

August 23, 2007

Mr. R. M. Krich, Senior Vice President
Regulatory Affairs
UniStar Nuclear
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Baltimore, MD 21202-3106

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 3, STATUS OF THE
ACCEPTANCE REVIEW OF PART ONE OF THE COMBINED LICENSE
APPLICATION

Dear Mr. Krich:

On July 13, 2007, as supplemented on July 16, and August 2, 2007 (ADAMS Accession Nos. ML071980294, ML072000363, and ML072200533), UniStar Nuclear (UniStar) submitted a partial combined license (COL) application to the U.S. Nuclear Regulatory Commission (NRC) for an U.S. EPR reactor to be located adjacent to the Calvert Cliffs Nuclear Power Plant, Units 1 and 2 (CCNPP1 and 2), in Lusby, Maryland. This potential new nuclear plant is to be designated CCNPP, Unit 3 (CCNPP3). The partial application included the Environmental Report (ER) required by 10 CFR 50.30(f), which is intended to disclose the environmental impacts of construction and operation of CCNPP3.

The staff is nearing completion of its acceptance review of your partial COL application. In many parts of your application, the information provided meets NRC regulations with respect to the level of detail necessary to begin the evaluation of the COL application. However, certain issues in the application have not yet been addressed to the level of detail expected by the staff. This may be due, in part, because the necessary information relies upon details that would be provided as part of the U.S. EPR design certification later in the year or upon information or analyses that have not been obtained or performed. Consequently, the detailed design information that is necessary to meet the requirements for the initial submittal of a two-part application is not yet complete; in addition, there are some issues in the ER that are not complete as well. We are providing you a list of these deficiencies in the enclosure for your information. Please provide a plan for submitting sufficient information to address these issues so that the staff may allocate appropriate resources to complete the acceptance review and continue processing your application.

Background and Discussion

UniStar submitted part one of the COL application pursuant to Subpart C of Part 52 of Title 10 of the *Code of Federal Regulations* (10 CFR) 2.101(a)(5), the latter of which allows a COL application to be submitted in two parts: essentially the ER and final safety analysis report (FSAR). The partial application submitted on July 13, 2007 included the ER. In addition, UniStar submitted FSAR Chapter 2, "Site Characteristics," and other information to address the requirements of 10 CFR 2.101(a)(5). UniStar also submitted an exemption request from certain

requirements of 10 CR 2.101(a)(5) stating that special circumstances exist such that application of some of these requirements would not serve, nor is it necessary to achieve, the underlying purpose of the rule.

Meeting regulatory requirements, with respect to the information necessary to be submitted to support a COL application, as outlined in applicable NRC regulations including 10 CFR Parts 51 and 52 and 10 CFR 2.101 is the principal focus of the staff's acceptance review. The ER must contain information that addresses the requirements in 10 CFR 51.45 and the relevant requirements in 10 CFR 51.50. An applicant for a partial COL must also submit information in the following areas to address the requirements of 10 CFR 2.101(a)(5): (1) the information addressing the requirements of 10 CFR 50.33, "Contents of Applications; General Information"; (2) the information addressing the requirements of 10 CFR 50.34(a)(1), which is essentially the FSAR Chapter 2, "Site Characteristics," and some site- and design-specific radiological consequence analysis which is usually contained in FSAR Chapter 15, "Transient and Accident Analysis"; and, (3) information addressing the requirements of 10 CFR 50.37, "Agreement Limiting Access to Classified Information."

Please note that none of the issues listed in the enclosure are affected by the exemption request that UniStar submitted regarding using the requirements of the recently revised 10 CFR 2.101(a)(5). The additional FSAR information required to accompany the first part of a COLA as detailed in 10 CFR 2.101(a)(5) addresses the suitability of the site with respect to possible man-made and natural hazards, and with potential radiological consequences of postulated accidents and the release of fission products. While the regulations contain requirements regarding a description of the facility, and the safety assessment containing an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors, they also indicate that the applicant is to include an evaluation and analysis of the postulated fission product release, using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate the consequences of the accidents, together with applicable site characteristics, including site meteorology, to evaluate the offsite radiological consequences. Furthermore, the site characteristics must comply with 10 CFR Part 100, "Reactor Site Criteria."

