

## B 3.7 PLANT SYSTEMS

### B 3.7.11 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)

#### BASES

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**BACKGROUND**      The ABFVES filters air from the area of the active ECCS components during the recirculation phase of a loss of coolant accident (LOCA). The ABFVES, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the ECCS pump room area and the auxiliary building.

The ABFVES consists of a system, made up of prefilter, a high efficiency particulate air (HEPA) filter, a carbon adsorber section for removal of gaseous activity (principally iodines), and two fans. Ductwork, valves or dampers, and instrumentation also form part of the system. The system initiates filtered ventilation of the pump room following receipt of a safety injection (SI) signal.

The ABFVE systems are designed to be shared between units. Each unit's system is constructed with two 50% capacity fans providing flow to a 100% capacity filter package. With this design, both Units 1's and Units 2's ABFVE systems are required to be OPERABLE with either unit in MODES 1, 2, 3, or 4.

The ABFVES is a standby system, aligned to bypass the system HEPA filters and carbon adsorbers. During emergency operations, the ABFVES dampers are realigned to begin filtration. Upon receipt of the actuating Engineered Safety Feature Actuation System signal(s), air is pulled from the mechanical penetration area and the ECCS pump rooms, and the stream of ventilation air discharges through the system filters. The prefilters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and carbon adsorbers.

The ABFVES was not initially designed as a safety related system. However, during initial plant licensing, the ABFVES was re-classified as an engineered safety feature (ESF) atmosphere cleanup system and partially upgraded to meet most of the recommendations of Regulatory Guide 1.52. A comparison of the current ABFVES design to Regulatory Guide 1.52 (Ref. 6) is presented in UFSAR Table 9-38 (Ref. 8) and is discussed in UFSAR Section 9.4 (Ref. 1).

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### BACKGROUND (Continued)

The ABFVES is discussed in the UFSAR, Sections 9.4, 12.2, and 15.6.5 (Refs. 1, 2, and 3, respectively) since it may be used for normal, as well as post accident, atmospheric cleanup functions.

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### APPLICABLE SAFETY ANALYSES

The design basis of the ABFVES is established by the large break LOCA. The system evaluation assumes a passive failure of the ECCS outside containment, such as an SI pump seal failure, during the recirculation mode. In such a case, the system limits radioactive release to within the 10 CFR 50.67 (Ref. 4) limits, or the NRC staff approved licensing basis (e.g., a specified fraction of Reference 4 limits). The analysis of the effects and consequences of a large break LOCA is presented in Reference 3. The ABFVES also actuates following a small break LOCA, in those cases where the ECCS goes into the recirculation mode of long term cooling, to clean up releases of smaller leaks, such as from valve stem packing.

Two types of system failures are considered in the accident analysis: complete loss of function, and excessive LEAKAGE. Either type of failure may result in a lower efficiency of removal for any gaseous and particulate activity released to the ECCS pump rooms following a LOCA.

The ABFVES satisfies Criterion 3 of 10 CFR 50.36 (Ref. 5).

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### LCO

The ABFVES is required to be OPERABLE with either unit in MODES 1, 2, 3, or 4. Total system failure could result in the atmospheric release from the ECCS pump room exceeding 10 CFR 50.67 limits in the event of a Design Basis Accident (DBA).

ABFVES is considered OPERABLE when the individual components necessary to maintain the ECCS pump room filtration are OPERABLE in both units systems.

An ABFVES is considered OPERABLE when its associated:

a. Fans in configuration as described below are OPERABLE:

Both fans OPERABLE in any one set of fans listed below:

- 1A and 1B, or
  - 2A and 2B, or
  - 1A and 2A, or
  - 1B and 2B
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### LCO (continued)

Use of any other two fan combination requires surveillance testing in that configuration prior to taking credit for that combination.

- b. HEPA filter and carbon adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and
- c. Ductwork, valves, and dampers are OPERABLE and air circulation can be maintained.

