



10 CFR 50.4  
10 CFR 52.79

December 18, 2009

UN#09-523

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. 149, Local Meteorology

- Reference:
- 1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI No. 149 RSAC 3128" email dated September 17, 2009
  - 2) Letter UN#09-505, from G. Gibson (UniStar Nuclear Energy) to Document Control Desk (NRC), "Response to RAI No. 149, Local Meteorology," dated December 7, 2009
  - 3) Letter UN#09-516, G. Gibson (UniStar Nuclear Energy) to Document Control Desk (NRC), "Response to RAI No. 1014, NO<sub>x</sub> and VOC (Ozone Precursor) Air Emissions During Construction and Operation," dated December 11, 2009

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 September 17, 2009 (Reference 1). This RAI addresses Local Meteorology, as discussed in Section 2.3.2 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.

Reference 2 anticipated a response date of December 30, 2009 for RAI 149 Question 02.03.02-22. The enclosure provides our response to Question 02.03.02-22, and

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includes revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA.

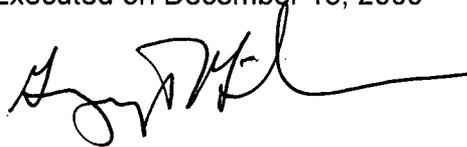
Reference 3 satisfied Regulatory Commitment CC-09-0002 and added a new Regulatory Commitment, CC-09-0009. Per Regulatory Commitment CC-09-0009, UniStar Nuclear Engineering will transmit proposed mitigation measures to the NRC by March 31, 2010.

Our response to RAI No. 149, Question 02.03.02-22 does not include any new regulatory commitments. This letter does not contain any sensitive or proprietary information.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 495-2436.

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

Executed on December 18, 2009



Greg Gibson

Enclosure: Response to NRC Request for Additional Information RAI No. 149, Question 02.03.02-22, Local Meteorology, 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

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**Enclosure**

**Response to NRC Request for Additional Information  
RAI No. 149, Question 02.03.02-22, Local Meteorology  
Calvert Cliffs Nuclear Power Plant, Unit 3**

**RAI No. 149**

**Question 02.03.02-22**

The Staff considered the response to RAI Question No. 02.03.02-9 for the COL FSAR, submitted on July 28, 2008 (ML082130381 and ML082130385), regarding the non-attainment status designation of Calvert County, MD for the 8-hour ozone National Ambient Air Quality Standard. The response indicates (among other things) that:

- the trigger levels for establishing CCNPP Unit 3 as a minor source of ozone (i.e., nitrogen oxides (NO<sub>x</sub>) and volatile organic compound (VOC) emissions) are 25 tons per year, respectively;
- emissions from CCNPP Unit 3 will be below these trigger levels for both NO<sub>x</sub> and VOCs, and as a result CCNPP Unit 3 will be defined as a minor source for these attainment pollutants, and at the same time defined as a minor source of NO<sub>x</sub> and VOCs for the pollutant ozone;
- typical sources of NO<sub>x</sub> during construction and operation of CCNPP Unit 3 will include vehicle operation and periodic operation of diesel generators, that these sources are small, and their operation is intermittent; and
- non-attainment with the U.S. EPA 8-hour ozone standard will not have a potential impact on construction or operation of CCNPP Unit 3.

NUREG-0800, SRP Section 2.3.2, Section III (Review Procedures), Item (3e), indicates that air quality conditions used for design and operating basis considerations should have been addressed by the applicant. The Staff acknowledges that the attainment status designations for the various criteria air pollutants, including identification of the non-attainment designation of Calvert County for the 8-hour ambient standard for ozone, has been discussed in COL FSAR Section 2.3.2.1.6 (a parallel discussion also appears in COL FSAR Section 2.3.1.2.1). However, the relevance of these conditions to the design and operation of CCNPP Unit 3 has not been addressed.

SRP Section 2.3.2, Section II (Acceptance Criteria), SRP Acceptance Criterion (3) calls for a "discussion and evaluation of the influence of the plant and its facilities on the local meteorological and air quality conditions" to be provided. Therefore, in order to fully resolve this concern, the Applicant should update COL FSAR Section 2.3.2.1.6, and the parallel discussion in COL FSAR Section 2.3.1.2.1, by addressing the following technical issues:

(a) Discuss the applicability of the attainment and non-attainment status designations on the design and operation of CCNPP Unit 3 (similar to the July 28, 2008 response to RAI Question No. 02.03.02-9), making a distinction between the construction and operation phases as appropriate.

