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NUCLEAR ENERGY

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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Response to Request for Additional Information for the
Calvert Cliffs Nuclear Power Plant, Unit 3,
RAI No. 196, Onsite Meteorological Measurement Program

References: Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "Final RAI 196 RSAC 3785.doc," email dated January 4, 2010

The purpose of this letter is to respond to the request for additional information (RAI) identified in the NRC e-mail correspondence to UniStar Nuclear Energy, dated January 4, 2010. This RAI addresses the Onsite Meteorological Measurement Program, as discussed in Section 2.3.3 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Combined License Application (COLA), Revision 6.

The enclosure provides our response to RAI No. 196, Question 02.03.03-9 and includes revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA.

Our response does not include any new regulatory commitments. This letter does not contain any sensitive or proprietary information.

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NRO

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 470-6317.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 1, 2010

Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI No. 196, Onsite Meteorological Measurement Program, Question 02.03.03-9, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

GTG/VWH/mdf

UN#10-024

Enclosure

**Response to NRC Request for Additional Information,
RAI No. 196, Onsite Meteorological Measurement Program, Question 02.03.03-9,
Calvert Cliffs Nuclear Power Plant, Unit 3**

RAI No 196

Question 02.03.03-9

The staff's guidance in NUREG-0800, Section II, Acceptance Criteria, under SRP Acceptance Criteria, item 3, states that the applicant should identify and justify any deviations from the guidance provided in Regulatory Guide (RG) 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants." The guidance in RG 1.23 contains criteria the staff considers acceptable for the collection of basic meteorological data needed to support plant licensing and operation pursuant to NRC regulations in 10 CFR Part 50, paragraphs 50.47(b)(4), 50.47(b)(8) and 50.47(b)(9), Section IV.E.2 of Appendix E, 10 CFR Part 20, 10 CFR Part 100(c)(2) and other rules.

In FSAR sections 2.3.3.1.7 and 2.3.3.2.7, the applicant describes deviations from RG 1.23. Section 2.3.3.1.7, which pertains to the pre-operational meteorological measurement program, describes three deviations: No atmospheric moisture measurements, as described in RG 1.23, Regulatory Position C.2.5; the tower will not be at plant grade, as described in RG 1.23, Regulatory Position C.3.; and tower, guyed wires and anchors will be inspected every 5 years, instead of annual guyed wires and every 3 year inspection of anchors and tower, as described in RG 1.23, Regulatory Position C.5. However, Section 2.3.3.2.7, which pertains to the operational meteorological measurement program, states that the only deviation from RG 1.23 will be that the tower will not be at plant grade.

The NRC staff requests that the applicant clarify whether there are additional deviations from the guidance in RG 1.23 that will apply during either the pre-operational or the operational meteorological measurement program, such as:

- The guidance regarding atmospheric moisture measurements in Regulatory Position C.2.5 for sites using cooling towers;
- The guidance regarding inspections in Regulatory Position C.5;
- The guidance regarding the use of wind shields on precipitation gauges to minimize the wind-caused loss of precipitation; or
- The guidance on digital sampling of data every 5 seconds. A digital sampling rate of every 10 seconds was specified in the applicant's reply to RAI Question 02.03.03-3.

As stated in NUREG-0800, Section II, Acceptance Criteria, under SRP Acceptance Criteria, item 3, the staff requests that the applicant update the FSAR to remove the discrepancy in the pre-operational meteorological measurement program deviations between FSAR sections 2.3.3.1.7 and 2.3.3.2.7, and include justification for each deviation from the guidance provided in Regulatory Guide 1.23.

Response

CCNPP Unit 3 will use the meteorological tower currently in use by CCNPP Units 1 and 2. Deviations from regulatory guidance provided in Regulatory Guide 1.23, Meteorological Monitoring Programs for Nuclear Power Plants, for the pre-operational program include:

- No atmospheric moisture measurements, as described in RG 1.23, Regulatory Position C.2.5;

- The tower is not sited at plant grade, as described in Regulatory Guide 1.23, Regulatory Position C.3;
- No wind shield installed on the precipitation gauge, as described in Regulatory Guide 1.23, Regulatory Position C.3;
- Guyed wires and anchors are inspected every 5 years, instead of an annual inspection of guyed wires and an inspection of anchors every 3 years, as described in Regulatory Guide 1.23, Regulatory Position C.5; and
- A digital data sampling rate of 10 seconds is used instead of 5 seconds, as described in Regulatory Guide 1.23, Regulatory Position C.6.

