

## ClinchRiverESPSafRAIPEm Resource

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**From:** Sutton, Mallecia  
**Sent:** Friday, August 25, 2017 10:12 AM  
**To:** Schiele, Raymond Joseph  
**Cc:** Colaccino, Joseph; Fetter, Allen; Mazaika, Michael; Harvey, Brad; Cook, Christopher; Quinlan, Kevin; pshastings (pshastings@tva.gov); ClinchRiverESPSafRAIPEm Resource  
**Subject:** Issuance of RAI Pertaining Section 02.03.03 - Onsite Meteorological Measurements Programs of TVA application  
**Attachments:** CRNS ESP Final RMOT-09 RAI 8972.pdf

Good Morning,

This email is a formal issuance of an RAI to Section 02.03.03 - Onsite Meteorological Measurements Programs, (RAI Number-09, eRAI-8972), for the Clinch River Nuclear Site ESP application review. The draft version of the RAI was provided to TVA on 8/04/2017, and a clarification call on the draft RAI was not requested by TVA.

The schedule we have established for the review of the application assumes technically correct and complete responses within 30 calendar days of receipt of RAIs. For any RAIs that cannot be responded to within 30 calendar days, it is expected that a date for receipt of this information will be provided to the staff within the 30-day period so that the staff can assess how this information might impact the published schedule.

Please contact me if you have any questions.

Thanks,

Mallecia Sutton  
U.S. Nuclear Regulatory Commission  
Office of New Reactors  
Division of New Reactor Licensing  
Licensing Branch 3  
Washington, D.C.  
301-415-0673

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**Received Date:** 8/25/2017 10:11:44 AM  
**From:** Sutton, Mallecia

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**Options**

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**Request for Additional Information, Number 09, eRAI 8972**

Issue Date: 08/25/2017

Application Title: Clinch River Nuclear Site, ESP

Operating Company: Tennessee Valley Authority

Docket No. 52-047

Review Section: 02.03.03 - Onsite Meteorological Measurements Programs

Application Section: Onsite Meteorological Measurements Programs

QUESTIONS

02.03.03

Regulatory Background

10 CFR 100.21(c) requires that site atmospheric dispersion characteristics be evaluated and dispersion parameters established such that (1) radiological effluent release limits associated with normal operation from the type of facility to be located at the site can be met for any individual located offsite; and (2) radiological dose consequences of postulated accidents shall meet the criteria set forth in 10 CFR 50.34(a)(1) for the type of facility proposed to be located at the site. Regulatory Guide (RG) 1.23, Revision 1 provides guidance for the siting of meteorological instruments so that recorded data can provide measurements representative of the atmospheric conditions into which material will be released and transported.

RAI Question: 02.03.03-1

SSAR Section 2.3.3.2, "Primary Meteorological Facility," provides a description of the primary meteorological system used to collect onsite meteorological data in support of the CRNS ESP application.

The staff could not find a sufficient description of the tower design, mounting, and exposure of the meteorological instrumentation to confirm if RG 1.23 was followed with respect to the following guidance:

- Measurements should be recorded on an open-latticed tower or mast.
- Wind sensors should be located on top of the measurement tower or mast or extended outward on a boom to reduce airflow modification and turbulence induced by the supporting structure itself. Because the tower structure can affect downwind measurements, wind sensors on the side of a tower should be mounted at a distance equal to at least twice the longest horizontal dimension of the tower (e.g., the side of a triangular tower). The sensors should be on the upwind side of the mounting object in areas with a dominant prevailing wind direction. In areas with two distinct prevailing

wind directions (e.g., mountain valleys), the sensors should be mounted in a direction perpendicular to the primary two directions.

- Ambient temperature and atmospheric moisture measurements should be made to avoid air modification by heat and moisture sources (e.g., ventilation sources, cooling towers, water bodies, large parking lots). The aspirated temperature shields should either be pointed downward or laterally towards the north and the shield inlet should be at least 1½ times the tower horizontal width away from the nearest point on the tower.

