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10 CFR 50.4
10 CFR 52.79

March 2, 2009

UN#09-112

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Response to Request for Additional Information for
Calvert Cliffs Nuclear Power Plant, Unit 3,
RAI No. 29 Questions 03.05.01.03-1 and 03.05.01.03-2, Turbine Missiles

Reference: 1) John Rycyna (NRC) to Rob Poche (UniStar), "RAI No. 29 CIB1 1542.doc"
email dated January 29, 2009

The purpose of this letter is to respond to the request for additional information (RAI) identified in the NRC e-mail correspondence to UniStar Nuclear, dated January 29, 2009 (reference above). This RAI addresses Turbine Missiles, as discussed in Section 3.5 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the CCNPP Unit 3 Combined License Application (COLA), Revision 3.

Enclosure 1 provides our response to RAI No. 29, Questions 03.05.01.03-1 and 03.05.01.03-2; which includes revised FSAR wording. A Licensing Basis Document Change Request has been initiated to incorporate this change into a future revision of the FSAR. There are no new regulatory commitments in this correspondence.

Enclosure 2 contains an affidavit attesting to the proprietary nature of the Missile Turbine Analysis shown in Enclosure 3. Enclosure 3 is the PROPRIETARY Missile Turbine Analysis completed by ALSTOM.

D079
NRO

If there are any questions regarding this transmittal, please contact me at (410)-470-4205, or Mr. Michael J. Yox at (410) 495-2436.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 2, 2009

A handwritten signature in black ink, appearing to read 'Greg Gibson', with a long horizontal line extending to the right.

Greg Gibson

- Enclosures:
- 1) Response to NRC Request for Additional Information, RAI No. 29, Questions 03.05.01.03-1 and 03.05.01.03-2, Turbine Missiles, Calvert Cliffs Nuclear Power Plant, Unit 3
 - 2) Affidavit Attesting to Proprietary Nature of the ALSTOM Turbine Missile Analysis
 - 3) ALSTOM Turbine Missile Analysis

cc: John Rycyna, NRC Project Manager, U.S. EPR COL Application
Thomas Fredrichs, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Joseph Colaccino, Chief, EPR Projects Branch, Division of New Reactor Licensing
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

Enclosure 1

**Response to NRC Request for Additional Information, RAI No. 29
Questions 03.05.01.03-1 and 03.05.01.03-2**

Turbine Missiles

Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 29

Question 03.05.01.03-1

COL information item 3.5-2 in the U.S. EPR Rev. 0, FSAR, Tier 2, Ch. 1, Table 1.8-2 states that the COL applicant will confirm the evaluation of the probability of turbine missile generation for the selected turbine generator, P1, is less than 1×10^{-4} for turbine-generators favorably oriented with respect to containment. Section 3.5.1.3 of the Calvert Cliffs COL FSAR states that a turbine missile analysis has been developed for the selected turbine design, and includes charts on missile generation probabilities of turbine rotor failure versus service time for the high pressure/intermediate pressure and low pressure turbine rotors consistent with the guidance in RG 1.115. It should be noted that Section 10.0 of the Calvert Cliffs COL FSAR states that the turbine generator is an Alstom design. Section 10.2 states that it meets the requirements of Section 10.2 of the U.S. EPR FSAR. To determine whether the turbine missile generation probability is less than 1×10^{-4} , which establishes the inspection interval of the turbine rotors, the staff requests that the applicant provide the turbine missile generation probability analysis to the staff for review.

Response

A Turbine Missile Analysis (proprietary) completed by ALSTOM that concludes the required inspection frequency to meet the NRC probability limit is 18.1 years for the low-pressure (LP) rotor and 21.3 years for the high intermediate pressure (HIP) rotor. The analysis also estimated the probability of a turbine missile event assuming a 10 year inspection cycle (see response to 03.05.01.03-2, below) is 1×10^{-06} and 0.9×10^{-07} for the LP and HIP, respectively.