During the operational program, atmospheric moisture measurements are not required. The guyed wire and anchor inspections will be performed in accordance with Regulatory Guide 1.23, Revision 1, as part of the CCNPP Unit 3 operational program. Although the use of a wind shield on the precipitation gauge is not specified in Safety Guide 23, one was installed in 2009. Therefore, the precipitation gauge meets the requirements of Regulatory Guide 1.23, Revision 1. However, since the wind shield was recently installed and data was taken without the wind shield in place, it will remain listed as a deviation during the preoperational phase. The following remaining items will remain deviations from Regulatory Guide 1.23, Revision 1 during the CCNPP Unit 3 operational program:

- The tower is not sited at plant grade, as described in Regulatory Guide 1.23, Regulatory Position C.3;
- A digital data sampling rate of 10 seconds will be used instead of 5 seconds, as described in Regulatory Guide 1.23, Regulatory Position C.6.

CCNPP Unit 3 will use the same meteorological tower that is currently in use by CCNPP Units 1 and 2. CCNPP Units 1 and 2 replaced their meteorological monitoring instrumentation in December 2005. The specifications of the instrumentation meet or exceed the accuracy and resolution requirements of Regulatory Guide 1.23, Revision 1. The instruments are positioned on the meteorological tower in accordance with the guidance in Regulatory Guide 1.23, Revision 1. The justifications for the deviations for the pre-operational and operational programs are as follows:

- No moisture measurements (dew point or wet bulb temperature, relative humidity) are currently taken. Consequently, meteorological data needed in the analysis of the Ultimate Heat Sink and potential plumes from cooling tower operation was taken from other sources as described in FSAR Section 2.3.1, Regional Climatology. For the operational program, atmospheric moisture measurements are not required.
- The meteorological tower for the CCNPP site is located in an open field off Calvert Cliffs Parkway, north of the CCNPP Units 1 and 2 Independent Spent Fuel Storage Installation. The elevation at the base of the tower is approximately 125 ft (38m) above mean sea level. The meteorological tower was sited for CCNPP Units 1 and 2 according to the guidance provided in Safety Guide 23. The meteorological tower is located on level, open terrain at a distance at least 10 times the height of any nearby obstruction that exceeds one-half the height of the wind measurement with the exception of some trees that are located south of the tower. The tower is located far enough away from proposed CCNPP Unit 3 structures

and topographical features to avoid airflow modifications. The terrain height difference between the meteorological tower and the CCNPP Unit 3 reactor area is approximately 40 ft (12 m). The distance between the meteorological tower and the CCNPP Unit 3 reactor is approximately 2,900 ft (880 m). The terrain profile has a very gentle slope and has an insignificant impact on site dispersion conditions.

- The precipitation gauge did not initially have a wind shield installed as described in Regulatory Guide 1.23, Regulatory Position C.3. This was not a requirement stipulated in Safety Guide 23. A wind shield was installed in June 2009 so the precipitation gauge now conforms to Regulatory Guide 1.23, Revision 1.
- The guyed wire and anchor inspections are currently performed once every 5 years instead annually for the guyed wires and every 3 years for the anchors as provided in Regulatory Guide 1.23, Revision 1. This was not a requirement stipulated in Safety Guide 23. As part of the CCNPP Unit 3 operational program, guyed wire inspections will be performed annually and anchor inspections will be performed every 3 years in accordance with Regulatory Guide 1.23, Revision 1. Therefore, this will not be a deviation for the operational program.
- Ten seconds is the sampling rate used for the existing meteorological tower for CCNPP Units 1 and 2 and has not been shown to have any impact on data quality. Retaining the 10 second sampling rate will allow CCNPP Unit 3 to share data from the meteorological tower with CCNPP Units 1 and 2 without impacting the existing units and continue to meet the intent of regulatory guidance criteria relating to data quality for onsite meteorological measurements.

COLA Impact

FSAR Table 1.9-1, Conformance with Regulatory Guides, will be revised as follows in a future revision of the COLA:

RG / Rev	Description	Exception Descriptions	Reference
1.23, R1	Meteorological Monitoring Programs for Nuclear Power Plants	Atmospheric moisture data for the UHS and CWS cooling towers are not taken on site. They are taken from the closest source of atmospheric moisture data at the Patuxent River Naval Air Station. The meteorological tower is at a different elevation than plant grade to assure the tower is on a level, open terrain. <u>No wind shield installed on the precipitation gauge prior to June 2009.</u> <u>A digital data sampling rate of 10 seconds will be used instead of</u>	FSAR 2.3.3.1.7, 2.3.1.2.2.1-3, and 2.3.3.2.7 ER 6.4.1, 6.4.1.7, and 6.4.2.7

		5 seconds.	

