

## **NRR-PMDAPEm Resource**

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**From:** Dietrich, Allison  
**Sent:** Thursday, December 17, 2015 1:36 PM  
**To:** hlkish@aep.com  
**Cc:** Terry L Curtiss (tlcurtiss@aep.com); Erwin, Kenneth; Shoop, Undine; Pelton, David; White, Jason; Grenier, Bernard  
**Subject:** D.C. COOK UNITS 1 AND 2 - MET RAI CONCERNING LAR TO ADOPT TSTF-490 AND IMPLEMENT FULL SCOPE AST (MF5184 MF5185)  
**Attachments:** MET RAI regarding Alternate Source Term MF5184 MF5185\_final.pdf

By letter dated November 14, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14324A209), as supplemented by letter dated February 12, 2015 (ADAMS Accession No. ML15050A247), Indiana Michigan Power Company (I&M) submitted a license amendment request for the Donald C. Cook Nuclear Plant, Units 1 and 2. The proposed amendment consists of adoption of Technical Specifications Task Force (TSTF)-490, Revision 0, and implementation of a full scope alternate source term radiological analysis methodology.

The U.S. Nuclear Regulatory Commission (NRC) staff in the Meteorology and Oceanography Team of the Hydrology and Meteorology Branch has reviewed your submittal, as supplemented. The staff has determined that additional information is needed in order to complete the review, as described in the attached Request for Additional Information (RAI). The draft RAI was sent to I&M via electronic mail on October 21, 2015 and November 10, 2015. Clarification telephone conferences were held on November 4, 2015 and December 15, 2015. Based on our discussions, we understand that a response will be provided by February 19, 2016.

Please let me know if you have any questions or concerns.

Sincerely,

Allison W. Dietrich, Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation  
301-415-2846

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**From:** Dietrich, Allison

**Created By:** Allison.Dietrich@nrc.gov

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REQUEST FOR ADDITIONAL INFORMATION REGARDING  
ADOPTION OF TSTF-490, REVISION 0  
AND IMPLEMENTATION OF FULL-SCOPE ALTERNATE SOURCE TERM  
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-315 AND 50-316  
CAC NOS. MF5184 AND MF5185

RAI-MET-1

The Donald C. Cook Nuclear Plant (CNP) Alternate Source Term (AST) Radiological Analyses Technical Report was provided as Enclosure 9 to the license amendment request (LAR) dated November 14, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14324A209). Section 2.3.3, "Meteorological Data," of Enclosure 9, states that meteorological data were collected from a primary, backup, and shoreline tower. The LAR states that data from the shoreline tower most accurately represents the meteorological conditions on site based on its vicinity to CNP. However, the shoreline tower only records data at a height of 10 meters (m). As a result, a hybrid meteorological data set is created using the 10 m data from the shoreline tower for the lower level measurements, and the 60 m data from the primary tower for the upper level measurements. The stability classes are calculated based on the temperature difference between the 10 m and 60 m levels on the primary tower. The years of data provided are based on the 5 most recent years that have valid data for both the primary and shoreline towers. Five years' worth of meteorological data is used, which meets the guidance set forth in Regulatory Position 3.1 of Regulatory Guide 1.194 (ADAMS Accession No. ML031530505).

The LAR does not state the distance between the towers. Moreover, in the absence of the 60 m level data from the shoreline tower, it is not clear what data were used, if any, to replace the bad or missing data from the primary tower for the upper level measurements, or whether there were sufficient good data from the shoreline tower to meet the >90% recovery criterion.

- a) Indicate the locations of weather towers and their distances from CNP.
- b) Indicate the sources of data, if any, which were used to replace the bad or missing data for the 60 m level.

RAI-MET-2

Section 2.3.3, "Meteorological Data," of Enclosure 9 of the LAR, states that meteorological data from a 5-year data set (2002, 2004, 2005, 2007, and 2010) were selected, since they were the 5 most recent years with full periods of high quality data available. The meteorological data was converted from the raw format into the proper formatting required to create the meteorological data files for use with ARCON96 and PAVAN.

