October 22, 2012

Mr. Kiyoshi Okamura
Vice President
Nuclear Energy Systems & Services Division
Toshiba Corporation Power Systems Company
1-1, Shibaura 1-Chome, Minato-ku
Tokyo 105-80001, Japan

SUBJECT: TOSHIBA CORPORATION – UNITED STATES ADVANCED BOILING-WATER REACTOR DESIGN CERTIFICATION RENEWAL APPLICATION

Dear Mr. Okamura:

In a letter dated October 27, 2010, you submitted a Design Certification (DC) Renewal application for the U.S. Advanced Boiling-Water Reactor (ABWR) pursuant to the requirements of Subpart B, "Standard Design Certifications," of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." On January 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff met with Toshiba staff to discuss your renewal application as well as Draft NRC Views on Application Content and Draft Staff Review Guidelines (Agencywide Documents Access and Management System Accession No. ML103140050). On June 21, 2012, you submitted Revision 1 of the DC Renewal application for the U.S. ABWR. The staff has reviewed Revision 1 and believes certain design changes should be considered for inclusion in your application.

The NRC has completed its compilation of design changes that the agency considers to be regulatory improvements or changes that could meet the 10 CFR 52.59(b) criteria. The design changes are identified in the enclosure to this letter. The Commission also has directed the staff to implement the Fukushima Near-Term Task Force recommendations contained in SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami" dated February 17, 2012. Therefore, Toshiba is requested to address the Fukushima Recommendations 4.2, 7.1 and 9.3 as described in the enclosure to this letter.

The NRC requests that you identify the design changes that you intend to incorporate in your renewal application and that you provide a schedule for submitting your revised application within 60 days of the date of this letter.

Should you have any questions or comments concerning this matter, please contact David Misenhimer at (301) 415-6590, or via e-mail at David.Misenhimer@nrc.gov.

Sincerely,

***/RA Frank Akstulewicz for/***

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

Docket No.: 52-044

Enclosure:
As stated

cc w/encl: See next page

Should you have any questions or comments concerning this matter, please contact David Misenhimer at (301) 415-6590, or via e-mail at David.Misenhimer@nrc.gov.

Sincerely,

***/RA Frank Akstulewicz for/***

David B. Matthews, Director
Division of New Reactor Licensing
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Enclosure:
As stated

cc w/encl: See next page

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**ADAMS Accession No.**: ML12215A460 *via e-mail NRO-002

| **OFFICE** | PM:DNRL/LB3 | LA:DNRL/LB3 | BC:DNRL/LB3 | OGC | D:NRO/DSEA |
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| **NAME** | DMisenhimer | SGreen* | RJenkins | MSpencer | SFlanders (CLauron for)* |
| **DATE** | 08/07/2012 | 08/03/2012 | 10/19/2012 | 10/18/2012 | 09/21/2012 |
| **OFFICE** | D:NRO/DSRA | D:NRO/DE | D:NRO/DCIP | D:NSIR/DPR | D:NRO/DNRL |
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| **DATE** | 09/21/2012 | 09/18/2012 | 09/06/2012 | 08/20/2012 | 10/22/2012 |

