

## LIMITING CONDITIONS FOR OPERATION

### 3.7 CONTAINMENT SYSTEMS (Cont)

#### A. Primary Containment (Cont)

##### 7. Containment Atmosphere Dilution

- a. Within the 24-hour period after placing the reactor in the Run Mode the Post - LOCA Containment Atmosphere Dilution System must be operable and capable of supplying nitrogen to the containment for atmosphere dilution. If this specification cannot be met, the system must be restored to an operable condition within 30 days or the reactor must be at least in Hot Shutdown within 12 hours.
- b. Within the 24-hour period after placing the reactor in the Run Mode, the Nitrogen Storage Tank shall contain a minimum of 1500 gallons of liquid N<sub>2</sub>. If this specification cannot be met the minimum volume will be restored within 30 days or the reactor must be in at least Hot Shutdown within 12 hours.

## SURVEILLANCE REQUIREMENTS

### 4.7 CONTAINMENT SYSTEMS (Cont)

#### A. Primary Containment (Cont)

##### 7. Containment Atmosphere Dilution

- a. The post-LOCA containment atmosphere dilution system shall be functionally tested once per operating cycle.
- b. The level in the liquid N<sub>2</sub> storage tank shall be recorded weekly.
- c. Not used.
- d. Once per month each manual or power operated valve in the CAD system flow path not locked, sealed or otherwise secured in position shall be observed and recorded to be in its correct position.

## LIMITING CONDITIONS FOR OPERATION

### 3.7 CONTAINMENT SYSTEMS (Cont.)

#### B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System

##### 1. Standby Gas Treatment System

- a. Except as specified in 3.7.B.1.c or 3.7.B.1.e below, both trains of the standby gas treatment shall be operable when in the Run, Startup, and Hot Shutdown MODES, during movement of irradiated fuel assemblies in the secondary containment, and during movement of new fuel over the spent fuel pool, and during **CORE ALTERATIONS**, and during operations with a potential for draining the reactor vessel (OPDRVs),

or

the reactor shall be in cold shutdown within the next 36 hours.

- b. 1. The results of the in-place cold DOP tests on HEPA filters shall show  $\geq 99\%$  DOP removal. The results of halogenated hydrocarbon tests on charcoal adsorber banks shall show  $\geq 99.9\%$  halogenated hydrocarbon removal.

## SURVEILLANCE REQUIREMENTS

### 4.7 CONTAINMENT SYSTEMS (Cont.)

#### B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System

##### 1. Standby Gas Treatment System

- a. 1. At least once per operating cycle, it shall be demonstrated that pressure drop across the combined high efficiency filters and charcoal adsorber banks is less than 8 inches of water at 4000 cfm.
2. At least once per operating cycle, demonstrate that the inlet heaters on each train are operable and are capable of an output of at least 20 kW.
3. The tests and analysis of Specification 3.7.B.1.b. shall be performed at least once per operating cycle or following painting, fire or chemical release in any ventilation zone communicating with the system while the system is operating that could contaminate the HEPA filters or charcoal adsorbers.
4. At least once per operating cycle, automatic initiation of

## BASES:

### 3/4.7 CONTAINMENT SYSTEMS (Cont)

#### A. Primary Containment (Cont)

wetwell pressure differential to keep the suppression chamber downcomer legs clear of water significantly reduced suppression chamber post LOCA hydrodynamic loads. A pressure of 1.17 psid is required to sufficiently clear the water legs of the downcomers without bubbling nitrogen into the suppression chamber at the 3.00 ft. downcomer submergence which corresponds to approximately 84,000 ft.<sup>3</sup> of water. Maximum downcomer submergence is 3.25 ft. at operating suppression chamber water level. The above pressure differential and submergence number are used in the Pilgrim I Plant Unique Analysis.

#### Post LOCA Atmosphere Dilution

In order to ensure that the containment atmosphere remains inerted, i.e. the oxygen-hydrogen mixture below the flammable limit, the capability to inject nitrogen into the containment after a LOCA is provided. A minimum of 1500 gallons of liquid N<sub>2</sub> in the storage tank assures that a three-day supply of N<sub>2</sub> for post-LOCA containment inerting is available. Since the inerting makeup system is continually functioning, no periodic testing of the system is required.

The Post-LOCA Containment Atmospheric Dilution (CAD) System is designed to meet the requirements of AEC Regulatory Guides 1.3, 1.7 and 1.29, ASME Section III, Class 2 (except for code stamping) and seismic Class I as defined in the PNPS FSAR.

In summary, the limiting criteria are:

1. Maintain hydrogen concentration in the containment during post-LOCA conditions to less than 4%.
2. Limit the buildup in the containment pressure due to nitrogen addition to less than 28 psig.
3. To limit the offsite dose due to containment venting (for pressure control) to less than 300 Rem to the thyroid.

By maintaining at least a 3-day supply of N<sub>2</sub> on site there will be sufficient time after the occurrence of a LOCA for obtaining additional nitrogen supply from local commercial sources. <sup>(1)</sup> The system design contains sufficient redundancy to ensure its reliability. Thus, it is sufficient to test the operability of the whole system once per operating cycle.

- (1) As listed in Pilgrim Nuclear Power Station Procedure No. 5.4.6 "Post Accident Venting".

## **BASES:**

### **3/4.7 CONTAINMENT SYSTEMS (Cont)**

Due to nitrogen addition, the pressure in the containment after a LOCA will increase with time. Under the worst expected conditions the containment pressure will reach 28 psig in approximately 45 days. If and when that pressure is reached, venting from the containment shall be manually initiated per the requirements of 10CFR50.44. The venting path will be through the Standby Gas Treatment system in order to minimize the off site dose.

#### **B.1 Standby Gas Treatment System**

The Standby Gas Treatment System is designed to filter and exhaust the reactor building atmosphere to the stack during secondary containment isolation conditions. Upon containment isolation, both standby gas treatment fans are designed to start to bring the reactor building pressure negative so that all leakage should be in leakage. After a preset time delay, the standby fan automatically shuts down so the reactor building pressure is maintained approximately 1/4 inch of water negative. Should one system fail to start, the redundant system is designed to start automatically. Each of the two trains has 100% capacity.

High Efficiency Particulate Air (HEPA) filters are installed before and after the charcoal adsorbers to minimize potential release of particulates to the environment and to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA filter efficiency of at least 99 percent removal of cold DOP particulates. The laboratory carbon sample test results should indicate a methyl iodide removal efficiency of at least 95 percent for expected accident conditions. The specified efficiencies for the charcoal and particulate filters is sufficient to preclude exceeding 10CFR100 guidelines for the accidents analyzed. The analysis of the loss of coolant accident assumed a charcoal adsorber efficiency of 95% and TID 14844 fission product source terms, hence, installing two banks of adsorbers and filters in each train provides adequate margin. A 20 kW heater maintains relative humidity below 70% in order to ensure the efficient removal of methyl iodide on the impregnated charcoal adsorbers. Considering the relative simplicity of the heating circuit, the test frequency of once/operating cycle is adequate to demonstrate operability.

Air flow through the filters and charcoal adsorbers for 15 minutes each month assures operability of the system. Since the system heaters are automatically controlled, the air flowing through the filters and adsorbers will be  $\leq 70\%$  relative humidity and will have the desired drying effect.