The 2004 data in the Excel spreadsheet provided shows that for the time period from 1/1/2004 at 00:00 until 1/3/2004 at 01:00 (i.e., longer than 2 days), all data were bad, both at the primary and shoreline towers, and possibly at the backup tower. Although 55 bad data points out of 8,786 hourly data points is only 0.63 percent of the data collected in 2004, the probability of such bad data occurring simultaneously at two stations at the same time is extremely low unless there is a common cause failure.

The data for the year 2004 was manipulated within a spreadsheet for use with ARCON96 and PAVAN, but nothing is mentioned about the source of any data that replaced bad or missing data.

There are no hours in the .MET data files that were provided for ARCON96 input that indicate calm wind speeds. There are many hours in the .MET data files (284 in lower, 142 in upper) that have wind speeds that exceed the maximum wind speed classification used in the PAVAN input file.

- a) Explain the reason for the missing or bad data for the first 48 hours in the 2004 Excel file.
- b) Since the LAR states that 2004 is one of the years in which data were available for the full period (i.e., the whole year), please explain which data, if any, were used to substitute for these 2 days, and the method, if any, that was used to extrapolate these data.
- c) Explain how this period was represented in the joint frequency distribution (JFD) for PAVAN.
- d) Explain the missing calm wind speed data and the excessive high wind speed data in the supplied .MET files.

RAI-MET-3

The JFD table was synthesized from hourly readings of wind speed, wind direction and atmospheric stability collected at the shoreline and primary towers. Wind speed was segmented into 14 ranges from 0 to 14 meters per second (m/s). Although it was clear that wind speeds of less than 0.22 m/s were treated as calm, and went into the first wind-speed bin, it was not clear from the LAR how wind speeds greater than 14 m/s were treated.

Although high wind speeds are not usually associated with high relative air concentration (X/Q), all assumptions about how the JFD table was created should be clearly stated.

- a) State whether data for wind speeds greater than 14 m/s were discarded, or became part of the JFD table.

#### RAI-MET-4

Although all of the .MET data that the licensee used was supplied to the NRC staff, not all of the ARCON96 results were replicated. In the LAR, Enclosure 9, Table 2.3-3, there are results for 16 different ARCON96 input datasets. Of the 16, the staff was able to replicate the results for 14 of them. The only parts of the input data that were changed were the exclusion area boundary (EAB) and low population zone (LPZ) boundary data, per Table 2.3-4.

The two release points that were not replicated have the word “diffuse” in the descriptions. Some other portion of the input data was changed that is not reflected in the five columns of input data numbers that are provided for the 16 input datasets in Table 2.3-2. Also, there are blanks in scenario O of Table 2.3-3. The ARCON96 output for this case did provide results for the blank columns appearing in this row.

- a) Explain the reasoning behind leaving the blanks in scenario O of Table 2.3-3.
- b) Provide the .RSF input data file for the case represented by scenarios M and N, and at least one other case (e.g. scenario D).
- c) Explain the assumptions made to approximate the diffuse sources in scenarios M and N of Table 2.3-3.

#### RAI-MET-5

The atmospheric dispersion calculations completed for this LAR are based on data collected from both the primary meteorological tower, located approximately one mile east of CNP, and the shoreline meteorological tower, located slightly northwest of CNP on the Lake Michigan shoreline. The licensee uses wind speed and direction from the 10 m location of the shoreline tower, but relies on temperature measurements at the 10 and 60 m levels of the primary tower for defining atmospheric stability. The licensee states that data from the shoreline tower are more representative of the plant for wind speed and direction. For on-shore winds, which are the main direction of concern for impact to the control room (CR), EAB and LPZ, it appears that there is a considerable difference in wind speed, direction, and temperature measurements from the 10 m level of the two towers. Therefore, the use of wind speed and direction from the shoreline tower, and atmospheric stability from the primary tower, may not be accurate or conservative. This could especially be true for a site where sharp contrasts in surface friction and air/water temperature can exist that could lead to the development of a coastal Thermal Internal Boundary Layer.

- a) Justify the use of combined meteorological data from the two towers in the atmospheric dispersion calculations. This justification should particularly address the validity of combining data for off-site dose evaluations. If it is shown that X/Q at the CR, EAB and LPZ could be higher for some scenarios using only primary tower data for the atmospheric dispersion calculations, justify why the use of the shoreline tower is acceptable. Alternatively, develop another data set for dispersion calculations.