The detailed analysis is presented in Enclosure 3 of this response. The analysis is deemed proprietary in accordance with 10 CFR 2.390 (a) (4) – *Trade Secrets*.

FSAR Impact:

There are no impacts to the COLA FSAR.

RAI No. 29

Question 03.05.01.03-2

Section 3.5.1.3 of the Calvert Cliffs COL FSAR states that the turbine rotor inspection program is described in the U.S. EPR FSAR, Section 10.2, and is consistent with the turbine manufacturer's recommended inspection intervals required to meet the calculated failure probability of the turbine rotor. In response to staff's RAIs, AREVA stated that U.S. EPR FSAR, Tier 2 Section 10.2.3.6 will be changed to perform inservice inspections consistent with the inspection intervals from the turbine manufacturer's turbine missile analysis provided by the COL applicant. A COL applicant that references the U.S. EPR FSAR will provide a site-specific turbine rotor inservice inspection interval consistent with the turbine manufacturer's turbine missile analysis. Therefore, the NRC staff requests that the corresponding turbine inspection program description, including the inspection interval that follows the guidance of SRP Sections 3.5.1.3 and 10.2.3 be submitted to the staff for review in order to meet the requirements of GDC 4, "Environmental and Dynamic Effects Design Bases" of 10 CFR Part 50, Appendix A.

Response

AREVA's response to NRC RAI 18,¹ Question 03.05.01.03-1, revised the US EPR FSAR Section 10.2.3.6 as shown below:

10.2.3.6 Turbine Rotor Inservice Inspection Program Plan

A turbine rotor inservice inspection program detects rotor or disk flaws that can lead to brittle failure at or below design speed in the steam turbine rotor assembly. The turbine rotor inservice inspection program uses visual, surface and volumetric examinations to inspect components in the steam turbine rotor assembly. The inspections are performed during refueling outages on an interval consistent with the inservice inspection schedules in the Reference 3 so that a total inspection has been completed at least once within a 10 year time period and the inspection intervals from the turbine manufacturer's turbine missile analysis provided by the COL applicant as described in Section 3.5.1.3. A COL applicant that references the U.S. EPR design certification will provide the site-specific turbine rotor inservice inspection interval consistent with the manufacturer's turbine missile analysis.

The new COL item added to the U.S. EPR FSAR requires the COL applicant to identify the inspection interval. The description of the turbine rotor inspection program is already contained within the U.S. EPR FSAR Section 10.2.3.6 in subsequent paragraphs which follow the text cited above. This description is consistent with the recommendations included in the turbine manufacturer's missile analysis provided in response to RAI 03.05.01.03-1. The turbine manufacturer recommends major rotor inspection intervals of 10 years. These inspections are performed during refueling outages on an interval consistent with the inservice inspection schedules in ASME Section XI so that a total inspection has been completed at least once within a 10 year time period.

¹ Response to U.S. EPR Design Certification Application RAI No. 18, FSAR Ch 3 and 5. (ML082240667 dated 2008-07-23)

FSAR Impact:

Section 10.2.3.6 of the COL FSAR will be revised as follows after US EPR FSAR Section 10.2.3.6 has been revised to incorporate RAI 18, Question 03.05.01.03-1:

10.2.3.6 Turbine Rotor Inservice Inspection Program Plan

~~No departures or supplements.~~

The U.S. EPR FSAR includes the following COL Item in Section 10.2.3.6:

A COL applicant that references the U.S. EPR design certification will provide the site-specific turbine rotor inservice inspection interval consistent with the manufacturer's turbine missile analysis.

This COL Item is addressed as follows:

The turbine manufacturer recommends major rotor inspection intervals of 10 years, during major overhauls. The inspections are performed during refueling outages on an interval consistent with the inservice inspection schedules in ASME Section XI so that a total inspection has been completed at least once within a 10 year time period.

