June 16, 2008
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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Response to U.S. EPR Design Certification Application RAI No. 7, Question 19-73

Ref. 1: E-mail, Getachew Tesfaye (NRC) to Ronda Pederson, et al (AREVA NP Inc.), "U.S. EPR Design Certification Application RAI No. 7," May 16, 2008.

In Reference 1, the NRC provided a request for additional information (RAI) regarding the U.S. EPR design certification application. A technically correct and complete response to Question 19-73 of the RAI is enclosed with this letter.

AREVA NP considers some of the material contained in the attachments to this letter to be proprietary. As required by 10 CFR 2.390(b), an affidavit is enclosed to support the withholding of the information from public disclosure. Proprietary and non-proprietary versions of the enclosure to this letter are provided.

The provided response meets NRC's stated expectation and supports the established review schedule for the U.S. EPR design certification application.

Sincerely,

Sandra M. Sloan

Sandra M. Sloan, Manager
New Plants Deployment Regulatory Affairs
AREVA NP Inc.

Enclosures

cc: J. Rycyna
G. Tesfaye
Docket No. 52-020

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NRO

AFFIDAVIT

STATE OF VIRGINIA)
) ss.
COUNTY OF CAMPBELL)

1. My name is Ronda M. Pederson. I am Licensing Manager, Regulatory Affairs for New Plants Deployment, for AREVA NP Inc. and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by AREVA NP to determine whether certain AREVA NP information is proprietary. I am familiar with the policies established by AREVA NP to ensure the proper application of these criteria.

3. I am familiar with the AREVA NP information contained in the enclosed document, "U.S. EPR Design Certification Application RAI No. 7, Question 19-73," dated June 16, 2008 and referred to herein as "Document." Information contained in this Document has been classified by AREVA NP as proprietary in accordance with the policies established by AREVA NP for the control and protection of proprietary and confidential information.

4. This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by AREVA NP 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 Document as proprietary and confidential.

5. This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document 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 qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information".

6. The following criteria are customarily applied by AREVA NP to determine whether information should be classified as proprietary:

(a) The information reveals details of AREVA NP's research and development plans and programs or their results.

(b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.

(c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA NP.

(d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA NP in product optimization or marketability.

(e) The information is vital to a competitive advantage held by AREVA NP, would be helpful to competitors to AREVA NP, and would likely cause substantial harm to the competitive position of AREVA NP.

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

7. In accordance with AREVA NP's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside AREVA NP only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. AREVA NP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

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

SUBSCRIBED before me this 16th

day of June, 2008.

Kathleen A. Bennett
NOTARY PUBLIC, STATE OF VIRGINIA
MY COMMISSION EXPIRES: 8/31/2011

KATHLEEN ANN BENNETT
Notary Public
Commonwealth of Virginia
110844
My Commission Expires Aug 31, 2011

Response to

Request for Additional Information No. 7, Revision 0
5/16/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section: 19
SPLA Branch

Question 19-73:

(Follow-up to Question 19-04) Please provide additional information on the failure rates used for TELEPERM XS (TXS) components. How do the failure rates compare to both observed field experience and theoretical (e.g., part stress) estimates? How do the failure rates account for possible adverse environmental conditions (e.g., high temperature) in accident scenarios?

Response to Question 19-73:

Table 19-73-1 shows failure rates for some key TXS components. The table shows a comparison of theoretical and field failure rates. The field experience is from TXS components in similar applications, such RPS and ESFAS systems in European nuclear power plants. The field experience includes both best estimates (number of failures divided by accumulated operating time) and upper confidence values calculated with a chi-squared distribution and 95% confidence interval.

The table also shows theoretical failure rates, calculated for a reference condition of 28 °C. The theoretical failure rates are more conservative than the 95% chi-squared values by a factor that varies between about 1X and 10X; generally the more accumulated operating hours for the component, the more the field data departs from (improves upon) the theoretical calculation.

The TXS equipment is qualified for environmental, seismic, electromagnetic interference and radio frequency interference (EMI/RFI) conditions in accordance with the environmental qualification program described in FSAR Sections 3.11 and 7.0.

Environmental conditions are accounted for in the theoretical failure rates. The manufacturer's failure data for TXS components includes theoretical failure rates calculated for applications in 28 °C (82 °F) and 40 °C (104 °F) normal ambient environments. (The 40 °C failure rates are about a factor of two worse than the 28 °C failure rates shown in the table.) In addition, the manufacturer authorizes use of the TXS components at temperatures up to 45 °C (113 °F) for unlimited time periods, and has tested them for limited periods of time up to 50 °C (122 °F).

According to the manufacturer, the 28 °C failure rates are appropriate for TXS systems that are operated in air-conditioned areas. The TXS components used in the protection system (PS) are in the safeguards buildings, which are air conditioned. Adverse accident environments that could affect the system are: HVAC failure and Safeguard Building fire. These events are modeled explicitly to disable electrical equipment and I&C components located in the affected Safeguards Building. Therefore the 28 °C failure rates are applicable to the PS PRA model.

The theoretical failure rate calculations are intended to be conservative and are appropriate for use in the early design phase. Since the detailed design of the instrumentation and control (I&C) systems is not complete, it was decided that the more conservative theoretical values of the failure rates would be used in the PRA model. The failure rates may be updated to the actual field data (95% values) at a later time.

Table 19-73-1—Example TXS Failure Rate Comparison

TXS Component	Accumulated Operating Time (module-years)	Observed Failure Rate (/hr)	Upper Confidence Failure Rate (/hr)	Theoretical Failure Rate (/hr)
Communication Module	[ ]	[ ]	[ ]	[ ]
Processing Module	[ ]	[ ]	[ ]	[ ]
Digital Input Module	[ ]	[ ]	[ ]	[ ]
Digital Output Module	[ ]	[ ]	[ ]	[ ]
Analog Input Module	[ ]	[ ]	[ ]	[ ]

FSAR Impact:

The FSAR will not be changed as a result of this question.

[ ]