Greg Gibson
Vice President, Regulatory Affairs

750 East Pratt Street, Suite 1600
Baltimore, Maryland 21202

UniStar
NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

August 21, 2009

UN#09-359

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. 35, Turbine Area Ventilation System
RAI No. 87, Engineered Safety Feature (ESF) Ventilation System

References:
1) John Rycyna (NRC) to George Wrobel (UniStar Nuclear Energy), "RAI No 34 SPCV 297 and RAI No 35 SPCV 296 (P)" email dated November 20, 2008

2) John Rycyna (NRC) to Robert Poche (UniStar Nuclear Energy), "RAI No. 87 SPCV 1702.doc (PUBLIC)" email dated March 26, 2009

3) UniStar Nuclear Energy Letter UN#09-321, from Greg Gibson to Document Control Desk, U.S. NRC, Response to RAI No. 35, Turbine Area Ventilation System, and RAI No. 87, ESF Ventilation System, dated July 24, 2009

The purpose of this letter is to respond to the requests for additional information (RAIs) identified in the NRC e-mail correspondence to UniStar Nuclear Energy, dated November 20, 2008 (Reference 1) and March 26, 2009 (Reference 2). These RAIs address the Turbine Area Ventilation System and the ESF Ventilation System, as discussed in Sections

D096
NRO

9.4.4 and 9.4.15 of the Final Safety Analysis Report, as submitted in Part 2 of the Calvert Cliffs Nuclear Power Plant, Unit 3 Combined License Application, Revision 5.

References 1 and 2 requested UniStar Nuclear Energy respond to RAI No. 35 and RAI No. 87 within 30 days. In Reference 3 it was stated that a response to RAI No. 35, Question 09.04.04-1, and RAI No. 87, Question 09.04.05-1, Part A, would be provided by August 21, 2009. The enclosure provides our responses to RAI No. 35, Question 09.04.04-1 and RAI No. 87, Question 09.04.05-1, Part A, and includes revised COLA content.

There are no regulatory commitments identified in this letter.

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 August 21, 2009

Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI No. 35, Question 09.04.04-1, Turbine Area Ventilation System, and RAI No. 87, Question 09.04.05-1, Part A, ESF Ventilation System, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR COL Application
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/RDS/kat

UN#09-359

Enclosure

**Response to NRC Request for Additional Information,
RAI No. 35, Question 09.04.04-1, Turbine Area Ventilation System, and
RAI No. 87, Question 09.04.05-1, Part A, ESF Ventilation System,
Calvert Cliffs Nuclear Power Plant, Unit 3**

RAI No 35

Question 09.04.04-1

The applicant's FSAR does not provide design information on the Turbine Building Ventilation System. The FSAR references the U.S. EPR DCD with no departures or supplements. Section 9.4.4, "Turbine Building Ventilation System," consists of a paragraph which states that the turbine building is classified as non-safety related system. It does not provide information described in RG 1.206, Section C.I.9:

"For systems that have little or no role in protecting the public against exposure to radiation, the description should provide enough information to allow the NRC staff to understand the design and operation and their effect on reactor safety, with emphasis on those aspects of design and operation that might affect the reactor and its safety features or contribute to the control of radioactivity."

"In addition, the information provided (e.g., a failure analysis) should clearly show the system's capability to function without compromising the safe operation of the plant under both normal operating and transient situations."

"The applicant should state seismic design classifications with reference to detailed information provided in Chapter 3 of the FSAR, where appropriate. The applicant should also summarize radiological considerations associated with the operation of each system under normal and accident conditions, where applicable, with reference to detailed information in Chapters 11 or 12, as appropriate."

Please submit more specific information for the Turbine Building Ventilation System, as described in RG 1.206, Section C.I.9.4.4 guidance, or justify an alternative.

Response

The turbine building does not contain safety-related equipment. Therefore, the Turbine Building Ventilation System does not serve any safety-related function, has no safety design basis, and is not required to operate during or following a design basis accident. As such, single failure, environmental qualification and redundancy are not applicable to the Turbine Building Ventilation System.

