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Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Supplement to Request for License Amendment and Exemption:
Radiologically Controlled Area Ventilation System (VAS) Design Changes (LAR-15-011S1)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, by letter ND-15-1257, dated November 24, 2015 [ADAMS Accession Number ML15328A515], Southern Nuclear Operating Company (SNC), the licensee for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, requested an amendment to Combined License (COL) Numbers NPF-91 and NPF-92, for VEGP Units 3 and 4, respectively. This license amendment request (LAR), LAR-15-011, proposed changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (PS-DCD) Tier 2 information, and involves changes to related Tier 1 information, with corresponding changes to the associated COL Appendix C information. This letter supplements LAR-15-011 to address comments provided by the NRC Staff regarding the relative arrangement of the radiation detectors in the VAS system and clarification on the operation of the VAS system in response to abnormal airborne radiation levels.

Enclosure 4 provides additional information relative to the comments that were provided by the NRC Staff on July 15, 2016 [ADAMS Accession Number ML16197A271] and modified July 20, 2016 [ADAMS Accession Number ML16202A079].

Enclosure 5 provides UFSAR markups which support the discussions in Enclosure 4. Page 2 of Enclosure 5 replaces page 4 of Enclosure 3. Pages 3 and 4 of Enclosure 5 replace Page 5 of Enclosure 3.

The supplemental information provided in Enclosures 4 and 5 does not impact the scope or conclusions of the technical evaluation, regulatory evaluation (including the significant hazards consideration determination), or environmental considerations of the original LAR or exemption request.

This letter contains no regulatory commitments. In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia of this LAR by transmitting a copy of this letter and enclosures to the designated State Official.

Should you have any questions, please contact Mr. Adam Quarles at (205) 992-7031.

Mr. Brian H. Whitley states that: he is the Regulatory Affairs Director of Southern Nuclear Operating Company; he is authorized to execute this oath on behalf of Southern Nuclear Operating Company; and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

Brian H. Whitley

BHW/AGQ/ljs

Sworn to and subscribed before me this 25th *day of* August, *2016*

Notary Public: Lisa Myrick Spears

My commission expires: June 18, 2019

Enclosures: 1) through 3) (previously submitted with the original LAR, LAR-15-011, in SNC letter ND-15-1257)

4) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Response to NRC Staff Comments Regarding the LAR-15-011 Review (LAR-15-011S1)

5) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Supplement to Proposed Changes to Licensing Basis Documents (LAR-15-011S1)

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Southern Nuclear Operating Company

ND-16-1559

Enclosure 4

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Response to NRC Staff Comments Regarding the LAR-15-011 Review

(LAR-15-011S1)

(Enclosure 4 consists of 1 pages, including this cover page.)

The following are comments provided by the NRC Staff regarding the review of Southern Nuclear Operating Company (SNC) License Amendment Request (LAR) 15-011, which was submitted by letter ND-15-1257 on November 24, 2015. The comments are followed by the SNC responses.

NRC Comments:

1. LAR 15-15 [SNC LAR-15-011] contains proposed revisions to UFSAR Figure 9.4.3-1 (Sheet 2 of 3), which include the addition of airborne radiation detector VAS-RE-008 to monitor the exhaust flow from the annex building.

    a. This figure shows dashed lines coming from the exhaust ducting coming from both the annex building (monitored by radiation detector VAS-JE-RE008) and from the portion of the auxiliary building indicated on the lower portion of the figure (monitored by radiation detector VAS-JE-RE002). These dashed lines indicate that a filtered exhaust flowpath is used when radiation in the exhaust ducts is detected. If radiation detector VAS-JE-RE003, which monitors the air coming from the portion of the auxiliary building indicated on the upper portion of Figure 9.4.3-1, is also able to isolate this zone and direct the airflow from this portion of the auxiliary building to the filtered flowpath, then this capability should be clarified on UFSAR Figure 9.4.3-1 (Sheet 2 of 3).

