## ArevaEPRDCPEm Resource

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**Subject:** Draft - U.S. EPR Design Certification Application RAI No. 159 (1765), FSAR Ch. 9
**Attachments:** Draft RAI_159_SBPA_1765.doc

Attached please find draft RAI No. 159 regarding your application for standard design certification of the U.S. EPR. If you have any question or need clarifications regarding this RAI, please let me know as soon as possible, I will have our technical Staff available to discuss them with you.

Please also review the RAI to ensure that we have not inadvertently included proprietary information. If there are any proprietary information, please let me know within the next ten days. If I do not hear from you within the next ten days, I will assume there are none and will make the draft RAI publicly available.

Thanks,
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Request for Additional Information No. 159 (1765), Revision 0

12/16/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.05.05 - Emergency Diesel Engine Cooling Water System
Application Section: 9.5.5

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

09.05.05-1

General Design Criteria (GDC) 2 requires that safety-related portions of the diesel generator cooling water system (DGCWS) to be protected from natural phenomena, including earthquakes. FSAR Tier 2, Section 9.5.5.1 states that the safety-related portions of the DGCWS remain functional after a safe shutdown earthquake (SSE). FSAR Tier 2, Figure 9.5.5-1 shows the pre-heat system as non seismic (NSC). FSAR Tier 2, Section 3.2.1.5 defines NSC components as not subject to any seismic design criteria invoked by the applicable commercial or industrial codes and standards, and not falling within the RG 1.29 criteria for classification as Seismic Category I or II. The FSAR does not state that structural failure of the pre-heat system during a seismic event will not impact Seismic Class I equipment or cause functional failure of Seismic Class I equipment. In view of the foregoing, provide:

a) Justification for the conclusion that the possible failure of the preheat portion of the system during a seismic event will not adversely affect the seismic category I and safety-related portions of the DGCWS and cause the DGCWS to lose fluid and system pressure.

b) Justification for the preheat structures, systems and components (SSC) of the system not being classified as seismic class II.

Revise the FSAR accordingly to clarify compliance with the above stated requirements and guidelines.

09.05.05-2

Regulatory Guide 1.29, “Seismic Design Classification,” states that those portions of structures, systems, and components (SSCs), including the auxiliary systems for the onsite electric power supplies, of which continued function is not required but of which failure could reduce the functioning of the Class 1E electrical systems, to an unacceptable safety level, should be designed and constructed so that the safe shutdown earthquake (SSE) would not cause such failure.

Although the applicant stated that the safety related portion of the DGCWS remains functional after an SSE, the application is not clear about the effects of the failure of nearby non seismic SSC. The applicant did not state that the non seismic category I

SSCs in surrounding SSCs will either have no effect on the safety related functions of the DGCWS after an SSE or are designed to withstand SSE seismic loads, without incurring a structural failure that could reduce the safety related functions of the DGCWS.

Explain the effects of non seismic category I SSCs in nearby non seismic category I SSCs upon the safety related SSCs in the DGCWS during an SSE. The FSAR should be changed to reflect this information.

09.05.05-3

The applicant did not provide in FSAR Tier 2, Section 9.5.5, "Diesel Generator Cooling Water System," a justification for the conclusion that with four DGSAS in two emergency power generation building (EPGB), an internal generated missile could not adversely affect more than one DGSAS. Additionally, the applicant stated that there are no high energy lines in the EBGB; however, the applicant did not state that the DGCWS are protected from moderate energy line breaks. Since the applicant did not state that an internal missile could not damage more that one DGCWS, and the applicant did not state that each DGCWS could withstand the effects of any moderate energy line break in the area, the applicant did not demonstrate that the application meets the requirements of GDC 4.

a) Justify not stating in the FSAR Tier 2, Section 9.5.5 that an internally generated missile will not disable more that one DGCWS.
b) Provide the effects of a moderate line break upon the DGCWS.

The FSAR should be changed to reflect this information.

09.05.05-4

SRP Section 9.5.5 lists the guidelines for the applicant to meet the requirements of GDC 17, which include the recommendations of NUREG/CR 0660, "Enhancement of On-Site Emergency Diesel Generator Reliability." In order to avoid excessive vibration on the instruments, controls and sensors, NUREG/CR 0660 recommends that instruments, control and monitoring or indicating elements be supported in or on a free standing, directly mounted, panel to the extent functionally practical except for the necessary sensors in piping, etc. The applicant has not stated that control and instrumentation devices mentioned above in the emergency diesel generators (EDG), including the DGCWS are mounted as such. Therefore, the staff could not ascertain whether the applicant met all the recommendations of NUREG/CR 0660 and thus all the guidelines of SRP Section 9.5.5, which meets the requirements of GDC-17. Provide the design description for implementing the recommendations from NUREG/CR 0660 regarding the mounting of controls, instruments and sensors in the EDGs for the EPR.

The FSAR should be changed to reflect this information.

09.05.05-5

SRP Section 9.5.5, "Emergency Diesel Engine Cooling Water System," Revision 3, specifies that the design include the capability to detect and control system leakage, including isolating system portions in the event of excessive leakage or component

malfunction. Describe the system design capability for detecting and mitigating system leakage, including isolating system portions in the event of excessive leakage or component malfunction

The FSAR should be changed to reflect this information.

09.05.05-6

SRP Section 14.3, “Inspection, Tests, Analyses, and Acceptance Criteria,” specify that Tier 1 information should include a certified design description and figures. FSAR Tier 1, Section 2.5.4, “Emergency Diesel Generator,” describes some certified design material and ITAAC for the EDG, but does not include any certified design material and ITAAC for the safety related and seismic category I SSCs of the DGCWS, such as valves, pipe, pumps, heat exchangers, instrumentation and alarms. FSAR Tier 1 Section 2.5.4 does not have a figure showing the functional arrangement of the significant SSCs of the DGCWS. There is no ITAAC for the DGCWS to verify:

1) The DGCWS is installed in accordance with the design;

2) The DGCWS will operate in accordance with the design, i.e. DGCWS operating pressure, temperature differentials, flow rate and heat removal rate are in accordance with the engine manufacturer’s recommendations and thus ensure reliable DGCWS operation.

3) The DGCWS can accept full EDG load at the maximum design temperature of the heat sink, i.e. essential service water system.

Provide the add certified design information and ITAAC for the safety related SSCs and safety related functions of the DGCWS, including a figure showing functional arrangement of significant SSCs per the requirements of 10 CFR 52.47(b) (1) and the guidelines of SRP Section 14.3.