The Turbine Building Ventilation System operates during startup, shutdown, and normal plant operations to maintain acceptable air temperatures in the Turbine Building for equipment operation and for personnel working in the building. The system is not relied upon during Station Blackout and Abnormal (e.g. Loss of Off-Site Power) operation.

The Turbine Building Ventilation system is sized to provide the heating, ventilation, and cooling requirements during startup, shutdown, and normal plant operations. The system is designed to maintain a positive pressure to mitigate intrusion of dust and dirt into the Turbine Building.

The ambient outside design conditions for the Turbine Building Ventilation System are established as -10°F for the minimum temperature and 100°F for maximum temperature. The Turbine Building Ventilation System maintains the bulk average temperature within the Turbine

Building during normal plant operation at or above 50°F during winter design conditions and at or below 115°F during summer design conditions.

The rate of ventilation is based on maintaining permissible temperatures in areas with appreciable heat gains. For areas with no appreciable heat gains, the rate of ventilation is based on the number of air changes per hour, depending on the specific area being ventilated.

The Turbine Building Ventilation System performs no safety-related functions; therefore a systems failure analysis is not required. There are no safety-related SSCs in the Turbine Building that directly provide a reactor trip; therefore GDC 2 is not applicable. The non-safety Turbine Building Ventilation System shares no SSCs between units, therefore this does not adversely impair any safety-related system, as required by GDC 5. The Turbine Building Ventilation System is not exposed to any radiological contamination; therefore the requirements of GDC 60 are not applicable.

COLA Impact

FSAR Section 9.4.4 will be revised as follows in a future COLA revision:

9.4.4 TURBINE BUILDING VENTILATION SYSTEM

~~No departures or supplements.~~

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

9.4.4.1 Design Basis

The turbine building does not contain safety-related equipment. Therefore, the Turbine Building Ventilation System does not serve any safety-related function, has no safety design basis, and is not required to operate during or following a design basis accident. As such, single failure, environmental qualification and redundancy are not applicable to the Turbine Building Ventilation System.

The Turbine Building Ventilation System operates during startup, shutdown, and normal plant operations to maintain acceptable air temperatures in the Turbine Building for equipment operation and for personnel working in the building. The system is not relied upon during Station Blackout and Abnormal (e.g. Loss of Off-Site Power) operation.

The Turbine Building Ventilation system is sized to provide the heating, ventilation, and cooling requirements during startup, shutdown, and normal plant operations. The system is designed to maintain a positive pressure to mitigate intrusion of dust and dirt into the Turbine Building.

The ambient outside design conditions for the Turbine Building Ventilation System are established as -10°F for the minimum temperature and 100°F for maximum temperature. The Turbine Building Ventilation System maintains the bulk average temperature within the Turbine Building during normal plant operation at or above

50°F during winter design conditions and at or below 115°F during summer design conditions.

The rate of ventilation is based on maintaining permissible temperatures in areas with appreciable heat gains. For areas with no appreciable heat gains, the rate of ventilation is based on the number of air changes per hour, depending on the specific area being ventilated.

The Turbine Building Ventilation System provides the following functions:

- Maintain personnel comfort in normally occupied areas of the building
- Maintain closed space ambient conditions for proper equipment operation within the Turbine Building
- Remove heat generated by equipment
- Provide fire dampers to separate the different fire zones
- Smoke venting of the turbine hall
- Availability of system operation with manual or automatic actuation for essential system functions

9.4.4.2 System Description

The Turbine Building Ventilation System is shown in Figure 9.4-2.

Outside air is supplied to the Turbine Building by fans via intake louvers and exhausted to the atmosphere by roof exhaust ventilators. During normal operation outside air is mixed with recirculated air to maintain a positive pressure in the Turbine Building.

The Turbine Building Ventilation System removes heat generated by equipment and from the environment to maintain acceptable indoor ambient conditions. Unit heaters are used to maintain the minimum room temperatures within the Turbine Building.

