believes that the 11-year period of record used to derive the 48-hour frozen PMWFP value of 9.9 lbf/ft2 is too short, resulting in an unacceptably large uncertainty in the resulting value ....
>
> Therefore, the staff contends that, until a roof design has been established, the "default" winter precipitation loads to be included in the combination of extreme live loads to be considered the design of a nuclear power plant that might be constructed at the Grand Gulf ESP site should be based on the weight of the 100-year snowpack at ground level plus the weight of the 48-hour PMWFP. <u>Once the roof design has been established, a COL or CP applicant may then choose and justify an alternative method for defining the extreme winter precipitation load by demonstrating that the 48-hour PMWP could neither fall</u>

nor remain on the top of the snowpack and/or building roofs based on the design of the roof and its drains. [emphasis added]

Justification

DCD Table 2.0-1 indicates in Note (5) that the ESBWR structures, "Roof scuppers and drains are designed independently to limit water accumulation on the roof to no more than 100 mm (4 in.) during PMWP conditions." ASCE 7 indicates a requirement to add a “rain-on-snow” surcharge to the winter precipitation roof loads that would apply for the Grand Gulf site. Therefore, it is reasonable to use a maximum depth of rain water on the roofs of 4 in., rather that the entire weight of the 48-hour PMWP, to determine the extreme winter precipitation roof loads to be used for facility design.

FSAR 2.3.1.2.6 indicates the methodology used to determine the winter precipitation loads for roof design. The methods are consistent with the design capability of the Unit 3 roof scuppers and drainage systems, ASCE 7 methodology is used to define the weight of the snow load based on the approved 100-year snowpack identified in SSAR 2.3.1.2.4, and an appropriate rain-on-snow surcharge is added to the loads in accordance with ASCE 7. The overall roof load from winter precipitation of 29.5 psf is conservative for the Grand Gulf area where winter precipitation is light, this is consistent with the ESBWR standard plant design, and is well within the ESBWR design requirements of 60 psf as provided in the DCD Table 2.0-1, therefore, the variance is acceptable.

Variance: GGNS ESP VAR 2.4.1-1 – Distance to Closest Surface Water

Request

A variance is request from the ESP-002, Appendix A, Section 2.5, site characteristic of 1017 ft. distance to the closest surface water.

ESP-002, Appendix A, Section 2.4, provides site characteristics related to hydrology. The site characteristic of "distance to closest water body" is defined as "distance to closest surface water body from center of ESP powerblock." The permit specifies this site characteristic value as 1017 ft. based on the distance between the center of the ESP powerblock area (powerblock area as defined in SSAR Section 2.1.2 and depicted in SSAR Figure 2.1-2) and Stream/Sedimentation Basin B to the south of the powerblock area. The distance from the center of the Unit 3 power block (reactor containment building) to the closest approach of Stream B and Sedimentation Basin B is approximately 680 ft; thus, the distance is less than the permit value of 1017 ft. Based on the layout of the ESBWR standard plant structures, the radwaste building is approximately 20 ft. further from Stream B, still less than the permit value of 1017 ft. This closer distance to surface water is considered a variance from ESP-002.

Justification

Stream B drains Basin B (ESP SSAR Figure 2.4-10) and flows into Sedimentation Basin B, which then flows (over the weir that establishes the sedimentation basin) to

Hamilton Lake and on to the Mississippi River. Stream B, Sedimentation Basin B, and Hamilton Lake are not water sources for any use or application for Unit 3. The nearest potable water supply using water from the Mississippi River is located over 100 miles downstream. Groundwater on the site generally flows from east to west, towards the Mississippi River as discussed in FSAR Section 2.4.12. During flood conditions, the ground water flow direction is temporarily reversed at the site. However, the ground water flow direction returns to normal after flood conditions wane, and the radiological contaminants would again move toward the river.