FSAR Section 2.3.2, Local Meteorology, will be revised as follows in a future revision of the COLA:

The data recovery goal of 90% was met for each of the 6 years of data (2000 to 2005). The pre-operational meteorological monitoring program also meets the requirements of Regulatory Guide 1.23, Revision 1 (NRC, 2007a), with the following deviations: no atmospheric moisture measurements (required for plants utilizing cooling towers), tower not sited at approximately the same elevation as finished plant grade, no wind shield installed on the precipitation gauge prior to June 2009, a digital data sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1, and tower, guyed wire, and anchor inspection performance of once every 5 years instead of an annual inspection for tower and guyed wire and an anchor inspection of once every 3 years. These deviations are discussed further in Section 2.3.3.1.7.

FSAR Section 2.3.3.1, Preoperational Meteorological Measurement Program, will be revised as follows in a future revision of the COLA (Note: Only the final paragraph is shown):

This program was designed and maintained in accordance with the guidance provided in Safety Guide 23, "Onsite Meteorological Programs" (NRC, 1972). The pre-operational meteorological measurement program also meets the requirements of Regulatory Guide 1.23, Revision 1, "Meteorological Monitoring Programs for Nuclear Power Plants" (NRC, 2007), with the following deviations: no atmospheric moisture measurements (required for plants utilizing cooling towers), tower not sited at approximately the same elevation as finished plant grade; tower, guyed wire, and anchor inspection performance of once every 5 years instead of an annual inspection for tower and guyed wire and an anchor inspection of once every 3 years, no wind shield installed on the precipitation gauge prior to June 2009, and a digital data sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1. These deviations are discussed further in Section 2.3.3.1.7.

FSAR Section 2.3.3.1.7, Deviations to Guidance from Regulatory Guide 1.23, will be revised as follows in a future revision of the COLA:

The pre-operational meteorological monitoring program for CCNPP Unit 3 complies with Regulatory Guide 1.23, Revision 1 (NRC, 2007), except as follows. No atmospheric moisture measurements are taken. Atmospheric moisture data needed in the analysis of the CCNPP Unit 3 Ultimate Heat Sink and potential plumes from CCNPP Unit 3 cooling tower operation will be taken from other sources as described in Section 2.3.1. In addition, the meteorological tower is not sited at approximately the same elevation as finished CCNPP Unit 3 grade. This was done in order to assure that the meteorological tower is located on level, open terrain at a distance at least 10 times the height of any nearby obstruction that exceeds one-half the height of the wind measurement (i.e., the tower is located far enough away from CCNPP Unit 3 structures and topographical features to avoid airflow modifications). Further discussion is provided in Section 2.3.3.1.1. No wind shield was installed on the precipitation gauge prior to June 2009. Note that this was not a requirement stipulated in Safety Guide 23 (NRC, 1972). However, a wind shield was installed in 2009. Therefore, this will not be a deviation during the operational program. A digital data

sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1. Note that this was not a requirement stipulated in Safety Guide 23.

The tower, guyed wire, and anchor inspections are performed once every 5 years instead of an annual inspection for tower and guyed wire and an anchor inspection of once every 3 years as provided in Regulatory Guide 1.23, Revision 1 (NRC, 2007). Note that this was not a requirement stipulated in Safety Guide 23 (NRC, 1972). As part of the operational program, guyed wire inspections will be performed annually and anchor inspections will be performed once every 3 years. Therefore, this will not be a deviation for the operational program.

FSAR Section 2.3.3.2.7, Deviations to Guidance from Regulatory Guide 1.23, will be revised as follows in a future revision of the COLA:

The meteorological tower is not sited at approximately the same elevation as finished plant grade. This was done in order to assure that the meteorological tower is located on level, open terrain at a distance at least 10 times the height of any nearby obstruction that exceeds one-half the height of the wind measurement, i.e., the tower is located far enough away from CCNPP Unit 3 structures and topographical features to avoid airflow modifications. Further discussion is provided in Sections 2.3.3.1.6 and 2.3.3.2.1.

A digital data sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1 (NRC, 2007). CCNPP Unit 3 will share the same meteorological tower with CCNPP Units 1 and 2. Ten seconds is the sampling rate used for the existing meteorological tower for CCNPP Units 1 and 2 and has not been shown to have any impact on data quality. Retaining the 10 second sampling rate allows CCNPP Unit 3 to share data from the meteorological tower without impacting CCNPP Units 1 & 2 and continue to meet the intent of regulatory guidance criteria relating to data quality for onsite meteorological measurements.