An air conditioning unit in the sampling room located on the basement floor maintains the sample lab equipment at a design minimum temperature of 50°F, and a design maximum temperature of 95°F.

There is no realignment or operator action required in response to radiation or other safety actuation signals for the Turbine Building Ventilation System.

The Turbine Building Ventilation System is designed as a non seismic system since there are no seismic Category I SSCs inside the Turbine Building.

9.4.4.2.1 Component Description

The following components are designed to the codes and standards identified below.

Air Conditioning Unit

The air conditioning unit for the sampling room is located on the basement floor of the Turbine Building. The cooling and heating coils are designed per ASME AG-1-2003 (ASME, 2003).

Ventilation Fans

Two basic types of ventilation fans are used for air supply, exhaust, and recirculation. These are propeller fans for low pressure, and axial fans for higher pressure (ducted) applications. Fan performance is rated to Air Moving and Conditioning Association ANSI/AMCA 210 (ANSI, 1999), ANSI/AMCA 211 (ANSI, 1987), and ANSI/AMCA 300 (ANSI, 1985).

Roof Exhaust Fans

To maintain acceptable pressures within the building, roof exhaust fans are provided which work in conjunction with the relief vents. Fan performance is rated to Air Moving and Conditioning Association ANSI/AMCA 210 (ANSI, 1999), ANSI/AMCA 211 (ANSI, 1987), and ANSI/AMCA 300 (ANSI, 1985).

Relief Vents

Supply fans that are associated with relief vents are capable of recirculating the air as well as providing air to a room. The relief vents provide a flow out of the room. The relief vents are designed per ASME AG-1-2003 (ASME, 2003).

Electric and Hot Water Space Heaters

To maintain the minimum room temperatures within the Turbine Building, electric unit heaters or hot water space heaters are provided. Hot water space heaters are supplied from the space heating system with either the secondary steam or auxiliary boiler. Heaters are designed to commercial standards.

Air Filters

Air filters are provided for various fans to reduce the amount of dust within the ventilated area. The air conditioning unit contains a high efficiency air filter to reduce the amount of dust on the cooling coils. The remaining filters use moderate efficiency filters. The filters are replaceable modular filter elements. The filters are designed per ASME AG-1-2003 (ASME, 2003).

Louvers

Outside air is supplied by fans via intake louvers. The louvers are designed per ASME AG-1-2003 (ASME, 2003).

Dampers (manual, pneumatic, motor-operated, fire)

Manual dampers are used in the ducted system to balance airflow.

Pneumatic dampers are used to control the flow of the air through the various ductwork branches and to maintain a slight positive pressure in the building. In cases where the dampers modulate (i.e., variable intake/recirculation supplies), the dampers are of opposed blade design. Dampers used for shut-off are of parallel blade design. Motor operated dampers fail "as-is" in the case of power loss. Dampers in ductwork that exceed certain higher flow rates use airfoil shaped blades. This minimizes the pressure drop across the damper.

When ductwork passes through a fire barrier wall, fire dampers are installed in the wall with the ductwork mounted on either side. Duct access is provided for inspecting and replacing fire damper fusible links. The fire dampers have a fire rating consistent with the associated fire barrier wall rating. The dampers are designed per ASME AG-1-2003 (ASME, 2003) and UL 555-2006 (UL, 2006).

9.4.4.2.2 System Operation

The Turbine Building Ventilation System is manually controlled. Roof exhaust fans and supply fans are manually started and stopped as required to satisfy space temperature conditions and to maintain a positive pressure in the Turbine Building.

Electric unit heaters and hot water space heaters are controlled automatically or manually. In the automatic mode, the electric unit heater fan motors are thermostatically controlled by their respective space thermostats. The space heating system supplies hot water to the hot water space heaters from either the secondary steam or auxiliary boiler.

9.4.4.3 Safety Evaluation

The Turbine Building Ventilation System performs no safety-related functions; therefore a systems failure analysis is not required. The Turbine Building Ventilation System is not required to operate during or following a design basis accident.