(b) Reconcile the difference between the statements in Paragraph 1 of COL FSAR Section 2.3.2.1.6 indicating that Calvert County "is in attainment....except for the 8 hour ozone standard (EPA, 2007b)" and the statement in Paragraph 2 of that section indicating that "and unclassifiable/attainment for carbon monoxide, PM2.5..., and for the 8 hour ozone standard (CFR 2007b)". The former statement is consistent with the reference cited in Paragraph 2.

(c) Tables 5.5-3 and 5.5-5 under Section 5 of the "Technical Report in Support of Application for...Certificate of Public Convenience and Necessity...for Authorization to Construct Unit 3 at

Calvert Cliffs Nuclear Power Plant" (ML090680160) give an estimated maximum annual emission rate of 161.9 tons per year of NO<sub>x</sub> (as NO<sub>2</sub>) due to equipment fuel combustion during Construction Year 2. Given the above, confirm or clarify that portion of the response to RAI Question No. 02.03.02-9 which indicates that ozone pre-cursor emissions (i.e., NO<sub>x</sub> and VOCs) will be less than the 25 tons per year minor source trigger level for both pollutants and the statement in the last paragraph of the response that "non-attainment with the EPA 8-hour ozone standard will not have a potential impact on construction...". Update COL FSAR Section 2.3.2.1.6 accordingly.

(d) Cite the reference(s) that provide the basis for these (or revised) statements and incorporate in COL FSAR Sections 2.3.2.1.6 and 2.3.1.2.1, and the accompanying reference lists for COL FSAR Sections 2.3.2 and 2.3.1.

### **Response**

(a) The EPA designated the Washington region, including Calvert County, as moderate nonattainment for the 8-hour ozone standard in 2004. For regions designated as nonattainment, the EPA requires a plan describing how emissions will be reduced to attain and maintain the National Ambient Air Quality Standards (NAAQS). The EPA-required plan, called a State Implementation Plan for the Washington region (including Calvert County) includes actions planned to achieve attainment of the Federal standard for ozone, and a list of measures to reduce pollution from ozone-forming gases. These measures include substantial reductions of the ozone precursor, nitrogen oxides (NO<sub>x</sub>). Implementation of these measures is further directed under the recently enacted Maryland Healthy Air Act.

Unlike power plants that use combustion of fossil fuel as their energy source, operation of Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 will not result in significant generation of NO<sub>x</sub> emissions, or significant releases other ozone-forming emissions, such as volatile organic compounds (VOC). Typical sources of NO<sub>x</sub> during operation of CCNPP Unit 3 will include vehicle operation and periodic operation of diesel generators that are used to provide backup power. These NO<sub>x</sub> sources are small, their operation is intermittent and, as a result, their contribution to regional ozone levels will be insignificant. VOC emissions will be largely limited to activities such as the application of paint and coatings, and are also expected to be small and intermittent, resulting in insignificant contribution to regional ozone levels. The vehicle sources are addressed under the Environmental Protection Agency's (EPA's) General Conformity regulations, while stationary sources are addressed under Maryland's air permitting program.

General Conformity regulations preclude Federal entities (e.g., NRC) from taking actions in nonattainment areas without ensuring that construction and operational emissions do not interfere with reasonable progress goals to bring nonattainment areas back into compliance with applicable ambient standards. EPA has designated threshold levels of annual emissions of ozone precursors (NO<sub>x</sub> and VOC), below which no formal Conformity Determination is required. These levels are 100 and 50 tons per year for NO<sub>x</sub> and VOC, respectively, in Calvert County.

In the case of CCNPP Unit 3, this evaluation has been performed on vehicular emissions and the stationary sources that will be a result of facility operation are addressed below as permitted emission sources. UNE has determined that the NO<sub>x</sub> and VOC emissions from operational sources excluding permitted stationary sources are below the threshold levels. Therefore, a General Conformity Determination is not required for operational years.

