
BASES

B 3.7 PLANT SYSTEMS

B 3.7.12 Fuel Handling Ventilation Exhaust System (FHVES)

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BACKGROUND

The FHVES filters airborne radioactive particulates from the area of the fuel pool following a fuel handling accident. The FHVES, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the fuel pool area.

The FHVES is composed of both a supply and exhaust section. The supply portion consists of a 100% capacity air handling unit containing water cooling coils, hot water heating coils, roughing filters, and associated ductwork and dampers. The exhaust portion consists of a 100% capacity filter train, two 50% capacity exhaust fans, and associated ductwork and dampers. The exhaust fans were originally each 100% capacity but have been modified to 50% capacity fans in order to meet the required intake and exhaust flowrate. The filter train contains a prefilter, high efficiency particulate air (HEPA) filter, and carbon filters of the gasketless design. The system is required to be in operation in filtered mode any time irradiated fuel is being moved in the fuel handling building.

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 FHVES is discussed in the UFSAR, Sections 9.4 and 15.7 (Refs. 1 and 2 respectively) because it may be used for normal, as well as post accident, atmospheric cleanup functions.

A fuel handling accident can occur as a result of either dropping an irradiated fuel assembly that is being moved, or by dropping other equipment onto an irradiated fuel assembly in storage. As such, the FHVES is required to be OPERABLE and in operation in filtered mode to alleviate the consequences of a fuel handling accident during the following evolutions:

1. Movement of irradiated fuel in the fuel handling building;
2. Movement of loads in excess of 100 lbs. over irradiated fuel in the fuel handling building. This can include equipment and/or

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BACKGROUND (continued)

new fuel assemblies that are being moved over irradiated fuel stored in the fuel pool; and

3. Movement of a loaded dry storage cask in the fuel handling building with the 125 ton overhead crane. This specifically excludes the movement of a loaded cask into or out of the fuel handling building when the fuel handling building roll-up door is raised.

APPLICABLE SAFETY ANALYSES The FHVES design basis is established by the consequences of the limiting Design Basis Accident (DBA), which is a fuel handling accident. The analysis of the fuel handling accident, given in Reference 2, assumes that all fuel rods in an assembly are damaged. The DBA analysis of the fuel handling accident assumes that the FHVES is in operation in filtered mode. The accident analysis accounts for the reduction in airborne radioactive material provided by this filtration system. The amount of fission products available for release from the fuel handling building is determined for a fuel handling accident. These assumptions and the analysis follow the guidance provided in Regulatory Guide 1.25 (Ref. 3).

The FHVES satisfies Criterion 3 of 10 CFR 50.36 (Ref. 4).

LCO The FHVES is required to be OPERABLE and in operation in filtered mode when irradiated fuel is being handled in the fuel handling building. Total system failure could result in the atmospheric release from the fuel handling building exceeding the 10 CFR 100 (Ref. 5) limits in the event of a fuel handling accident.

The FHVES is considered OPERABLE when the individual components necessary to control exposure in the fuel handling building are OPERABLE. The FHVES is considered OPERABLE when its associated:

- a. Two exhaust fans are OPERABLE;
 - b. Supply fan is OPERABLE;
 - c. HEPA filter and carbon adsorber are not excessively restricting flow, and are capable of performing their filtration function; and
 - d. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.
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APPLICABILITY The FHVES is required to be OPERABLE and in operation in filtered mode during the following evolutions:

1. Movement of irradiated fuel in the fuel handling building;
 2. Movement of loads in excess of 100 lbs. over irradiated fuel stored in the spent fuel pool; and
 3. Movement of a loaded dry storage cask in the fuel handling building with the 125 ton overhead crane.
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ACTIONS A.1

With the FHVES inoperable, action must be taken to immediately suspend the movement of irradiated fuel in the fuel handling building. This does not preclude movement of a fuel assembly to a safe position. This action ensures a release to the environment will be within the limits of 10 CFR 100 limits (Ref. 5), if a fuel handling accident were to occur. Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

SURVEILLANCE
REQUIREMENTS SR 3.7.12.1

With the FHVES in service, a periodic monitoring of the system for proper operation is required to ensure that the system functions properly. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.12.2

Systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing prior to movement of irradiated fuel will ensure an adequate check on this system.

Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.

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SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.3

This SR verifies that the required FHVES testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The FHVES filter tests are in accordance with Regulatory Guide 1.52 (Ref. 6). The VFTP includes testing HEPA filter performance, carbon adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.4

This SR verifies the integrity of the fuel building enclosure. The ability of the fuel building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically verified by ensuring the exhaust flow rate of the FHVES is 8000 cfm greater than the supply flow rate. During the post accident mode of operation, the FHVES is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered LEAKAGE.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.12.5

Operating the FHVES filter bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the FHVES filter bypass damper is verified if it can be manually closed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

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- REFERENCES
1. UFSAR, Section 9.4.
 2. UFSAR, Section 15.7.
 3. Regulatory Guide 1.25.
 4. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
 5. 10 CFR 100.
 6. Regulatory Guide 1.52 (Rev. 2).
 7. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.