There are no safety-related SSCs in the Turbine Building that directly provide a reactor trip, therefore GDC 2 is not applicable.

The non-safety Turbine Building Ventilation System shares no SSCs between units, therefore this does not adversely impair any safety-related system, as required by GDC 5.

The Turbine Building Ventilation System is not exposed to any radiological contamination; therefore the requirements of GDC 60 are not applicable.

9.4.4.4 Inspection and Testing Requirements

Shop inspection and testing are performed by the manufacturer for major components, including heating and cooling coils and controls.

The Turbine Building Ventilation System is designed to permit periodic inspection of system components during normal plant operation.

Fans are rated and tested in accordance with the standards of Air Moving and Conditioning Association (ANSI/AMCA 210 (ANSI, 1999), ANSI/AMCA 211 (ANSI, 1987), and ANSI/AMCA 300 (ANSI, 1985).

The performance and testing requirements of the dampers are per ASME AG-1-2003 (ASME, 2003).

The filters meet the specifications of ANSI/ASHRAE Standard 52.2 (ANSI/ASHRAE, 1999).

The ductwork meets the design, construction, and testing requirements of ASME AG-1-2003 (ASME, 2003).

9.4.4.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of remote operated dampers, instrument indications and alarms are provided in the Main Control Room (MCR). Fans, motor-operated dampers, and electric unit heaters are manual and auto-operable from the MCR.

9.4.4.6 References

ANSI, 1985. Air Moving and Conditioning Association (ANSI/AMCA) 300, Reverberant Room Method of Testing Fans for Rating Purpose, American National Standards Institute, 1985.

ANSI, 1987. Air Moving and Conditioning Association (ANSI/AMCA) 211, Certified Ratings Program-Air Performance, American National Standards Institute, 1987.

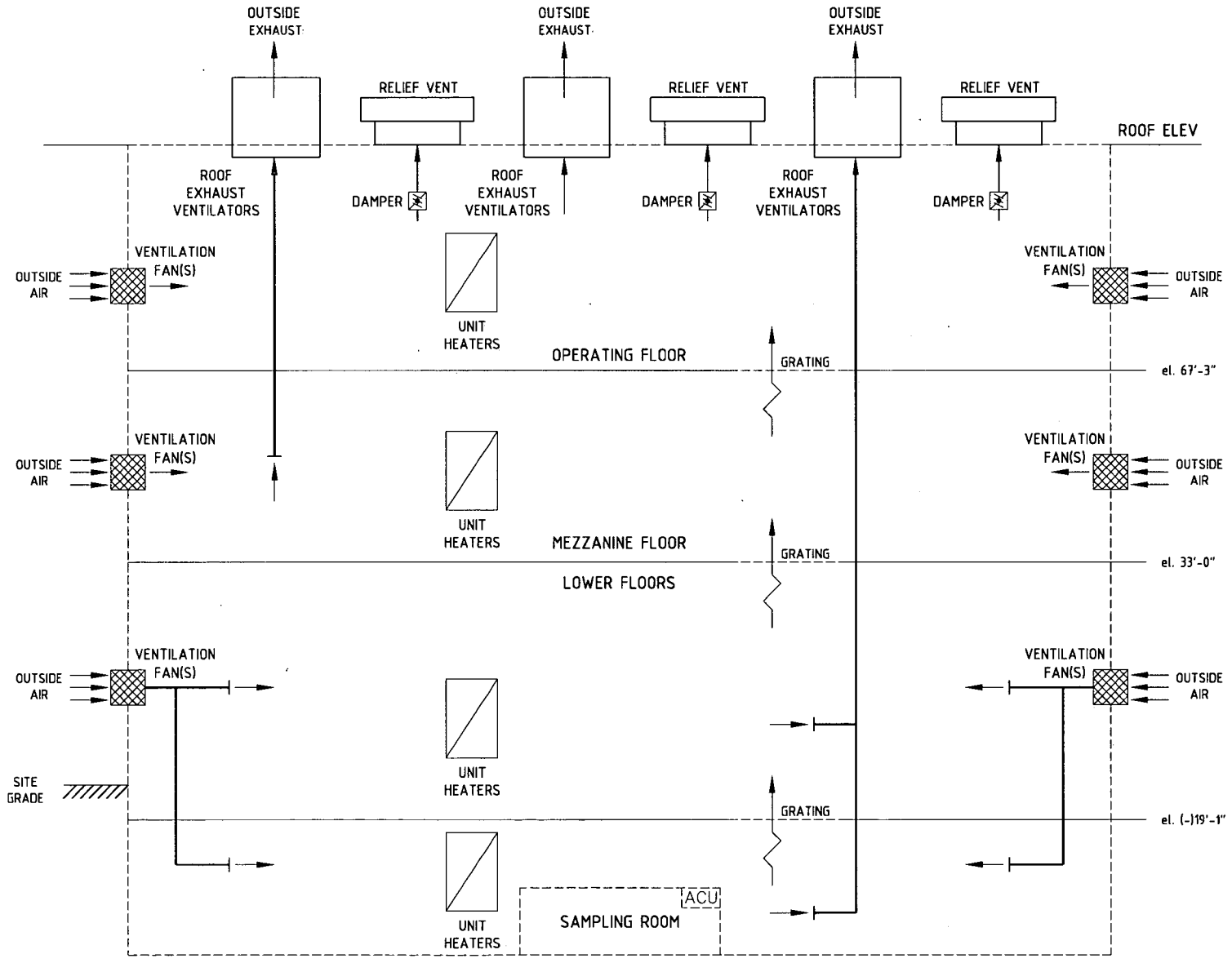
ANSI, 1999. Air Moving and Conditioning Association (ANSI/AMCA) 210, Laboratory Methods of Testing Fans of Aerodynamics Performance Rating, American National Standards Institute, 1999.