Enclosure 2

**Affidavit Attesting to Proprietary Nature of the
ALSTOM Turbine Missile Analysis**

AFFIDAVIT

COMMONWEALTH OF VIRGINIA)

) ss.

CITY OF RICHMOND)

1. My name is Stephen Reinstein. I am the Legal Counsel for the Power Systems Turbomachines Group of Alstom Power Inc. ("Alstom") and, as such, I am authorized to execute this Affidavit.
2. I am familiar with the criteria applied by Alstom to determine whether certain Alstom information is proprietary. I am familiar with the policies established by Alstom to ensure the proper application of these criteria.
3. I am familiar with Alstom information contained in all the documentation associated with the Alstom Turbine Missile Analysis Report and referred to herein as "Documentation." Information contained in this Documentation has been classified by Alstom as proprietary in accordance with the policies established by Alstom for the control and protection of proprietary and confidential information.
4. This Documentation contains information of a proprietary and confidential nature and is the type customarily held in confidence by Alstom and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Documentation as proprietary and confidential.



5. This Documentation has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in the Documentation be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is requested qualified under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information."
6. The following criteria are customarily applied by Alstom to determine whether information should be classified as proprietary:
 - (a) The information reveals details of Alstom's research and development plans and programs or their results.
 - (b) The availability or use of any such confidential design information to or by a competitor of Alstom would provide such competitor with a substantial improvement in the ability to make competitive proposals that reflect knowledge of Alstom design effectiveness that is not otherwise available to the market. This competitive knowledge would allow such competitor to propose equipment performance with a greater than otherwise possible knowledge of Alstom's expected proposals, thereby improving the competitor's probability of selection and contract award.
 - (c) The information includes test data or analytical techniques concerning a process, methodology, component, or the detailed test results conducted on turbine equipment supplied by Alstom, which would provide to a knowledgeable reader, insights into the effectiveness of individual elements of Alstom's designs, as well as in depth knowledge of the actual

performance of the complete equipment package, the application of which results in a competitive advantage for Alstom.

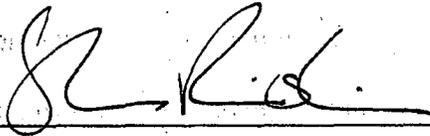
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for Alstom in product optimization or marketability. The use by a competitor of such information would be to the detriment of Alstom through the loss of contract awards, future sales and future profits. All such information is of great value to Alstom in its continuous design improvement process to meet the requirements of a competitive marketplace.
- (e) The information is vital to a competitive advantage held by Alstom, would be helpful to competitors to Alstom, and would likely cause substantial and irreparable harm to the competitive position of Alstom. The information is of the type of information that Alstom zealously pursues and defends as confidential business information through the use of highly restrictive confidentiality agreements that are not time limited in their applicability.

The information in the Documentation is considered proprietary for the reasons set forth in paragraphs 6(b), 6(c), 6(d) and 6(e) above.

- 7. In accordance with Alstom's policies governing the protection and control of information, proprietary information contained in this Documentation has been made available, on a limited basis, to others outside of Alstom only as required

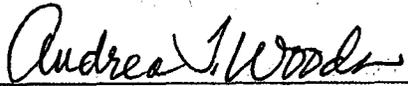
and under stringent agreements providing for nondisclosure and limited use of the information.

8. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

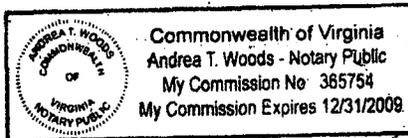


Stephen Reinstein, Legal Counsel

Subscribed before me this 13th
day of February, 2009.



Andrea Woods
Notary Public
My Commission Expires December 31, 2009
Commission No. 365754



Enclosure 3

ALSTOM Turbine Missile Analysis

**The contents of this Enclosure are withheld in
accordance with 10 CFR 2.390 (a)(4).**