    b. UFSAR Figure 9.4.3-1 (Sheet 2 of 3) shows that the filtered exhaust flowpath line for the annex building and portion of the auxiliary building ties into the exhaust ducting from the annex building upstream of radiation detector VAS-JE-RE008. If high airborne radioactivity from the annex building is detected in the exhaust duct from this zone by radiation detector VAS-JE-RE008, this detector will close the supply and exhaust duct isolation dampers for the annex and auxiliary (upper portion shown on this figure) buildings and reroute this air through the filtered exhaust flowpath shown. In this situation, the exhaust air coming from the portion of the auxiliary building monitored by radiation detector VAS-JE-RE003 will flow past radiation detector VAS-JE-RE003, as well as past radiation detector VAS-JE-RE008, before being routed through the filtered exhaust flowpath line to the containment air filtration exhaust units. If the exhaust air coming from the auxiliary building does not contain high airborne radioactivity, the passage of this uncontaminated air past radiation detector VAS-JE-RE008 could result in the radiation readings from this detector decreasing. Since the readings from radiation detector VAS-JE-RE008 are monitored by operators in the control room, this decrease in the radiation levels measured by this detector could result in some uncertainty regarding the actual radiation levels of the air being exhausted from the annex building.

        UFSAR Figure 9.4.3-1 (sheet 2 of 3) shows that the filtered exhaust flowpath line to the containment air filtration exhaust units for the exhaust air from the portion of the auxiliary building being monitored by radiation detector VAS-JE-RE002 is located downstream of this detector. If the filtered exhaust flowpath line that ties into the exhaust duct from the annex building were to be relocated so that it is downstream of radiation detector VAS-JE-RE008, then this modification would resolve the issue described in the previous paragraph regarding potential misleading readings from radiation detector VAS-JE-RE008 under certain

conditions. Locating radiation detector VAS-JE-RE008 upstream of the filtered exhaust flowpath instead of downstream of the filtered flowpath would also ensure that you would have an accurate indication of the activity of the air from the annex building that is being directed through the filtered exhaust flowpath.

On the basis of the reasons discussed above, justify your reasons for not relocating this filtered exhaust flowpath so that it is located downstream of radiation detector VAS-JE-RE008.

c. The proposed revision to UFSAR Subsection 11.5.2.3.2 states that when a predetermined setpoint is exceeded, indicating abnormal airborne radiation, the auxiliary and annex building exhaust radiation monitors provide signals to alarm in the main control room, to initiate closure of the affected radiologically controlled area ventilation system zone supply and exhaust air isolation dampers, to open the radiologically controlled area ventilation system zone exhaust air isolation damper to the containment air filtration units, and to start a containment air filtration exhaust unit. Please clarify if the isolation of these areas upon high airborne radioactivity is an automatic function or is performed manually. In addition, provide the criteria for resuming normal ventilation flow to these areas.

d. Portions of UFSAR Subsection 9.4.3.2.1.1, Auxiliary/Annex Building Ventilation Subsystem, should be modified to reflect the changes proposed in this LAR. For example, the last sentence in the first paragraph states that a radiation monitor is located in the exhaust air duct from each zone. The proposed LAR would add a second monitor (VAS-JE-RE008) in the exhaust air duct from the auxiliary/annex building ventilation zone.

SNC Response:

1. The following are SNC's responses the NRC comments above:

   a. As described in LAR-15-011, Enclosure 1, Subsection 2.1, the proposed auxiliary building exhaust radiation detector VAS-JE-RE003 monitors a portion of the auxiliary building areas, as shown in the top box of proposed UFSAR Figure 9.4.3-1 (Sheet 2 of 3), and retains its current functions to alarm in the control room, to automatically isolate the zone (UFSAR Subsection 9.4.3.2.1.1), and automatically to start the containment air filtration system when high airborne radioactivity in the exhaust air duct is detected (UFSAR Subsection 9.4.3.2.3.1). In addition, Subsection 2.2 states that the new annex building exhaust radiation detector VAS-JE-RE008 acquires the function to monitor the annex building areas, as shown in the middle box of proposed UFSAR Figure 9.4.3-1 (Sheet 2 of 3), to alarm in the control room, to automatically isolate the associated zone (UFSAR Subsection 9.4.3.2.1.1), and to automatically start the containment air filtration system when high airborne radioactivity in the exhaust air duct is detected (UFSAR Subsection 9.4.3.2.3.1). These areas are a part of a single common associated zone, and the signal to isolate the common normal air supply and exhaust dampers, and to then open the common filtered exhaust damper to the VFS filtered exhaust, is provided from either the renamed and relocated auxiliary building exhaust radiation detector VAS-JE-RE003 or the new annex building exhaust radiation detector VAS-JE-RE008. Therefore, this zone continues to include both the remaining auxiliary building areas not monitored by