Over the past several years, the staff has been working with all stakeholders, including the industry, to provide insights on the appropriate level of detail that is necessary for a COL application. As a result of these efforts, the NRC recently published Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants," June 2007. Regulatory Guide 1.206 addresses an acceptable approach to demonstrate conformance with the regulatory requirements in terms of level of technical detail. As part of the NRC staff's acceptance review, NRC regulations, RG 1.206 and other RGs are used to determine whether the application meets the requirements; i.e., the acceptance review for the purposes of docketing the application and initiating the technical review.

As you may be aware, other review guidance will be used by the staff in the future to determine whether the thoroughness and quality of the submittal are technically sufficient to establish a firm schedule for conducting the review. The Commission has directed the staff to conduct the more rigorous review only after it publishes the guidance for the review; the Commission will provide a 60-day review period for this sufficiency review. Your COL application was not subject to the more rigorous review, but the additional guidance may provide you with insights

regarding the NRC's expectations during the conduct of the review. The additional review guidance includes NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," March 2007, and NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," October 1999. This guidance will be used as part of a subsequent sufficiency review to finalize the schedule. These documents address the expectations of the staff regarding the type and detail of information that is necessary to conduct the NRC's review of applications after they are accepted for review.

During the conduct of the staff's acceptance review, we identified additional issues that may lead to requests for additional information (RAIs) after the application is accepted. We will provide that information in separate correspondence.

For planning purposes, we do need information regarding your schedule for providing the information listed in the enclosure, so that we can resolve when the NRC can make a determination regarding the acceptability of your application. Please provide us with your written response as soon as practicable. If you would like to meet to discuss these issues, please let us know so that we may plan appropriately for a date, time, and location for the public meeting.

Sincerely,

/RA/

David B. Matthews, Director
Division of New Reactor Licensing
Office of New Reactors

Project No. 746

Enclosure: Outstanding Issues for Acceptance Review

cc w/encl: See next page

Reports for Nuclear Power Plants," March 2007, and NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," October 1999. This guidance will be used as part of a subsequent sufficiency review to finalize the schedule. These documents address the expectations of the staff regarding the type and detail of information that is necessary to conduct the NRC's review of applications after they are accepted for review.

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OUTSTANDING ISSUES TO COMPLETE
THE STAFF'S ACCEPTANCE REVIEW
OF THE PARTIAL COMBINED LICENSE APPLICATION
FOR CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 3

Information required by 10 CFR 50.34(a)(1)

1. Final Safety Analysis Report (FSAR) Section 2.4.2, "Floods"

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.34(a)(1), the staff uses RG 1.206, "Combined License Applications for Nuclear Power Plants." RG Section C.I.2.4.2 guidance indicates that a COL applicant should "describe the effects of local probable maximum precipitation (see Section C.I.2.4.3.1 of this guide) on adjacent drainage areas and site drainage systems, including drainage from the roof structures." Also the applicant should "provide sufficient details concerning the site drainage system to permit the following actions: (1) independent review of rainfall and runoff effects on safety-related facilities, (2) judgement concerning the adequacy of design criteria, and (3) independent review of the potential for blockage of site drainage as a result of ice, debris, or similar material."

In its application the applicant mentioned bio-retention ditches, overflow pipes, and culverts (in FSAR Chapter 2.4.2) but did not specify the locations and dimensions. Information must be submitted to provide sufficient details concerning the on-site drainage system to ensure the safety of the proposed structures, systems, and components from local flooding. The applicant has not submitted this information nor did it propose an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1).