Emissions of NO<sub>x</sub> and VOCs from the stationary sources (e.g., emergency diesel generators) are subject to restrictions imposed under the Certificate of Public Convenience and Necessity (CPCN) issued by Maryland Public Service Commission for CCNPP Unit 3 effective June 26, 2009. The CPCN also constitutes the issuance of the Air Quality Permit to Construct, including approval of a Prevention of Significant Deterioration (PSD) permit based on review by the Power Plant Research Program (PPRP) and Maryland Department of the Environment (MDE).

Based on the fact that Calvert County is designated as a nonattainment area for the 8-hour ozone standard, applicability of CCNPP Unit 3 to the requirements of nonattainment New Source Review were also reviewed. The trigger levels for nonattainment New Source Review are project emissions of ozone precursors (i.e., nitrogen oxide and VOC emissions) of 25 tons per year for each precursor. Emissions from CCNPP Unit 3 will be below these trigger levels for both NO<sub>x</sub> and VOCs, and as a result, CCNPP Unit 3 is considered a minor modification not subject to nonattainment New Source Review requirements. Consequently, the ozone nonattainment designation for Calvert County will not impact the operation of CCNPP Unit 3.

In terms of the impact on the ozone nonattainment area from construction related NO<sub>x</sub> and VOC emissions, UniStar Nuclear Energy (UNE) updated the previous emission estimates provided in the CPCN Technical Reports filed with the Maryland Public Service Commission (PSC) in November 2007 and later amended in August 2008. These reports evaluated onsite NO<sub>x</sub> and VOC emissions related to construction and did not address indirect emissions from activities outside the construction site that are required in a formal conformity applicability analysis. The General Conformity regulations preclude Federal entities (e.g., NRC) from taking actions in nonattainment areas without ensuring that construction and operational emissions do not interfere with reasonable progress goals to bring nonattainment areas back into compliance with applicable ambient standards.

The updated analysis<sup>1</sup> determined annual emissions of these pollutants during the years of construction are above applicable tonnage thresholds for applicability of General Conformity requirements. Currently, the applicable thresholds are 100 tons per year of NO<sub>x</sub> and 50 tons per year of VOC emissions. UNE previously committed (Regulatory Commitment No. CC-09-0009) to March 31, 2010 as a date to transmit proposed mitigation measures for CCNPP Unit 3 NO<sub>x</sub> emissions to NRC.<sup>1</sup>

(b) Statements in COL FSAR Section 2.3.2.1.6 and Section 2.3.1.2.1 will be revised to reconcile that the area is designated as a moderate nonattainment area for the 8 hour ozone standard.

(c) The response to RAI Question No. 02.03.02-9 only considered CCNPP Unit 3 operational impacts. UNE submitted updated NO<sub>x</sub> and VOC emissions from construction activities to the NRC based on revised information.<sup>1</sup> The report (see Table, below) estimates that NO<sub>x</sub> emissions from on-site construction activities to be greater than the 100 ton per year threshold for years 4 through 7. If indirect emissions are included (e.g., employee commuting, material deliveries), then construction year 2 and year 8 also surpass the threshold. Estimated VOC emissions are below its 50 ton per year threshold for all years regardless of the definition of construction employed.

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<sup>1</sup> Letter UN#09-516, G. Gibson (UniStar Nuclear Energy) to Document Control Desk (NRC), "Response to RAI No. 1014, NO<sub>x</sub> and VOC (Ozone Precursor) Air Emissions During Construction and Operation," dated December 11, 2009.

Construction Year	NO <sub>x</sub> Emissions per 10 CFR 50 (tons)	NO <sub>x</sub> Emissions all construction (tons)	VOC Emissions per 10 CFR 50 (tons)	VOC Emissions all construction (tons)
1	0	40.5	0	8.2
2	0	<b>166.0</b>	0	32.7
3	22.8	76.5	1.5	24.4
4	<b>119.3</b>	<b>193.8</b>	8.1	40.7
5	<b>148.7</b>	<b>241.0</b>	10.0	46.8
6	<b>150.8</b>	<b>242.0</b>	10.2	43.4
7	<b>134.7</b>	<b>207.8</b>	9.2	37.3
8	69.0	<b>118.0</b>	4.7	21.2
9	5.5	24.4	0.52	6.2

Note: Bold text indicates greater than conformity threshold.

UNE has committed (Regulatory Commitment No. CC-09-0009) to March 31, 2010 as a date to transmit proposed mitigation measures for CCNPP Unit 3 NO<sub>x</sub> emissions to NRC.