ANSI/ASHRAE, 1999. Standard 52.2, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size, American National Standards Institute, 1999.

ASME, 2003. ASME AG-1 -2003, Code of Nuclear Air and Gas Treatment, American Society of Mechanical Engineers, 2003.

UL, 2006. Underwriters Laboratories' Standard UL 555, Standard for Safety Fire Dampers, 2006.

Figure 9.4-2 - {Turbine Building Ventilation System}



NOTES:

ACU - AIR CONDITIONING UNIT

DRAWING IS A GENERAL SCHEMATIC OF THE TURBINE BUILDING VENTILATION SYSTEM

RAI No 87

Question 09.04.05-1

(A)

TBVS design information (Relates to SRP Section 9.4.4)

SRP Section 9.4.4 states that the Turbine Building Ventilation System design should comply with General Design Criteria 2, 5, and 60.

U.S. EPR FSAR Tier 1, Section 4.4, "Interface Requirements", identifies the Turbine Building Design as a site specific structure that is not within the scope of the certified design; therefore the COL Applicant is required to provide the design for the Turbine Building. The design of the Turbine Building also includes supporting systems, such as the Turbine Building Ventilation System (TBVS).

The U.S. EPR FSAR states that the TBVS is non-safety related, has the ability to cool and condition air in the turbine building to maintain temperatures suitable for equipment operation and personnel access, and the system does not provide an accident response or radioactive effluent control functions. The COL applicant needs to provide additional supplemental design information to demonstrate conformance with General Design Criteria 2 and 60. The supplemental information should information identified in SRP 9.4.4, including the piping and instrumentation diagrams (P&IDs), interface requirements, site requirements, system performance requirements, ambient temperature limits for areas serviced, and ITAAC information if applicable.

Response

(A)

The design information related to the Turbine Building Ventilation System is provided in the response to RAI No. 35 Question 09.04.04-1. The design information establishes conformance with SRP 9.4.4. There are no applicable Inspections, Tests, Analyses, Acceptance, and Criteria items associated with the Turbine Building Ventilation System.

COLA Impact

The COLA FSAR will not be revised as a result of this response.