Please update the SSAR to provide sufficient information to confirm that the following meteorological monitoring system attributes meet the guidance provided in RG 1.23.

- a) Type of tower.
- b) Mounting of the wind sensors.
- c) Mounting of the temperature and humidity sensors.

02.03.03

### Regulatory Background

10 CFR 52.17(a)(1)(ix) states, in part, that an Early Site Permit (ESP) application shall include: “[a] description and safety assessment of the site on which a facility is to be located”, that “[t]he assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in paragraphs (a)(1)(ix)(A) and (a)(1)(ix)(B) of this section”, that “[t]he applicant shall perform an evaluation and analysis of the postulated fission product release...including site meteorology, to evaluate offsite radiological consequences”, and that “[s]ite characteristics must comply with part 100 of this chapter”.

With respect to 10 CFR Part 100, paragraph 100.20(c)(2) states that the “[m]eteorological characteristics of the site that are necessary for safety analysis or that may have an impact upon plant design...must be identified and characterized”. Further, 10 CFR 100.21(c) states that “[s]ite atmospheric dispersion characteristics must be evaluated and dispersion parameters established such that: (1) [r]adiological effluent release limits associated with normal operation...can be met for any individual located offsite; and (2) [r]adiological dose consequences of postulated accidents shall meet the criteria set forth in [section] 50.34(a)(1) of this chapter”.

To that end, NUREG-0800, Standard Review Plan (SRP) Section 2.3.3, Onsite Meteorological Measurements Program, establishes criteria that the NRC staff uses to evaluate whether an applicant meets the NRC's regulations. SRP Section 2.3.3, Subsection III (Review Procedures), Item (1)(e), Data Acquisition and Reduction, indicates that there are many methods of acquiring data from meteorological measurement systems which are acceptable to the staff and that among

the basic components, reviewed by the NRC Staff to ascertain the acceptability of meteorological data acquisition and reduction, is the averaging time of system outputs for final disposition and accuracy of these data.

RAI Question: 02.03.03-2

In SSAR Subsection 2.3.3.2.4, “Data Recording and Display”, the applicant provided a description of the data acquisition system for the primary meteorological monitoring system, including data processing output. With respect to the processing of wind measurements, the description indicates that “15-minute and hourly average wind speed and vector wind speed” are calculated, and that “15-minute and hourly vector wind direction and horizontal wind direction sigma” values were generated.

The NRC staff notes that the discussions in SSAR Sections 2.3.3, 2.3.4 (Short-Term Accident Diffusion Estimates), or 2.3.5 (Long-Term (Routine) Diffusion Estimates) do not indicate whether various data summaries included in the SSAR or as part of the meteorological input to the accident- and routine release-related dispersion modeling analyses were based on vector-averaged wind direction data, as might reasonably be inferred from the list of meteorological output listed in SSAR Subsection 2.3.3.2.4. The staff further notes that the dispersion modeling results could be markedly different depending on whether a scalar average (i.e., based on a unit vector wind direction) or a true vector average (i.e., based on the magnitude of the wind speeds and the actual orientations of the wind direction over the averaging interval) were used.

Consequently, the applicant should update SSAR Subsection 2.3.3.2.4 (and any other related sections or subsections directly or by cross-reference, as appropriate) to indicate and provide justification for which type of wind direction and/or wind speed data (i.e., scalar and/or vector average) were used to generate the following summaries and model input data:

- a) the wind roses presented in SSAR Figures 2.3.2-3 through 2.3.2-28;
- b) the joint frequency distributions presented in SSAR Tables 2.3.4-2 through 2.3.4-8;
- c) the sequential hourly meteorological data provided to the NRC staff via DVD (received 6/10/2016);
- d) the joint frequency distributions provided as input to the PAVAN and XOQDOQ atmospheric dispersion models (in SSAR Subsections 2.3.4.2 and 2.3.5.2, respectively); and
- e) the sequential hourly meteorological data provided as input to the CALPUFF atmospheric dispersion model (in SSAR Subsection 2.3.5.3).