(d) The following references are used for statements provided in FSAR Sections 2.3.2.1.6 and 2.3.1.2.1 presented in RAI 149, Question 2.3.2-22, parts (a) through (c).

- AECOM, 2009. "NO<sub>x</sub> and VOC Emissions from Construction Activities and Air Conformity Applicability Calvert Cliffs Unit 3", December 2009.
- National Primary and Secondary Ambient Air Quality Standards, Title 40, Code of Federal Regulations, Part 50, 2009.
- Southern Maryland Intrastate Air Quality Control Region, Title 40, Code of Federal Regulations, Part 81.156, 2009.
- Maryland, Title 40, Code of Federal Regulations, Part 81.321, 2009.
- Nonattainment Map for Maryland, U.S. Environmental Protection Agency, Website: <http://www.epa.gov/air/oaqps/greenbk/>; Last updated on October 8, 2009.
- National Ambient Air Quality Standards (NAAQS), U.S. Environmental Protection Agency, Website: <http://epa.gov/air/criteria.html>; Last updated on July 14, 2009

The basis for revised statements in FSAR Sections 2.3.2.1.6 and 2.3.1.2.1 will be cited in FSAR Sections 2.3.1.2.3 and 2.3.2.4, respectively. The reference will be supplemented or revised as necessary.

## COLA Impact

FSAR Section 2.3.1.2.1 will be revised as follows in a future version of the COLA:

### 2.3.1.2.1 Regional Air Quality

#### Background

The Clean Air Act (PL, 1977), which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (CFR, 2009<sup>7a</sup>) for pollutants considered harmful to public health and the environment. The Clean Air Act

established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air ( $\text{mg}/\text{m}^3$ ), and micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ). Areas are either in attainment of the air quality standards or in nonattainment. Attainment means that the air quality is better than the standard.

### **Calvert County**

Based on EPA data, Calvert County, Maryland, is in attainment for all the National Ambient Air Quality Standards (NAAQS) except for the 8 hour ozone standard (EPA, 20097a) as of October 8, 2009-December 5, 2006. The 8 hour ozone standard is 0.08 ppm and attainment is determined by whether the 3 year average of the fourth-highest daily maximum 8 hour average ozone concentrations measured at each monitor within an area over each year exceeds the standard. From Figure 2.3-13, it can be seen that the fourth-highest 8 hour average ozone concentration for Calvert County during 2006 is greater than 0.08 ppm and less than or equal to 1.0 ppm. Nonattainment of the 8 hour ozone standard is due to its proximity to Washington, D.C. A nonattainment designation requires a state plan to be sent to the EPA describing how the area will implement air quality improvements. The NAAQS are presented in Table 2.3-1 (EPA, 20097b). Note that the Maryland Department of the Environment reported that ground-level ozone levels have continued to show significant improvements since the early 1990's (MDE, 2007).

Calvert County is part of the Southern Maryland Intrastate Air Quality Control Region (AQCR), as designated in 40 CFR 81.156 (CFR, 20097b). The attainment status of the Southern Maryland Intrastate AQCR with regard to national ambient air quality standards is listed as being better than national standards for total suspended particulates, ~~sulphur~~ sulfur dioxide, and nitrogen dioxide, and unclassifiable/attainment for carbon monoxide, PM2.5 (particulate matter with diameter less than 2.5 microns), and designated as a moderate nonattainment area for the 8 hour ozone standard (CFR, 20097c).

### **Class 1 Federal Lands**

Class 1 federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protections under Section 162(a) of the federal Clean Air Act. 40 CFR Section 51.307 requires the operator of any new major stationary source or major modification located within 62 mi (100 km) of a Class I area to contact the Federal Land Managers for that area.

The closest Class 1 Federal Lands to the CCNPP site are Shenandoah National Park and the ~~Fish and Wildlife Service Brigantine~~ National Wildlife Refuge site in New Jersey. The distance from the CCNPP site to Shenandoah National Park, Virginia, is approximately 87 mi (140 km). The distance from the CCNPP site to the ~~Fish and Wildlife Service Brigantine~~ site in New Jersey is approximately 112 mi (180 km).