2. FSAR Section 2.4.10, "Flooding Protection Requirements"

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.34(a)(1), the staff uses RG 1.206, "Combined License Applications for Nuclear Power Plants." RG Section C.I.2.4.10 guidance indicates that a COL applicant should "... describe the static and dynamic consequences of all types of flooding on each pertinent safety-related facility. It should present the design bases required to ensure the safety-related facilities will be capable of surviving all design flood conditions, and reference appropriate discussions in other section of the FSAR where the design bases are implemented. The applicant referred to but did not provide the information to describe the forces and design basis loadings required for flood protections of the intake structures. The staff recognizes that this information is usually addressed in FSAR Section 3.8 but this information is material to the staff's review of FSAR Section 2.4.10.

Enclosure

Information must be submitted to provide sufficient details concerning flood protection requirements. The applicant has not submitted this information nor did it propose an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1).

3. FSAR Section 2.5.2, “Vibratory Ground Motion”

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.34(a)(1), the staff uses RG 1.206, “Combined License Applications for Nuclear Power Plants,” which references RG 1.208, “A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion.” RG 1.208, Appendix C, Section 2.5.1, states that “. . . a laboratory testing program should be carried out to identify and classify the subsurface soils and rocks and to determine their physical and engineering properties. Laboratory tests for both static and dynamic properties (e.g., shear modulus, damping, liquefaction resistance, etc) are generally required. The dynamic property tests should include cyclic triaxial tests, cyclic simple shear tests, cyclic torsional shear tests, and resonant column tests (RCTS), as appropriate.” Furthermore the RG documents that, “sufficient laboratory test data should be obtained to allow for reasonable assessments of mean values of soil properties and their potential variability.”

The applicant did not provide adequate test data for defining response of site-specific soil and rock materials to dynamic loading for safe shutdown earthquake (SSE) determination in FSAR Section 2.5.2. In FSAR Section 2.5.4.2.1.7, “Laboratory Testing Program” (pg 2.5.4-22), the applicant stated that RCTS testing results are expected to become available at a later date. Therefore, the applicant has not submitted this information nor did it propose an acceptable alternative. Consequently, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1).

4. FSAR Section 2.5.4, “Stability of Subsurface Materials and Foundations”

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.34(a)(1), the staff uses RG 1.206. RG 1.206, Section C.I.2.5.4.7 states that an applicant should “. . . provide a description of the response of soil and rock to dynamic loading, including the following considerations: . . . (3) results of dynamic tests in the laboratory on samples of soil and rock to determine the shear modulus and damping degradation with strain; (4) results of soil-structure interaction analysis.” The shear modulus reduction and damping ratio curves, which are vital to the staff’s eventual of the site seismic response and SSI analyses, can only be confirmed and validated by laboratory testing. The applicant has not provided this testing data nor did it propose an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1).

5. FSAR Section 2.5.4, “Stability of Subsurface Materials and Foundations”

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.34(a)(1), the staff uses RG 1.206, “Combined License Applications for Nuclear Power Plants.” RG Section C.I.2.5.4.5 guidance indicates that a COL applicant should “. . . discuss the following data concerning excavation, backfill and earthwork analysis at the site: (1) Sources and quantities of backfill and borrow; (2) Extent (horizontally and vertically)

of all seismic Category I excavations, fills, and slopes; (3) Compaction specifications and embankment and foundation designs; (4) Dewatering and excavation methods and control of ground water during excavation to preclude degradation of foundation materials.” The applicant has not submitted this information nor did it propose an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1).

6. FSAR Section 2.5.4, “Stability of Subsurface Materials and Foundations”

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.34(a)(1), the staff uses RG 1.206, “Combined License Applications for Nuclear Power Plants.” RG Section C.I.2.5.4.10 guidance indicates that a COL applicant should “. . . describe an analysis of the stability of all safety-related facilities for static loading conditions. Describe the analysis of foundation rebound, settlement, differential settlement, and bearing capacity under the dead loads of fills and plant facilities. Include a discussion and evaluation of lateral earth pressures and hydrostatic group water load acting on plant facilities.” The applicant has not submitted this information nor did it propose an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1).