The analysis of the bounding release of radioactive liquid effluents to groundwater and consequently to the surface water pathway is provided in FSAR 2.4.13. Specifically, the transport model and pathway, including the relative location and proximity of Stream B and Sedimentation B is considered in this analysis. While the groundwater flow is not toward these surface water features to the south of the radwaste building, as discussed above, the analysis in FSAR 2.4.13 conservatively determines radionuclide concentrations in groundwater at a distance of 600 ft. from the release point (that is, the radwaste building). The radwaste building is located such that the distance from it to Sedimentation Basis B (which is fed by Stream B), directly to the south, is approximately 700 ft. As discussed in FSAR 2.4.13.2.4, all radionuclides from the hypothetical release are well within 10 CFR 20 limits at a distance of 600 ft. from the release point. See FSAR Section 2.4.13 for additional discussion of this analysis.

Therefore, the relative distance of approximately 680 ft. between the Unit 3 powerblock and the closest point of approach to Stream B and Sedimentation Basin B is acceptable for the following reasons:

- The general flow of groundwater is to the west of the plant,
- Stream B and Sedimentation Basin B are to the south of the powerblock, and
- Transport analysis results in FSAR Section 2.4.13 show 10 CFR 20 limits are met at a distance less than that to these surface water features.

Variance: GGNS ESP VAR 2.4.12-1 – Highest Groundwater Elevation

Request

A variance is requested from the ESP-002, Appendix A, Section 2.4, site characteristic of highest groundwater elevation of 70 ft. below grade.

Justification

FSAR 2.4.12 provides a maximum measured groundwater elevation of 75.8 ft msl. FSAR 2.4.1 provides the plant grade elevation of 133.5 ft msl. Therefore, the maximum ground water level is about 58 ft below plant grade (133.5-75.8=57.7). The site parameter specified in DCD Table 2.0-1, for the ESBWR standard plant, is 2 ft. below grade. Some of the groundwater elevations measured in wells near the center of the power block during the Unit 3 investigations are higher than 62.5 ft. above msl; however, none are higher than the design maximum groundwater level requirement of 2 ft. below plant grade. Therefore, this is acceptable because all measured groundwater elevations are well below the DCD site parameter required for the ESBWR standard plant.

3.0 EXEMPTION REQUESTS

An *exemption* must be obtained if information proposed in the COL application is inconsistent with one or more NRC regulation. Exemptions are submitted pursuant to 10 CFR 52.7 and 52.93 and must comply with the special circumstances in 10 CFR 50.12(a).

Accordingly, Subsections 3.1 and 3.2 contain requests for specific exemptions from requirements contained in 10 CFR 52.79 and 10 CFR Part 26.

3.1 Seismic Spectra Exceedance Exemption Request

Pursuant to 10 CFR 52.7 and Section VIII.A.4 of the design certification rule for the ESBWR, the Applicants hereby request an exemption from the requirements of 10 CFR 52.79(d)(1) and Tier 1 of the ESBWR Design Control Document (DCD), which requires the final safety analysis report to demonstrate that the site characteristics fall within the site parameters specified in the design certification. At low frequencies, the site seismic response spectra exceed the Certified Seismic Design Response Spectra (CSDRS). Since the CSDRS are Tier 1 information, any exceedance from the spectra requires an exemption from 10 CFR 52.79(d)(1) and Tier 1, in accordance with 10 CFR 52.7 and Section VIII.A.4 of the design certification rule for the ESBWR.