ER Section 6.4.1, Preoperational Meteorological Measurement Program, will be revised as follows in a future revision of the COLA:

The pre-operational meteorological measurement program described herein for Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 utilizes the existing operational meteorological measurement program and equipment established for CCNPP Units 1 and 2. Data from the CCNPP Units 1 and 2 operational meteorological measurement program were used in this analysis for CCNPP Unit 3. CCNPP Unit 3 is to be located approximately 2,000 ft (610 m) south of CCNPP Units 1 and 2.

This program was designed and maintained in accordance with the guidance provided in Safety Guide 23, "Onsite Meteorological Programs" (NRC, 1972). The pre-operational meteorological measurement program also meets the requirements of Regulatory Guide 1.23, Revision 1, "Meteorological Monitoring Programs for Nuclear Power Plants" (NRC, 2007), with the following deviations: no atmospheric moisture measurements (required for plants utilizing cooling towers), tower not sited at approximately the same elevation as finished plant grade, no wind shield installed on the precipitation gauge prior to June 2009, a digital data sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1, and tower, guyed wire, and anchor

inspection performance of once every 5 years instead of an annual inspection for tower and guyed wire and an anchor inspection of once every 3 years. These deviations are discussed further in Section 6.4.1.7.

ER Section 6.4.1.7 Deviations to Guidance from Regulatory Guide 1.23, will be revised as follows in a future revision of the COLA:

The pre-operational meteorological monitoring program for CCNPP Unit 3 complies with Regulatory Guide 1.23, Revision 1 (NRC, 2007), except as follows. No atmospheric moisture measurements are taken. Atmospheric moisture data needed in the analysis of the CCNPP Unit 3 Ultimate Heat Sink and potential plumes from CCNPP Unit 3 cooling tower operation will be taken from other sources. In addition, the meteorological tower is not sited at approximately the same elevation as finished CCNPP Unit 3 grade. This was done in order to assure that the meteorological tower is located on level, open terrain at a distance at least 10 times the height of any nearby obstruction that exceeds one-half the height of the wind measurement (i.e., the tower is located far enough away from CCNPP Unit 3 structures and topographical features to avoid airflow modifications). Further discussion is provided in Section 6.4.1.1. No wind shield was installed on the precipitation gauge prior to June 2009. Note that this was not a requirement stipulated in Safety Guide 23 (NRC, 1972). However, a wind shield was installed in 2009. Therefore, this will not be a deviation during the operational program. A digital data sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1. Note that this was not a requirement stipulated in Safety Guide 23. CCNPP Unit 3 will share the same meteorological tower with CCNPP Units 1 and 2. Ten seconds is the sampling rate used for the existing meteorological tower for CCNPP Units 1 and 2 and has not been shown to have any impact on data quality. Retaining the 10 second sampling rate allows CCNPP Unit 3 to share data from the meteorological tower without impacting CCNPP Units 1 and 2 and continue to meet the intent of regulatory guidance criteria relating to data quality for onsite meteorological measurements.

The tower, guyed wire, and anchor inspections are performed once every 5 years instead of an annual inspection for tower and guyed wire and an anchor inspection of once every three years as provided in Regulatory Guide 1.23, Revision 1 (NRC, 2007). Note that this was not a requirement stipulated in Safety Guide 23 (NRC, 1972). Tower and guyed wire inspections will be performed annually and anchor inspections will be performed once every 3 years.

ER Section 6.4.2.7 Deviations to Guidance from Regulatory Guide 1.23, will be revised as follows in a future revision of the COLA:

The meteorological tower is not sited at approximately the same elevation as finished plant grade. This was done in order to assure that the meteorological tower is located on level, open terrain at a distance at least 10 times the height of any nearby obstruction that exceeds one-half the height of the wind measurement; i.e., the tower is located far enough away from CCNPP Unit 3 structures and topographical features to avoid airflow modifications. Further discussion is provided in Section 6.4.2.1.

A digital data sampling rate of 10 seconds is used instead of the sampling rate of 5 seconds described in Regulatory Guide 1.23, Revision 1 (NRC, 2007). CCNPP Unit 3 will share the same meteorological tower with CCNPP Units 1 and 2. Ten seconds is the sampling rate used for the existing meteorological tower for CCNPP Units 1 and 2 and has not been

shown to have any impact on data quality. Retaining the 10 second sampling rate allows CCNPP Unit 3 to share data from the meteorological tower without impacting CCNPP Units 1 and 2 and continue to meet the intent of regulatory guidance criteria relating to data quality for onsite meteorological measurements.