7. Information submitted pursuant to 10 CFR 50.34(a)(1)(ii)(D) (The applicant stated that information to address this requirement was submitted in ER Chapter 7)

The information that must be submitted to address this requirement should include description and analysis that reflects the radiological consequences that might result from a postulated accident involving release of fission products. Attention should be given to a discussion about specific plant design features that may factor into this analysis such as the barriers that must be breached to release such fission products. Site characteristics must also be part of the evaluation. The applicant must perform an evaluation and analysis and provide that information in its application to allow the staff to independently evaluate the technical bases of the analyses, assumptions, and assessment leading to its conclusions. Although the application included limited site- and design-specific information with results of the analyses, the applicant did not provide the safety assessment containing an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1)(ii)(D).

With a complete COLA application, rather than one provided in two parts, the staff would expect this information to be provided in FSAR Chapter 15, “Accident and Transient Analysis.” In the absence of a complete FSAR, the staff expects that some of the information listed in RG 1.206 Section C.I.15 should be included in the application and addressed to a sufficient level of detail. For example, RG 1.206 Section C.I.15.6.5, “Radiological Consequences,” describes that the applicant should summarize the assumptions, parameters, and calculational methods used to determine the doses that result from accidents. Provide sufficient information to allow an independent analysis to be performed. Include all pertinent plant parameters that are required to calculate doses for the EAB [exclusion area boundary] and LPZ [low population zone], as well as those locations within the EAB where significant site-related activities may occur (e.g., the control room). While some of this information is not necessary to support the requirements of 10 CFR 50.34(a)(1)(ii)(D), some of it is necessary for example to provide sufficient detail for the staff to evaluate and perform an independent analysis of dose consequences at the EAB and

LPZ.

The applicant did not provide the evaluation nor has it provided an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.34(a)(1)(ii)(D).

Information required by 10 CFR 50.30(f)

8. ENVIRONMENTAL REPORT (ER), Chapter 7, “Environmental Impact of Postulated Accidents Involving Radioactive Materials”

To assist in determining how information submitted in this area may or may not address the requirements of 10 CFR 50.30(f) regarding impacts of accidents, the staff uses insights from NUREG-1555, “Standard Review Plans for Environmental Reviews for Nuclear Power Plants,” Sections 7.1, 7.2, and 7.3. The industry has expressed interest in using NUREG-1555, rather than the RG 4.2, that is cited in RG 1.206, “Combined License Applications for Nuclear Power Plants,” because NUREG-1555 aligns more closely with current practices. NUREG-1555 indicates that at least some in-depth design-and site-specific design-basis accident analysis and probabilistic risk assessment information is vital to the review of ER Sections 7.1, 7.2, and 7.3. Portions of these sections for a COL application overlap with the environmental analysis that is conducted in the evaluation of standardized designs.

The information that is needed to consider design-basis accidents (Section 7.1) should include description and analysis that reflects the radiological consequences that might result from a postulated accident involving release of fission products specific to the site. The information for this environmental analysis is comparable to the information needed for the site safety analysis described in FSAR Chapter 15 as characterized in the discussion immediately above. With respect to the impacts of severe accidents (Section 7.2), the application provides information unrelated to the reactor design being contemplated for Calvert Cliffs Nuclear Power Plant, Unit 3 and relies on a qualitative correlation and comparison rather than a site-specific severe accident impact analysis. With respect to severe accident mitigation alternatives (Section 7.3), the applicant did not provide an analysis; UniStar does provide a brief discussion asserting that the risk from its bounding analysis is so low that there would be no cost-effective severe accident mitigation design alternatives; additionally, there was no discussion of severe accident mitigation alternatives related to procedure development and training.

The information in these sections is not based on the plant-specific risk assessments that are expected to be available when the U.S. EPR design certification application is tendered; furthermore, if the approach to certify the U.S. EPR design is consistent with earlier design certification applications, then the assessment is likely to rely upon assumptions regarding site parameters rather than the site characteristics of a particular location. Consequently, the information in Sections 7.1, 7.2, and 7.3, do not provide the design- and site-specific information nor did the applicant propose an acceptable alternative. Therefore, the staff cannot evaluate how this information may or may not meet the requirements of 10 CFR 50.30(f) regarding impacts of accidents.

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