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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 the Calvert Cliffs Nuclear Power Plant, Unit 3,
RAI No. 138, Special Topics for Mechanical Components

Reference: John Rycyna (NRC) to Robert Poche (UniStar Nuclear Energy), "RAI No 138 EMB1 2315.doc" email dated August 13, 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 Energy, dated August 13, 2009 (Reference). This RAI addresses Special Topics for Mechanical Components, as discussed in Section 3.9 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Combined License Application (COLA), Revision 5.

The enclosure provides our response to RAI No. 138, Question 03.09.01-1, and includes revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA. Our response to Question 03.09.01-1 does not include any new regulatory commitments.

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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 September 14, 2009

for Greg Gibson

Enclosure: Response to NRC Request for Additional Information RAI No. 138, Question 03.09.01-1, Special Topics for Mechanical Components, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
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

GTG/JMR/mdf

Enclosure

Response to NRC Request for Additional Information RAI No. 138, Question 03.09.01-1, Special Topics for Mechanical Components, Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 138

Question 03.09.01-1

The U.S. EPR DC FSAR Tier 2 Section 3.9.1.2 includes a COL Item stating that the pipe stress and support analysis will be performed by a COL applicant that references the U.S. EPR design certification. Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 FSAR Section 3.9.1.2 states that the applicant will use a piping analysis program based on the computer codes described in U.S. EPR FSAR Section 3.9.1 and U.S. EPR FSAR Appendix 3C. Provide a list of computer codes, including the versions and dates, to be used for design and construction of CCNPP Unit 3 piping and supports. Identify computer codes not listed in the U.S. EPR FSAR that will be used for CCNPP Unit 3.

Response

1. A list of computer codes, including the versions and dates, to be used for the design and construction of CCNPP Unit 3 piping and supports are provided in Table 1.

Table 1- Computer Codes Used for the Design and Construction of CCNPP3 Piping and Supports

Computer Code	Owner	Version	Date
ANSYS	ANSYS Inc.	V11	2007
SUPERPIPE	AREVA Inc.	24	Apr-09
BWSPAN	AREVA Inc.	V11.0	Apr-09
CRAFT2	AREVA Inc.	V31.0HP	Sep-92
BWHIST	AREVA Inc.	V3.0HP	Dec-94
P91232	AREVA Inc.	3.0/PC	Feb-01
RESPECT	AREVA Inc	16	Jan-96
GT STRUDL	Georgia Tech Research Corp.	28	Jan-05
ROLAST	AREVA Inc	08.01E	Jan-08
S-TRAC	AREVA Inc.	1	2002
FAPPS	BECHTEL	19	Jul-02
BASEPLATE	BECHTEL	16	Sep-01
MAPPS	BECHTEL	11	Sep-01
HSTA	BECHTEL	5.1	Apr-06
CE099	BECHTEL	4	May-06

2. Computer codes not listed in the U.S. EPR FSAR Section 3.9.1 or Appendix 3C that will be used for the design and construction for CCNPP Unit 3 piping and supports are identified in Table 2.

Table 2- Computer Codes Not Listed in the U.S. EPR FSAR Section 3.9.1, or Appendix 3C That Will Be Used for the Design and Construction of CCNPP3 Piping and Supports

Computer Code	Owner	Version	Date
ROLAST	AREVA Inc	08.01E	Jan-08
S-TRAC	AREVA Inc.	1	2002
FAPPS	BECHTEL	19	Jul-02
BASEPLATE	BECHTEL	16	Sep-01
MAPPS	BECHTEL	11	Sep-01
HSTA	BECHTEL	5.1	Apr-06
CE099	BECHTEL	4	May-06

COLA Impact

The CCNPP Unit 3 COLA FSAR Section 3.9.1.2 will be revised as shown below:

3.9.1.2 Computer Programs Used in Analyses

The U.S. EPR FSAR includes the following COL Holder Items in Section 3.9.1.2:

> Pipe stress and support analysis will be performed by a COL applicant that references the U.S. EPR design certification.
>
> A COL applicant that references the U.S. EPR design certification will either use a piping analysis program based on the computer codes described in Section 3.9.1 and Appendix 3C or will implement an NRC-approved benchmark program using models specifically selected for the U.S. EPR.

