

**From:** [Carolyn Lauron](#)  
**To:** ["Justin Hawkins"](#)  
**Cc:** [Greg Cranston](#); [Jordan Glisan](#); [Michael Dudek](#); ["Andrew Brenner"](#)  
**Subject:** NRC Staff Response to SMR (Holtec) Question re: Wet Bulb Temperature  
**Date:** Tuesday, January 24, 2023 2:50:00 PM

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Hi Justin –

Please find the NRC staff response to the subject question below.  
Please let us know if you need additional information.

Thanks,  
Carolyn

### **Background and Question:**

In reading SRP 2.3.1, Regional Climatology, we are confused by the use of ‘non-coincident wet bulb temperature’:<sup>[1]</sup>

SRP 2.3.1 - I.6.e: “Ambient temperature and humidity statistics (e.g., 2% and 1% annual exceedance and 100-year maximum dry bulb temperature and coincident wet bulb temperature; 2% and 1% annual exceedance and 100-year maximum wet bulb temperature (non-coincident); 98% and 99% annual exceedance and 100-year minimum dry bulb temperature) for use in establishing heat loads for the design of normal plant heat sink systems, post-accident containment heat removal systems, and plant heating, ventilating, and air conditioning systems.”

In an October 12, 2011, presentation to the commission, the NRC staff defined ‘non-coincident wet bulb temperature’ as “*recorded wet-bulb-temperature, regardless of dry-bulb temperature.*”

Our staff is unclear how or why ‘non-coincident wet bulb temperature’ is used. To us, wet bulb is a measuring technique and is usually done in parallel with dry bulb to be able to measure relative humidity. A wet bulb temperature on its own seem useless.

**Can the staff clarify HOW and WHY ‘non-coincident wet bulb temperature’ is used?**

### **NRC Staff Response:**

For applications following the guidance in Chapter 2 of NUREG-0800, the NRC staff reviews the meteorology related site characteristics that could affect the safe design and siting of the plant.<sup>[2]</sup> The NRC meteorological staff verifies that the values listed for these characteristics are appropriate for the site based on historical data, and many of the values are used by other NRC staff in the review of other parts of the application. This applies to

the non-coincident wet bulb temperature.

With respect to how and why 'non-coincident wet bulb temperature' is used, it is part of the ambient temperature and humidity statistics used in establishing heat loads for the design of normal plant heat sink systems, post-accident containment heat removal systems, and plant heating, ventilating, and air conditioning systems.

**References:**

1. US NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 2, "Site Characteristics and Site Parameters," Section 2.3.1, "Regional Climatology," Revision 3, March 2007. (ML063600393)
2. US NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 2, "Site Characteristics and Site Parameters."