auxiliary building exhaust radiation detector VAS-JE-RE002, and the annex building areas; these combined areas are isolated and the exhaust is routed to the VFS filtered exhaust as shown by the dashed line shown on UFSAR Figure 9.4.3-1 (Sheet 2 of 3) upstream of the new annex building exhaust radiation detector VAS-JE-RE008.

Therefore, UFSAR Figure 9.4.3-1 (Sheet 2 of 3) is proposed to be revised to show the two separate zones as follows:

i. The upper two areas containing the auxiliary building areas shown in the upper box of the figure and the annex building areas shown in the middle box of the figure will be shown included in one zone, with the boundaries of this common zone identified. A Note 1 is added for this common zone monitored by proposed auxiliary building exhaust radiation detector VAS-JE-RE003 and the new annex building exhaust radiation detector VAS-JE-RE008 to state: “Either VAS-RE-003 or VAS-RE-008 isolates and aligns this common zone to the VFS filtered exhaust at the boundaries shown.”

ii. The remaining auxiliary building areas shown in the lower box of the figure will be shown as included in the other zone, with the boundaries of this zone identified. A Note 2 is added for this zone monitored by auxiliary building exhaust radiation detector VAS-JE-RE002 to state: “VAS-RE-002 isolates and aligns this zone to the VFS filtered exhaust at the boundaries shown.”

See page 2 of Enclosure 5 for the proposed revision to UFSAR Figure 9.4.3-1 (Sheet 2 of 3).

b. When high airborne radioactivity is detected by either radiation detector VAS-JE-RE003 or VAS-JE-RE008, the direction of the airflow across VAS-JE-RE008 will reverse as the exhaust air is diverted to the VFS filtered exhaust. If the source of the high airborne radioactivity was in the annex building and the reversed flow of air over the radiation detector was then carrying clean air from the auxiliary building, then it would be expected that airborne radioactivity levels detected by VAS-JE-RE008 would decrease. Each radiation detector has a separate alarm in the main control room. Therefore, regardless of what the duct radiation detectors indicate after a high airborne radioactivity signal, abnormal operating procedures developed in accordance with UFSAR Subsection 13.5.2.1 require the operators to notify health physics to perform surveys of the areas monitored by the radiation detector that alarms to determine the source of the high airborne radioactivity that triggered the alarm, and that provided for automatic isolation and VFS filtered exhaust for the affected zone. Plant operators are trained to follow procedures which require the high airborne radioactivity signal from VAS-JE-RE008 and the situation in the annex building to be investigated prior to restoring normal operation of the VAS.

The current position of radiation detector VAS-JE-RE008 allows the operators to more quickly identify the potential areas of the zone to be investigated first by providing two separate alarms for the two areas included in this common zone. If radiation detector VAS-JE-RE008 detects the high airborne radioactivity, and no change is detected by radiation detector VAS-JE-RE003, then the source is the annex building areas shown in the middle box of the proposed UFSAR Figure

9.4.3-1 (Sheet 2 of 3). If radiation detector VAS-JE-RE003 detects the high airborne radioactivity, then the source is the auxiliary building areas shown in the upper box of the proposed UFSAR Figure 9.4.3-1 (Sheet 2 of 3). Therefore, high airborne radioactivity levels detected by both radiation detector VAS-JE-RE003 and radiation detector VAS-JE-RE008 would be expected to remain high if the source is one or more of the auxiliary building areas in this common zone, and normal VAS supply and exhaust operation could not be manually restored by the operator until the high airborne radioactivity signal clears. It should be noted that the annex building areas monitored by radiation detector VAS-JE-RE008 are less likely to be the source of high airborne radioactivity compared to the auxiliary building areas monitored by radiation detector VAS-JE-RE003 where equipment, tanks, and piping that contain larger amounts of radioactive materials exist. Therefore, the current position of radiation detector VAS-JE-RE008 is sufficient.