These COL Holder Items are addressed as follows:

{Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC} shall perform the required pipe stress and support analysis and shall utilize a piping analysis program based on the computer codes described in U.S. EPR FSAR Section 3.9.1 and U.S. EPR FSAR Appendix 3C. {In addition, CCNPP Unit 3 will utilize the piping analysis programs supplemented as follows:

- FAPPS

FAPPS (Frame Analysis Program for Pipe Supports) is an interactive computer program specifically developed for the analysis and design of standard frames (easy input) as well as any non-standard frame for pipe support. It optimizes member sizes, welds, base plates and embedments based upon various user specified design parameters. The process of optimization of member sizes is controlled by the user to achieve an economical solution.

The FAPPS program has the flexibility to perform normal load condition code checks for the American Institute of Steel Construction (AISC) code. FAPPS allows use of various types of load sets for simplification of input, to allow algebraic, absolute and/or square root sum of the squares combination of results due to each load vector within a load set, as well as each load set that is to be combined in one load set.

- BASEPLATE

BASEPLATE (Design/Analysis of Baseplate for Pipe Supports) is intended for design and/or analyzing the baseplate of pipe supports. BASEPLATE is a combination of pre-processor and finite element solver, with the capability of analyzing flexible baseplates on a geometrically non-linear foundation. The pre-processor performs geometry calculations to generate the finite element model and datasets for the solver. The solver performs analysis execution, post-processing, and plots. Post-processing reformats the results into report tables and plots containing the undeformed geometry configuration.

- MAPPS

MAPPS (Miscellaneous Application For Pipe Supports) is an interactive program that enables the user to access any or all of the following pipe support analysis computer programs within one run: uniform weld, non-uniform weld, beta angle, clip angle, bolt spacing, anchor plate, local effects, pipe clamps, and loading transformation.

- HSTA

HSTA (Hydraulic System Transient Analysis) is a computer program that can be used to analyze the transient liquid flow phenomena in complex piping systems generally encountered in nuclear power plants. The code primarily calculates fluid pressure and velocity changes with time. These variables can then be used to calculate the piping forces that serve as the dynamic forcing functions used as input for pipe stress work. This program can also model liquid column separation and filling/draining of lines. The calculation scheme is based on the method of characteristics.

The piping system to be analyzed is modeled as a system of links, each link being composed of several nodes. A variety of boundary devices such as reservoirs, valves, pumps, etc., can be modeled in the code. These devices can either connect two or more links or lead to the exterior of the network.

- CE099

The CE099 (Transient Analysis in Liquid Systems) computer program calculates unsteady flow conditions in closed conduit liquid networks. The method of characteristics as applied to the one dimensional unsteady flow equations is utilized to compute the time variable pressure and flows throughout the network. Hydraulic devices typically encountered in piping networks such as pumps, valves, surge tanks, and other pipeline components are included in the model. It is required for work on cooling water systems, water supply pipelines, petrochemical plant systems, LNG systems, airport fuel loading systems, hydropower systems, and mining water and tailings pipelines.

- ROLAST

ROLAST is a one-dimensional best-estimate computer code that performs calculations of dynamic hydraulic loads for piping systems undergoing fast transients including water hammer phenomena. This AREVA NP developed code is used for single-phase flow. It can model behaviors of components such as pumps, valves, damped and undamped check valves, vessels with various boundary and initial conditions. Typical code applications include operating and accidental fluid transient events in piping network systems such as check valve slam, rapid valve closure, pump start and stop, and pipe breaks. The code has been benchmarked to test facility data and plant data from existing nuclear power plants. Agreement between ROLAST calculations and test/measurement data has been obtained.

- S-TRAC

S-TRAC is an AREVA NP developed computer code based on the NRC Transient Reactor Analysis Code (TRAC Version-P) with hydraulic load calculations package added. TRAC-P is a thermal hydraulic analysis tool to calculate the transient reactor behavior of pressurized water reactors. S-TRAC features one-, two- or three-dimensional treatment of the pressure vessel and its associated internals, a two-phase fluid non-equilibrium hydrodynamics model with a non-condensable gas field, and solute tracking and a flow-regime-dependent constitutive-equation treatment. S-TRAC is used for two-phase fluid transients and multidimensional regions. Examples of code application include fluid transient loads in the reactor pressure vessel, steam generator (e.g. shroud, sparger, dryer, U-tubes), and the pressurizer relief piping system. The verification and validation of S-TRAC is based on the validation examples made for TRAC-P. Additionally, the code has been benchmarked to test facility data and plant data from existing nuclear power plants. Agreement between S-TRAC calculations and test/measurement data has been obtained.}