Response to

Request for Additional Information No. 37,Supplement 1, Revision 0

8/07/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 02.03.01 - Regional Climatology
SRP Section: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases
SRP Section: 02.03.05 - Long-Term Atmospheric Dispersion Estimates for Routine Releases
Application Section: FSAR Ch. 2
RSAC Branch

Question 02.03.01-10:

The response to RAI 02.03.01-7 noted that inherent to the definition of zero percent exceedance temperature is to exclude peaks of less than two hours in duration. In spite of the two hour criterion, the staff still believes that the proposed zero percent maximum non-coincident wet bulb temperature of 81ºF is under-conservative. As shown in attachment 1, compared to maximum observed wet bulb temperatures from ASHRAE, the U.S. EPR proposed site parameter is exceeded throughout the majority of the U.S., 67 percent of the time, especially in the Southeast U.S., where the proposed site parameter is exceeded 96 percent of the time. The NRC staff is not inclined to approve a plant design that cannot be sited at a reasonable number of potential COL sites without requiring COL applicants to request a departure from the design as part of their COL application. Please revise the zero percent maximum non-coincident wet bulb temperature or provide additional justification how this value is representative of a reasonable number of sites.

Response to Question 02.03.01-10:

As stated in the response to RAI No. 10, Question 02.03.01-7 (Reference 1), the zero percent, non-coincident wet bulb temperature value of 81°F was used solely as the design point for the ultimate heat sink (UHS) cooling towers. While this design point was used in the sizing of the cooling towers, the cooling tower design was validated to a bounding time dependent wet bulb temperature profile to determine the minimum cooling characteristics of the UHS. This information is provided in U.S. EPR FSAR Tier 2, Table 2.1-4. The validation determined that the cooling tower design met the UHS design requirements (i.e., essential service water supply temperature) under a time dependent heat load for the limiting design basis event.

While the 81°F zero percent exceedance, non-coincident wet bulb design point may be exceeded at locations throughout the U.S., the cooling tower design can be validated to site-specific time dependent wet bulb temperature profiles at the time of minimum UHS cooling such that no departure from the U.S. EPR design would be required. The U.S. EPR UHS design was evaluated using site specific meteorological data for each of the combined license applications (COLA) referencing the U.S. EPR design. It was verified that the site-specific data yield acceptable maximum UHS basin temperatures. Therefore, the design of the UHS cooling towers is representative of the COLA sites referencing the U.S. EPR design.

References for Question 02.03.01-10:

1. E-mail, Ronda M. Pederson (AREVA NP) to Getachew Tesfaye (NRC), et al., "Response to U.S. EPR Design Certification Application RAI No. 10 Re: FSAR Ch 2," July 2, 2008.

FSAR Impact:

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

Question 02.03.01-11:

The response to RAI 02.03.01-8 is inadequate since it only discusses the zero percent exceedance maximum wet bulb temperature of 81º F. Please provide a technical basis for the site parameter values listed in FSAR Table 2.1-3 and FSAR Table 2.1-4. Also, please justify that these site parameter values are representative of a number of potential COL sites.

Response to Question 02.03.01-11:

Refer to the response to RAI No. 37, Supplement 1, Question 02.03.01-10 for the basis for the parameters listed in U.S. EPR FSAR Tier 2, Table 2.1-4 and the justification that these values are representative for the combined license application (COLA) sites referencing the U.S. EPR design. The ultimate heat sink (UHS) cooling tower basins are sized based on zero percent exceedance coincident wet bulb and dry bulb temperatures such that no makeup to the basin is required for three days following the initiation of a design basis accident (DBA) under the worst case environmental conditions. Similar to the minimum UHS cooling evaluation, the cooling tower design itself was validated for maximum evaporation and drift losses with a bounding time dependent wet bulb and dry bulb temperature profile under a time dependent heat load for the limiting design basis event. This time dependent wet bulb and dry bulb temperature profile is provided in U.S. EPR FSAR Tier 2, Table 2.1-3.

As noted in the response to RAI No. 37, Supplement 1, Question 02.03.01-10, the UHS cooling tower design has been evaluated and determined to be bounding for the four COLA sites referencing the U.S. EPR design. Specifically, the UHS cooling tower basin was sized based on a zero-percent exceedance, coincident wet bulb and dry bulb temperature of 80°F and 115°F, respectively, for 72 hours following a design basis accident. Evaluations using site-specific data determined that the sizing of the U.S. EPR UHS cooling tower basins bounds the four COLA that reference the U.S. EPR design. Therefore, no exemptions or departures were required regarding the UHS design.

FSAR Impact:

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