It is also worth noting that upon a high airborne radioactivity signal from either radiation detector VAS-JE-RE003 or VAS-JE-RE008, the VAS supply and exhaust fan for that zone are automatically stopped. These fans do not restart automatically once the high airborne radioactivity signal has cleared. As previously stated, regardless of what the duct radiation detectors indicate after a high airborne radioactivity signal, abnormal operating procedures developed in accordance with UFSAR Subsection 13.5.2.1 require the operators to notify health physics to perform surveys of the areas monitored by the radiation detector that alarms to determine the source of the high airborne radioactivity that triggered the alarm prior to restarting the supply and exhaust fans for that zone.

Relocating VAS-JE-RE008 upstream of the branch ductwork that directs air to the VFS filtered exhaust is not a viable design option. Doing this would create the need for additional radiation monitoring equipment and alarm and control signals without gaining any benefits to the health and safety of plant personnel or the general public. The configuration of the VAS exhaust ductwork contains branch duct L241 between the current location of VAS-JE-RE008 and the VFS filtered exhaust duct take-off. If VAS-JE-RE008 was moved from its current location, there would not be a radiation detector in the airflow path to detect radiation in the air being exhausted via L241. Therefore, a new radiation detector would then need to be located in this exhaust ductwork in order to monitor all exhaust air. VAS-JE-RE008 is also located a considerable distance from the branch duct that diverts air to the VFS filtered exhaust. Relocating the branch duct so that it is downstream of the current location of VAS-JE-RE008 would require a significant amount of new ductwork and supports to get the exhaust air back to the VFS filtered exhaust. Because there would be no measurable increase in level of safety by moving VAS-JE-RE008, and because it would require substantial rework of the design, the current position of radiation detector VAS-JE-RE008 remains sufficient and need not be moved.

Based on the above clarifications, no changes to the LAR are proposed.

c. UFSAR Subsection 11.5.2.3.2 is proposed to be revised as requested to identify that the isolation of these areas upon high airborne radioactivity is an automatic function. In addition, the criteria for resuming normal ventilation flow to these areas are also addressed.

See pages 3 and 4 of Enclosure 5 for the proposed revision to UFSAR Subsection 11.5.2.3.2.

d. UFSAR Subsection 9.4.3.2.1.1 is proposed to be revised to state the number and relative location of the radiation detectors for each zone.

   See page 5 of Enclosure 5 for the proposed revision to UFSAR Subsection 9.4.3.2.1.1.

Southern Nuclear Operating Company

ND-16-1559

Enclosure 5

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Supplement to Proposed Changes to Licensing Basis Documents