**OFFICIAL RECORD COPY**

**Advanced Boiling Water Reactor Design Certification Renewal**
**Design Changes For Toshiba's Consideration**

| Item No. | Description |
|---|---|
| 1 | Specify dynamic bearing capacity and differential settlement site parameters determined by design requirements and/or model analysis to ensure foundation and structural stability. |
| 2 | Include hurricane winds and missiles as site parameters and how the appropriate SSCs are protected from these winds and missiles. |
| 3 | Address the significance of design basis maximum groundwater level in the hydrology section and its allowable margin if any, identify where this parameter is used, and if possible, set the design basis maximum groundwater level at site grade. |
| 4 | Include 10 CFR 20.1406 design features to minimize contamination and the generation of reactor waste. |
| 5 | Include the Condensate Storage Tank (CST) as a radioactive source, describe how it complies with the requirements of 10 CFR 20.1406, and describe access control requirements for the CST to ensure that doses from the CST are maintained as low as reasonably achievable and do not exceed 10 CFR Part 20 limits **or** include a COL item for COL applicants to provide the information described above. |
| 6 | Correct data in the source term tables (Tables 12.2-3b and 12.2-3c), provide calculation supporting any additional changes, and verify that there are not additional errors in the ABWR DCD as a result of the table errors. |
| 7 | Confirm that the Off-Gas System (OGS) components housed in the non-safety related Turbine Building (TB) structure meet the design criteria per Regulatory Guide (RG) 1.143. |
| 8 | Confirm that the emergency core cooling system suction strainer design complies with 10 CFR 50.46(b)(5), including providing NPSH margins using RG 1.82, Revision 4, addressing chemical, in-vessel, and ex-vessel downstream effects, providing a structural analysis, and updating the ITAAC as necessary consistent with the new guidance. |
| 9 | Address three major review areas from ISG-019: identification of potential gas accumulation locations and intrusion mechanisms, addition of ITAAC to confirm identification and prevention measures, and development of procedures for surveillance and venting. |
| 10 | Add a COL item to develop operating procedures to respond to prolonged low-level reactor coolant leakage below technical specification limits. |
| 11 | Add a commitment to ASME NOG-1 as an acceptable approach to meeting NUREG-0554 criteria for the design of overhead heavy load handling system cranes. |

Enclosure

| | |
|---|---|
| 12 | Seismic/Structural Analysis:<br><br>(a) Provide analysis of reactor core combined seismic and LOCA loading to demonstrate conformance to the structural acceptance requirements described in Appendix A of SRP Section 4.2 (DCD Tier-2, 4.2.3.1.2 (1))<br><br>(b) Provide structural, dynamic and impact analysis of new and spent fuel racks (DCD Tier-2, 9.1.6.2 and 9.1.6.7) |
| 13 | Provide thermal-hydraulic analysis that evaluates the rate of naturally circulated flow and the maximum rack water exit temperatures (DCD Tier-2, 9.1.6.8). |
| 14 | Provide criticality analyses of new and spent fuel storage racks (DCD Tier-2, Sections 9.1.1.3.1 and 9.1.2.3.1). |
| 15 | The Toshiba ABWR DC Renewal Application, Revision 1, indicates conformance to some of the recent instrumentation and control (I&C) related regulations, industry standards, and regulatory guidance. Noting that the industry standards and NRC staff guidance on I&C are undergoing frequent updates to address new issues or to incorporate lessons learned, the design should conform to the latest guidance on I&C such as SRP BTP 7-19 Revision 6. |
| 16 | Provide Design/Analysis for Diesel Generator (DG) Fuel Oil Transfer System tunnel structures for routing the fuel oil transfer piping and cable systems from fuel oil storage tank to DGs located in the reactor building. |
| 17 | Apply the guidance from Regulatory Issue Summary 2008-05, Revision 1, to the existing ITAAC and submit revised ITAAC. |
| 18 | Provide a control room design that reflects state-of-the-art human factor principles in accordance with 10 CFR 50.34(f)(2)(iii). |
| 19 | Address the design related aspects of Fukushima Recommendation 4.2 regarding mitigation strategies for beyond-design-basis external events as outlined in Attachment 2 of the Order issued on March 12, 2012 (ML12054A735). |
| 20 | Address the design related aspects of Fukushima Recommendation 7.1 regarding enhanced spent fuel pool instrumentation as outlined in Attachment 2 of the Order issued on March 12, 2012 (ML12054A679). |
| 21 | Include a COL item for Fukushima Recommendation 9.3 regarding emergency preparedness as outlined in the Request for Information pursuant to 10 CFR 50.54(f) dated March 12, 2012 (ML12053A340). |
| 22 | Provide Toshiba's Quality Assurance Program Description (QAPD) for approval by NRC per requirements of 10 CFR 52.47(a)(19). Toshiba references their QAPD in Section 17.1 of the DCD. |

DC Toshiba Mailing List (Revised 09/26/2012)
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