Discussion

As discussed in departure GGNS DEP 2.0-1, the Unit 3 horizontal and vertical response spectra are bounded by the ESBWR horizontal and vertical response spectra, except for frequencies below approximately 0.2 Hz. FSAR Figure 2.0-201, “Unit 3 ESBWR Horizontal Design Ground Motion Response Spectra Comparison at Reactor Building Foundation Level,” and FSAR Figure 2.0-202, “Unit 3 ESBWR Vertical Design Ground Motion Response Spectra Comparison at Reactor Building Foundation Level,” provide the site-specific horizontal and vertical ground motion response spectra (GMRS), which are bounded by the ESBWR horizontal and vertical ground response spectra, except for frequencies below approximately 0.2 Hz for horizontal spectra and 0.15 Hz for vertical spectra. Therefore, the ESBWR DCD Tier 1 Figure 5.1-1, “ESBWR Horizontal SSE Design Ground Spectra at Foundation Level,” and the ESBWR DCD Tier 2 Figure 2.0-1, “ESBWR Horizontal SSE Design Ground Spectra at Foundation Level,” are replaced by the Unit 3 updated GMRS shown in FSAR Figure 2.0-201. In addition, Tier 1 Figure 5.1.2, “ESBWR Vertical SSE Design Ground Response Spectra at Foundation Level,” and Tier 2 Figure 2.0-2, “ESBWR Vertical SSE Design Ground Response Spectra at Foundation Level,” are replaced by the Unit 3 updated GMRS shown in FSAR Figure 2.0-202.[2]

[2] As noted in FSAR Table 2.0-201, FSAR Figures 2.0-201 and 2.0-202 were taken from FSAR Figures 2.5.2-233 and 234, respectively.

The Unit 3 vertical GMRS is compared with the ESBWR vertical SSE design ground spectra in FSAR Figure 2.5.2-234 (and FSAR Figure 2.0-202). The Unit 3 horizontal GMRS is compared with the ESBWR horizontal SSE design ground spectra in FSAR Figure 2.5.2-233 (and FSAR Figure 2.0-201).

As stated in FSAR 3.7.1.1.4, the low frequency exceedance in the horizontal and vertical spectra does not have an adverse impact on the seismic design of the ESBWR standard plant because:

(a) There are no structural frequencies below 0.2 Hz. In the frequency range of importance to structural response (frequencies greater than 0.2 Hz), the CSDRS are higher and there is no exceedance at the higher frequencies.

(b) Although pools in the Reactor Building/Fuel Building have sloshing frequencies less than 0.2 Hz, sloshing response is only a small portion of overall seismic-induced hydrodynamic loads on the pool structure and does not govern. The majority of hydrodynamic loads are due to the impulsive response of the water. Impulsive response is a function of pool structure response at structural frequencies. The Foundation Input Response Spectra (FIRS) are enveloped by the CSDRS in the frequency range of importance to structural response (frequencies greater than 0.2 Hz). The impulsive response inherent in the CSDRS-based design is typically an order of magnitude higher than the sloshing response at lower accelerations of the FIRS.

(c) The CSDRS for the Fire Water Service Complex (FWSC) is 1.35 times the RBFB/CB CSDRS. The FWSC sloshing frequency is 0.24 Hz and is enveloped by the CSDRS.

(d) The higher FIRS below 0.2 Hz is irrelevant to the Control Building (CB) because the CB does not contain water pools.

(e) The vertical exceedance at frequencies below 0.15 Hz is inconsequential because vertical earthquake components do not induce sloshing.

Therefore, this low frequency exceedance does not have an adverse impact.

<u>Conclusion</u>

As the exceedance is minimal and is in a frequency range which has little to no effect on the facility, the change will not result in a significant decrease in the level of safety otherwise provided by the certified design.

This exemption request was evaluated per Section VIII.A.4 of the design certification rule which requires that 1) the change will not result in a significant decrease in the level of safety otherwise provided by the design; 2) the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; 3) special circumstances are present as specified in 10 CFR 50.12(a)(2); and 4) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption. As shown below, each of these four criteria are satisfied.

(1) As discussed above, the change does not have an adverse impact and therefore will not result in a significant decrease in the level of safety otherwise provided by the design.
(2) The exemption is not inconsistent with the Atomic Energy Act or any other statute and therefore is authorized by law. As discussed above, the change does not have an adverse impact and therefore will not present an undue risk to the public health and safety. The change does not relate to security and does not otherwise pertain to the common defense and security.
(3) Special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present, since application of Section 52.79(d)(1) and the site parameters in Tier 1 of the DCD is not necessary to achieve their underlying purpose of the rules. The analysis described above shows that the exceedance from the CSDRS does not affect the design. Additionally, special circumstance (iii) is present, since compliance would necessitate relocating the facility to another site, which would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted.
(4) The special circumstances outweigh any decrease in safety that may result from the reduction in standardization (due to the low frequency exceedance) caused by the exemption. Specifically, the change does not have an adverse impact and does not affect the configuration of the plant or the manner in which the plant is operated.