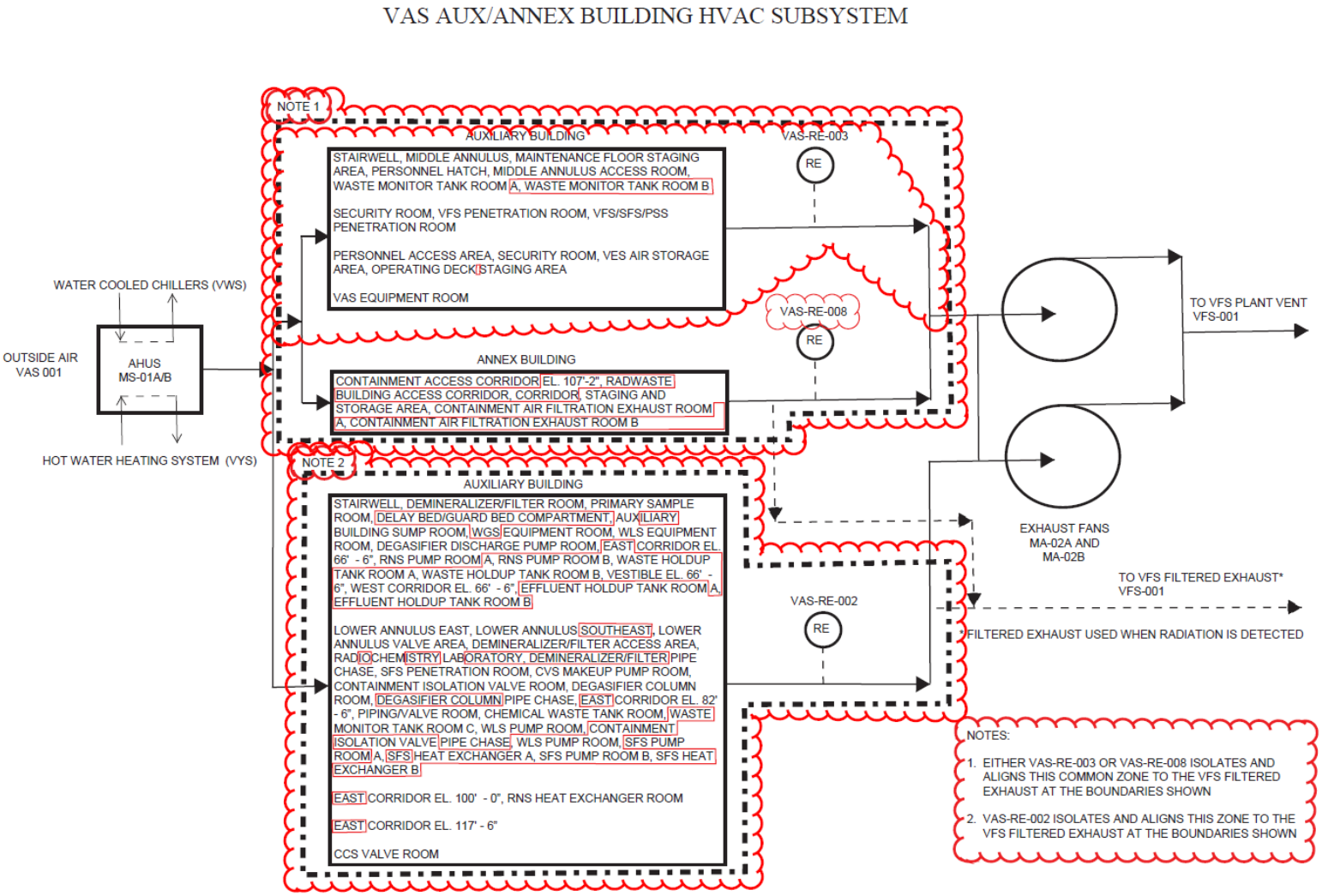
(LAR-15-011S1)

Insertions Denoted by Blue Underline and Deletions by Red Strikethrough

(Enclosure 5 consists of 5 pages, including this cover page.)

UFSAR Figure 9.4.3-1 (Sheet 2 of 3) Radiologically Controlled Area Ventilation System Piping and Instrumentation Diagram (REF) VAS 003 & 010

Revise Figure as shown below. This markup replaces page 4 of Enclosure 3 of LAR-15-011.



UFSAR Subsection 11.5.2.3.2 Airborne Monitors paragraphs under heading Auxiliary Building Exhaust Radiation Monitor and first two paragraphs under heading Annex Building Exhaust Radiation Monitor

Revise text as shown below. This markup replaces page 5 of Enclosure 3 of LAR-15-011.

Auxiliary Building Exhaust Radiation Monitor

The auxiliary building exhaust radiation monitor**s** (VAS-JE-RE002 **and VAS-JE-RE003**) measure~~s~~ the concentration of radioactive materials in the radiologically controlled area ventilation system exhaust air from the auxiliary building. The auxiliary building radiation monitor detector**s are** ~~is~~ upstream of the exhaust air isolation damper.

When a predetermined setpoint is exceeded, indicating abnormal airborne radiation, the auxiliary building exhaust radiation monitor**s** provide~~s~~ signals to alarm in the main control room, to initiate **automatic** closure of the **affected radiologically controlled area ventilation system zone** ~~auxiliary building~~ supply and exhaust air isolation dampers, to **automatically** open the ~~auxiliary building~~ **radiologically controlled area ventilation system zone** exhaust air isolation damper to the containment air filtration exhaust units, and to **automatically** start a containment air filtration exhaust unit. These actions provide a filtered air path from the ~~auxiliary building~~ **affected radiologically controlled area ventilation system zone** to the plant vent. **Once automatically closed, the zone supply and exhaust air isolation dampers do not automatically reopen and can only be opened manually when airborne radioactivity levels decrease to below the predetermined setpoint of the affected radiation monitor. The operators only restore normal zone supply and exhaust operation after determining and correcting the source of abnormal airborne radioactivity in the affected zone.** Refer to Subsection 9.4.3 for system details.