The ABFVES is shared between the two units. The system must be OPERABLE for each unit when that unit is in the MODE of Applicability. Additionally, both normal and emergency power must also be OPERABLE because the system is shared. If a ABFVES component becomes inoperable, or normal or emergency power to a ABFVES component becomes inoperable, then the Required Actions of this LCO must be entered independently for each unit that is in the MODE of applicability of the LCO.

The LCO is modified by a NOTE allowing the Auxiliary Building pressure boundary to be opened intermittently under administrative controls. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for Auxiliary Building pressure boundary isolation is indicated.

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### APPLICABILITY

Either unit in MODES 1, 2, 3, and 4, the ABFVES is required to be OPERABLE consistent with the OPERABILITY requirements of the ECCS.

Both units in MODE 5 or 6, the ABFVES is not required to be OPERABLE since the ECCS is not required to be OPERABLE.

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### ACTIONS

#### A.1

With one unit's ABFVES inoperable, action must be taken to restore OPERABLE status within 7 days. During this time, the

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### ACTIONS (continued)

remaining OPERABLE unit's system is adequate to perform the ABFVES function. One unit's system of ABFVES may be made inoperable from, but not limited to, the filter assembly, fans, flowpath, or the ability to maintain the required negative 0.125 inches of water gauge (wg) for the ECCS pump rooms relative to atmospheric pressure.

The 7 day Completion Time is appropriate because the risk contribution is less than that for the ECCS (72 hour Completion Time), and this system is not a direct support system for the ECCS. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining unit's system to provide the required capability.

#### B.1

With both unit's ABFVE systems inoperable, action must be taken to restore to OPERABLE status one unit's ABFVE system within 24 hours. The 24 hour Completion Time is based on an adequate period of time to determine the cause of the inoperability and affect repairs without the need of shutting down both units. In addition, the probability of a DBA is low for this short period of time.

If the Auxiliary Building pressure boundary is inoperable such that the ABFVES trains cannot establish or maintain the required pressure, action must be taken to restore an OPERABLE Auxiliary Building pressure boundary within 24 hours. During the period that the Auxiliary Building pressure boundary is inoperable, appropriate compensatory measures [consistent with the intent, as applicable, of GDC 19, 60, 64 and 10 CFR Part 50.67] should be utilized to protect plant personnel from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition.

#### C.1 and C.2

If the ABFVES cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable,

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ACTIONS (continued)

based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Systems without heaters need only be operated from the control room for  $\geq 15$  minutes with flow through the HEPA filters and charcoal adsorbers to demonstrate the function of the system. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.11.2

This SR verifies that the required ABFVES testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The ABFVES filter tests are in accordance with Reference 4. The VFTP includes testing HEPA filter performance, carbon adsorbers efficiency, minimum system flow rate, and the physical properties of the carbon (general use and following specific operations).

Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies that ABFVES starts and operates with flow through the HEPA filters and charcoal adsorbers on an actual or simulated actuation signal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.11.4

This SR verifies the integrity of the ECCS pump room enclosure. The ability of the ECCS pump room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper functioning of the ABFVES. During the post accident mode of operation, the ABFVES is designed to maintain a slight negative pressure in the

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### SURVEILLANCE REQUIREMENTS (continued)

ECCS pump room area, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The ABFVES is designed to maintain a  $\leq -0.125$  inches water gauge relative to atmospheric pressure. This SR is required to be performed for each fan combination (1A and 1B, 2A and 2B, 1A and 2A, 1B and 2B) described in the LCO Bases. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

### REFERENCES

1. UFSAR, Section 9.4.
2. UFSAR, Section 12.2.
3. UFSAR, Section 15.6.5.
4. 10 CFR 50.67, "Accident Source Term."
5. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
6. Regulatory Guide 1.52 (Rev. 2).
7. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.
8. UFSAR, Table 9-38.