FSAR Section 2.3.1.2.3 will be revised as follows in a future version of the COLA:

### **2.3.1.2.3 References**

**CFR, 20072009a.** National Primary and Secondary Ambient Air Quality Standards, Title 40, Code of Federal Regulations, Part 50, 20072009.

**CFR, 20072009b.** Southern Maryland Intrastate Air Quality Control Region, Title 40, Code of Federal Regulations, Part 81.156, 20072009.

**CFR, 20072009c.** Maryland, Title 40, Code of Federal Regulations, Part 81.321, 20072009.

**EPA, 20072009a.** Nonattainment Map for Maryland, U.S. Environmental Protection Agency, Website: <http://www.epa.gov/air/oagps/greenbk/http://www.epa.gov/airdata/nonat.html?st=MD> Maryland Date accessed: ~~March 30, 2007~~ Last updated on October 8, 2009.

**EPA, 20072009b.** National Ambient Air Quality Standards (NAAQS), U.S. Environmental Protection Agency, Website: <http://epa.gov/air/criteria.html>, Last updated on July 14, 2009 Data accessed: ~~May 2007~~.

FSAR Section 2.3.2.1.6 will be revised as follows in a future version of the COLA:

### **2.3.2.1.6 Air Quality**

Based on EPA data, Calvert County, Maryland, is in attainment for all the National Ambient Air Quality Standards (NAAQS) except for the 8 hour ozone standard (EPA, 20097b) as of October 8, 2009 ~~December 5, 2006~~. Attainment means that the air quality is better than the standard. The 8 hour ozone standard is 0.08 ppm and attainment is determined by whether the 3 year average of the fourth highest daily maximum 8 hour average ozone concentrations measured at each monitor within an area over each year exceeds the standard. From Figure 2.3-206 it can be seen that the fourth highest, 8 hour average ozone concentration for Calvert County during 2006 is greater than 0.08 ppm and less than or equal to 1.0 ppm. Nonattainment of the 8 hour ozone standard is due to its proximity to Washington, D.C. A nonattainment designation requires a state plan to be sent to the EPA describing how the area will implement air quality improvements. The NAAQS (EPA, 20097c) are presented in Table 2.3-107. Note that the Maryland Department of the Environment reported that ground-level ozone levels have continued to show significant improvements since the early 1990's (MDE, 2006).

Calvert County is part of the Southern Maryland Intrastate Air Quality Control Region (AQCR), as designated in 40 CFR 81.156 (CFR, 20097a). The attainment status of the Southern Maryland Intrastate AQCR with regard to national ambient air quality standards is listed as being better than national standards for total suspended particulates, sulphur sulfur dioxide, and nitrogen dioxide, and unclassifiable/attainment for carbon monoxide, PM<sub>2.5</sub> (particulate matter with diameter less than 2.5 microns), and designated as a moderate nonattainment area for the 8 hour ozone standard (CFR, 20097b).

Updated construction emission calculations (AECOM, 2009) show that estimate NO<sub>x</sub> emissions will be greater than the applicable threshold for some years of construction.

FSAR Section 2.3.2.4 will be revised as follows in a future version of the COLA:

#### **2.3.2.4 References**

**AECOM, 2009.** "NO<sub>x</sub> and VOC Emissions from Construction Activities and Air Conformity Applicability Calvert Cliffs Unit 3", December 2009.

**CFR, 20072009a.** Southern Maryland Intrastate Air Quality Control Region, Title 40, Code of Federal Regulations, Part 81.156, 20072009.

**CFR, 20072009b.** Maryland, Title 40, Code of Federal Regulations, Part 81.321, 20072009.

**EPA, 20072009a.** Support Center for Regulatory Air Models, U.S. Environmental Protection Agency, Website: <http://www.epa.gov/scram001/>, Date accessed: June 20072009.

**EPA, 20072009b.** Nonattainment Map for Maryland, U.S. Environmental Protection Agency, Website: <http://www.epa.gov/air/oaqps/greenbk/>, <http://www.epa.gov/airdata/nonat.html?st=MD~Maryland>, Date accessed: March 30, 2007Last updated on October 8, 2009.

**EPA, 20072009c.** National Ambient Air Quality Standards (NAAQS), U.S. Environmental Protection Agency, Website: <http://epa.gov/air/criteria.html>, ~~Date accessed: May 2007~~ Last updated on July 14, 2009.