As demonstrated above, this exemption request complies with the requirements in Section VIII.A.4 of Appendix the design certification rule for the ESBWR.

3.2 Fitness for Duty Exemption Request

Pursuant to 10 CFR 52.7, the Applicants hereby requests an exemption from the requirement of 10 CFR 52.79(a)(44) to provide a description of the fitness-for-duty (FFD) program required by 10 CFR Part 26 and its implementation in its application for a combined operating license for its Grand Gulf Nuclear Station, Unit 3. The Applicants propose to provide the FFD Program description required by 10 CFR 52.79(a)(44) based on the revised 10 CFR Part 26 regulations that are expected to be promulgated and become effective in early 2008. Special circumstances are present, as discussed in this request.

<u>Discussion</u>

In an April 17, 2007, affirmation session (ref. M070417B), the Commission approved a final rule amending FFD regulations in 10 CFR Part 26 for both the construction and operating phases for a new nuclear plant. The new and revised Part 26 regulations are expected to be promulgated and become effective in 2008.

The construction phase of the FFD Program, as applied to new plants, is not required to be implemented until the commencement of on-site construction of safety- or security-related systems, structures and components. The Applicants would not begin these activities until after the amendments to 10 CFR Part 26 regulations take effect. The operational phase of the FFD Program is required to be implemented prior to fuel load.

In view of the near-term effectiveness of new FFD regulations, it would be more efficient for both the Applicants and the NRC to submit the FFD Program description required by 10 CFR 52.79(a)(44) based on the revised Part 26 rules rather than the rules currently in effect.

The pending issuance of the amendments to Part 26 creates “special circumstances,” as defined in 10 CFR 50.12 (Specific Exemptions) that warrant granting this exemption. Namely: the exemption would provide only temporary relief from the applicable regulation, and the Applicants have made good faith efforts to comply with 10 CFR 52.79; applying the current FFD regulations in reviewing the FFD Program description required by 10 CFR 52.79(a)(44) would not serve, and is not necessary to achieve, the underlying purposes of the rule; and the underlying purpose of 10 CFR 52.79(a)(44) can be satisfied by meeting the requirements of the revised FFD regulations that will become effective in the near future.

Moreover, compliance with the current rule would cause undue hardship for the Applicants and would also be inefficient and burdensome for the NRC staff. That approach would require the Applicants to prepare, and NRC to review, information based on Fitness for Duty regulations that will soon be superseded by Part 26 amendments, and then (presumably) complete a similar submittal under the revised FFD rules.
The Grand Gulf Unit 3 FFD Program, when implemented, will meet the requirements contained in the revised 10 CFR Part 26 regulations that are expected to be issued and become effective in early 2008.

<u>Conclusion</u>

In view of the expected near-term implementation of new FFD regulations and the fact that the FFD Program for Grand Gulf Unit 3 will not be implemented until after the new Part 26 regulations take effect, it would be more efficient for the NRC and for the Applicants to submit a FFD program description based on the expected revised Part 26 rules rather than the rules currently in effect.

This approach, which is authorized by law, would allow the NRC to conduct its acceptance review of the Grand Gulf Unit 3 combined license application based on the revised rules that will become effective in the near future. The exemption is not inconsistent with the Atomic Energy Act or any other statute and therefore is authorized by law. The exemption pertains to the timing of submission of information and not the substance of the information that will ultimately be in the COL application. Because no other approvals will be given until after the revised Part 26 rules take effect, the exemption will not present an undue risk to the public health and safety and the design change does not relate to security and does not otherwise pertain to the common defense and security.