

**Response to**

**Request for Additional Information No. 15, Revision 0**

**6/13/2008**

**U. S. EPR Standard Design Certification**

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 04.05.01 - Control Rod Drive Structural Materials**

**Application Section: 4.5.1**

**CIB1 Branch**

**Question 04.05.01-1:**

FSAR Section 4.5.1 indicates that the components of the Control Rod Drive Mechanism that are not part of the Reactor Coolant Pressure Boundary are primarily fabricated from materials meeting Deutsches Institut für Normung E.V. (DIN) specifications. Table 4.5-1 lists the CRDM components and provides the material numbers but does not provide the DIN specification number. Given that there is no history regarding the use of materials meeting the DIN specifications in the current operating US fleet, the staff requests that the applicant provide the DIN specifications and a comparison of the listed European material specifications to ASME Code material specifications and grades. These comparisons should address differences between DIN and ASME specifications in chemistry, processing, final metallurgical condition, mechanical properties and design allowable stresses. In addition, the staff requests that the applicant modify Table 4.5-1 to include the DIN specifications and comparable ASME Code, Section II specifications and grades.

**Response to Question 04.05.01-1:**

A response to this question will be provided by August 22, 2008.

**Question 04.05.01-2:**

The FSAR identifies that the latch unit compression springs and drive rod compression springs (non-Reactor Coolant Pressure Boundary components) are fabricated from W.Nr. 2.4669 (Alloy X-750). The FSAR indicates that this alloy will be supplied in the solution annealed (followed by quenching) and thermally aged condition for optimum resistance to stress corrosion cracking. In order for the staff to evaluate the acceptability of the applicant's thermal treatment (which is needed to achieve optimal stress-corrosion-cracking resistance), the staff requests that the applicant discuss its solution-annealing and thermal-aging requirements and provide a description of any testing that has been performed to demonstrate the effectiveness of thermal treatments in optimizing the material's resistance to stress-corrosion cracking.

**Response to Question 04.05.01-2:**

A response to this question will be provided by October 30, 2008.

**Question 04.05.01-3:**

FSAR Section 4.5.1 indicates that latch unit magnetic parts and some drive rod components are fabricated from W. Nr. 1.4006 (Type 410 martensitic stainless steel). The applicant states that this material is delivered in a quenched and tempered condition. The tempering temperature is greater than 1112°F, but Section 4.5.1 does not list a maximum tempering temperature. In order for the staff to evaluate the acceptability of the applicant's intended tempering temperature for martensitic stainless steels used in the Control Rod Drive Mechanism structural components, the staff requests the applicant specify its tempering-temperature range as well as the tempering time and provide the bases for the temperature range and tempering time selected. In addition, the staff requests that the applicant modify FSAR Section 4.5.1 to include the tempering temperature range.

**Response to Question 04.05.01-3:**

A response to this question will be provided by August 22, 2008.

**Question 04.05.01-4:**

FSAR Section 4.5.1 indicates that latch-unit pins and the drive-rod spreader button are fabricated from WNr. 2.4967. The applicant also indicated that this material is comparable to Haynes 25 (UNS R30605). The staff was unable to locate a material WNr. 2.4967 that is comparable to Haynes 25. However, the staff identified WNr. 2.4964 which is comparable to Haynes 25 and is a Co-Ni-Cr-W alloy. The applicant stated that this material is delivered in the solution-annealed condition. In order for the staff to complete its review of the use of Haynes 25, the staff requests the following information be addressed. Provide a clarification regarding the listing of WNr. 2.4967 in lieu of WNr. 2.4964 which is similar to Haynes 25, and discuss any corrosion and mechanical testing that has been performed to verify that this material is acceptable for its intended use.

**Response to Question 04.05.01-4:**

A response to this question will be provided by October 30, 2008.

**Question 04.05.01-5:**

FSAR Section 4.5.1 indicates that the materials used to fabricate the Control Rod Drive Mechanism are selected based on a proven German design with 30 years of operating experience. The staff requests that the applicant verify that all of the materials listed in Table 4.5-1 have significant (i.e., 30 years) operating experience in Pressurized Water Reactors and describe the extent to which evidence of general corrosion, stress-corrosion cracking or other forms of degradation were discovered in operating foreign nuclear plant applications.

**Response to Question 04.05.01-5:**

A response to this question will be provided by October 30, 2008.