The auxiliary building exhaust radiation monitor**s are** ~~is an~~ inline monitor**s** that use~~s~~ a beta-sensitive scintillation detector. ~~It is~~ **The detectors are** located with the sensitive volume inside the exhaust duct. The range and principal isotopes are listed in Table 11.5-1.

The arrangement for the auxiliary building exhaust radiation monitor**s are** ~~is~~ shown in Figure 11.5-5.

Annex Building Exhaust Radiation Monitor

The annex building exhaust radiation monitor (VAS-JE-~~RE003~~**RE008**) measures the concentration of radioactive materials in the radiologically controlled area ventilation system exhaust air from the annex building. The annex building exhaust radiation monitor is located upstream of the annex building exhaust air isolation damper.

When a predetermined setpoint is exceeded, indicating abnormal airborne radiation, the annex building exhaust radiation monitor provides signals to alarm in the main control room, to initiate **automatic** closure of the ~~annex building~~ **affected radiologically controlled area ventilation system zone** supply and exhaust air isolation dampers, to **automatically** open

the ~~annex building~~ **radiologically controlled area ventilation system zone** exhaust air isolation damper to the containment air filtration units, and to **automatically** start a containment air filtration exhaust unit. These actions provide a filtered air path from the ~~annex building~~ **affected radiologically controlled area ventilation system zone** to the plant vent. **Once automatically closed, the zone supply and exhaust air isolation dampers do not automatically reopen and can only be opened manually when airborne radioactivity levels decrease to below the predetermined setpoint of the affected radiation monitor. The operators only restore normal zone supply and exhaust operation after determining and correcting the source of abnormal airborne radioactivity in the affected zone.** Refer to Subsection 9.4.3 for system details.

UFSAR Subsection 9.4.3.2.1.1 first paragraph under heading Auxiliary/Annex Building Ventilation Subsystem

Revise text as shown below:

9.4.3.2.1.1 Auxiliary/Annex Building Ventilation Subsystem

The auxiliary/annex building ventilation subsystem serves radiologically controlled equipment, piping and valve rooms and adjacent access and staging areas. See Figure 9.4.3-1, sheet 2 of 3, for a complete listing of rooms and corridors serviced by this subsystem. The auxiliary/annex building ventilation subsystem consists of two 50 percent capacity supply air handling units of about 18,000 scfm each, a ducted supply and exhaust air system, isolation dampers, diffusers and registers, exhaust fans, automatic controls and accessories. The supply air handling units are located in the south air handling equipment room of the annex building at elevation 158′-0″. They are connected to the air intake plenum #3 located in the extreme south end of the annex building. This common intake plenum is described in Subsection 9.4.7. The units discharge into a ducted supply distribution system which is routed through the radiologically controlled areas of the auxiliary and annex buildings. The supply and exhaust ducts have isolation dampers that close to isolate the auxiliary and annex buildings from the outside environment when high airborne radioactivity is detected in the exhaust air duct. The supply and exhaust ducts are configured so that two building zones may be independently isolated. The annex building staging and storage area, containment air filtration exhaust rooms, containment access corridor, and adjacent auxiliary building staging, equipment areas, middle annulus, middle annulus access room, and security rooms are aligned to one zone. **A radiation monitor is located in the exhaust air duct from the annex building areas in this zone, and a second radiation monitor is located in the exhaust air duct from the auxiliary building areas in this zone.** The other zone includes the remaining rooms and corridors shown in Figure 9.4.3-1 sheet 2 of 3, including but not limited to the radiation chemistry laboratory, primary sample room, spent fuel pool cooling water pump and heat exchanger rooms, normal residual heat removal pump and heat exchanger rooms, CVS makeup pump room, lower annulus, and various radwaste equipment rooms, pipe chases, and access corridors. A radiation monitor is located in the exhaust air duct from ~~each~~ **this** zone.