Draft

Request for Additional Information No. 94 (913, 1185), Revision 0

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U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 03.03.01 - Wind Loading
SRP Section: 03.05.02 - Structures Systems and Components To Be Protected From Externally-Generated Missiles
Application Section: FSAR Ch. 3

QUESTIONS for SEB2 and SBPB Branches

03.03.01-1

(a) Provide the basis for the wind load design of other structures covered in the Areva FSAR. If the wind loading for other structures is less than that used for Seismic Category I Structures, address the impact and consequences of the failure of these other structures on Seismic Category I Structures.

(b) In Section 3.3.1.2.1, "Notes on Values Used", a comparison is made between the coefficient values used for the determination of the velocity pressure, q_z, between those used in SRP 3.3.1 (Wind Loading) and those used in FSAR Section 3.3.1.2 (Determination of Applied Wind Forces). Specifically, in the FSAR, the lower limit for K_z is given as .85, K_d is given as .85 or greater, and K_{zt} is given as 1.2, while in the SRP the lower limit for K_z is given as .87, K_d is given as 1.0 or greater, and K_{dt} is 1.0. A comparison of the product of these values at a height of z less than 15 feet shows the Areva value lower by .04%. Above this height, the Areva velocity pressure should exceed the SRP value due to the fact that the topographic coefficient, K_{zt}, is higher than the SRP value. However, in ASCE 7-05 (Minimum Design Loads for Buildings and Other Structures), if the value of K_d is taken from Table 6-4, then Section 6.5.4.4 of that Standard requires that the K_d value must be used in conjunction with the load combinations of Section 2.3 and 2.4. Has this requirement been reflected in the load combinations for Seismic Category I structures and other structures designed for wind load?

(c) The vent stack is a tall cylindrical structure and such structures can fail under wind load due to vortex shedding. Confirm if vortex shedding was considered in design. If yes, discuss the applied analytical methodology and related wind parameters used. If not, justify the basis of preclusion in the design and provide the analysis results for the consequences of a vent stack failure on safety-related structures.

03.05.02-1

(a) GDC 2 requires in part that SSCs important to safety shall be appropriately designed to withstand the effects of external missiles generated from natural phenomenon. Each of the essential service water buildings (ESWB) houses an essential service water cooling tower (ESWCT) and an essential service water pump building (ESWPB). In FSAR Tier 1 Section

2.1.5 Paragraph 4.3, AREVA stated that the ESWB are designed to withstand the effects of earthquakes, tornadoes, floods, tornado-generated missiles, however, FSAR Tier 2 Figures 3.8-101 and 3.8-102 show:

- the ESWCT open at elevation 29.3 m (96 ft) with the fan below potentially susceptible to a missile impact. Provide discussion/analysis in the FSAR to demonstrate that the ESWCT is capable of withstanding a vertical impact from a tornado-generated missile.

- equipment hatches at elevation 19.2 m (63 ft) on the ESWPB roof deck, which are potentially susceptible to vertical impacts from tornado-generated missiles. Provide discussion/analysis in the FSAR to demonstrate that the ESWPB roof deck is capable of withstanding a vertical impact from a tornado generated missile

(b) GDC 4 requires in part that SSCs important to safety shall be appropriately protected against the effects of missiles that may result from events and conditions outside the nuclear power unit. A missile induced failure of a nonsafety-related SSC could prevent a safety-related SSC from completing its safety function. FSAR Tier 2 Section 3.5.2 stated that Section 3.3.2.3 evaluates the evaluation of the effects of failures of structures or components not designed for tornado loads, including missile impact, could have on nearby safety-related structures. However, Section 3.3.2.3 does not discuss the effects of missile impact. Provide discussion/analysis in the FSAR to determine whether missile induced failure of nonsafety-related SSCs could prevent a safety-related SSC identified as requiring protection from externally generated missiles from completing its safety function.