LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

1. Except as specified in Specification 3.7.B.3 below, all three trains of the standby gas treatment system shall be OPERABLE at all times when secondary containment integrity is required.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

1. At least once per year, the following conditions shall be demonstrated.

   a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at a flow of 9000 cfm (± 10%).

   b. The inlet heaters on each circuit are tested in accordance with ANSI N510-1975, and are capable of an output of at least 40 kW.

   c. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers.

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LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3. From and after the date that one train of the standby gas treatment system is made or found to be inoperable for any reason, REACTOR POWER OPERATION and fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE, provided that during such 7 days all active components of the other two standby gas treatment trains shall be operable.

4. If these conditions cannot be met:

a. suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.B.2 (Cont'd)

d. Each train shall be operated a total of at least 10 hours every month.

e. Test sealing of gaskets for housing doorsh shall be performed utilizing chemical smoke generators during each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3.a. Once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated from each unit's controls.

b. At least once per year manual operability of the bypass valve for filter cooling shall be demonstrated.

c. When one train of the standby gas treatment system becomes inoperable the other two trains shall be demonstrated to be OPERABLE within 2 hours and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3.7.B.4 (Cont'd)

b. Place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours.

3.7.C. Secondary Containment

1. Secondary containment integrity shall be maintained in the reactor zone at all times except as specified in 3.7.C.2.

2. If reactor zone secondary containment integrity cannot be maintained the following conditions shall be met:

   a. Suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

   b. Restore reactor zone secondary containment integrity within 4 hours, or place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours.

3. Secondary containment integrity shall be maintained in the refueling zone, except as specified in 3.7.C.4.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.C. Secondary Containment

1. Secondary containment surveillance shall be performed as indicated below:

   a. Secondary containment capability to maintain 1/4 inch of water vacuum under calm wind (< 5 mph) conditions with a system leakage rate of not more than 12,000 cfm, shall be demonstrated at each refueling outage prior to refueling.

2. After a secondary containment violation is determined, the standby gas treatment system will be operated immediately after the affected zones are isolated from the remainder of the secondary containment to confirm its ability to maintain the remainder of the secondary containment at 1/4-inch of water negative pressure under calm wind conditions.

LIMITING CONDITIONS FOR OPERATION

3.7.C. Secondary Containment

4. If refueling zone secondary containment cannot be maintained the following conditions shall be met:

   a. Handling of spent fuel and all operations over spent fuel pools and open reactor wells containing fuel shall be prohibited.

   b. The standby gas treatment system suction to the refueling zone will be blocked except for a controlled leakage area sized to assure the achieving of a vacuum of at least 1/4-inch of water and not over 3 inches of water in all three reactor zones. This is only applicable if reactor zone integrity is required.

D. Primary Containment Isolation Valves

1. When Primary Containment Integrity is required, all isolation valves listed in Table 3.7.A and all reactor coolant system instrument line flow check valves shall be OPERABLE except as specified in 3.7.D.2.

SURVEILLANCE REQUIREMENTS

D. Primary Containment Isolation Valves

1. The primary containment isolation valves surveillance shall be performed as follows:

   a. At least once per operating cycle, the OPERABLE isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and in accordance with Specification 1.0.MM, tested for closure times.

The primary containment leak rate test frequency is based on maintaining adequate assurance that the leak rate remains within the specification. The leak rate test frequency is based on the NRC guide for developing leak rate testing and surveillance of reactor containment vessels. Allowing the test intervals to be extended up to 10 months permits some flexibility needed to have the tests coincide with scheduled or unscheduled shutdown periods.

The penetration and air purge piping leakage test frequency, along with the containment leak rate tests, is adequate to allow detection of leakage trends. Whenever a bolted double-gasketed penetration is broken and remade, the space between the gaskets is pressurized to determine that the seals are performing properly. It is expected that the majority of the leakage from valves, penetrations and seals would be into the reactor building. However, it is possible that leakage into other parts of the facility could occur. Such leakage paths that may affect significantly the consequences of accidents are to be minimized.

The primary containment is normally slightly pressurized during period of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, determining the oxygen concentration twice a week serves as an added assurance that the oxygen concentration will not exceed 4 percent.

3.7.B/3.7.C Standby Gas Treatment System and Secondary Containment

The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The reactor building provides secondary containment during reactor operation, when the drywell is sealed and in service; the reactor building provides primary containment, if required, when the reactor is shutdown and the drywell is open. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required as well as during refueling.

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the stack during secondary containment isolation conditions. All three standby gas treatment system fans are designed to automatically start upon containment isolation and to maintain the reactor building pressure to the design negative pressure so that all leakage should be in-leakage.

High efficiency particulate air (HEPA) filters are installed before and after the charcoal absorbers to minimize potential release of particulates to the environment and to prevent clogging of the iodine absorbers. The charcoal absorbers 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 absorbers and a HEPA efficiency of at least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal absorbers are as specified, the resulting doses will be less than the 10 CFR 100 guidelines for the accidents analyzed. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal absorbers.

Only two of the three standby gas treatment systems are needed to clean up the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is no immediate threat to the containment system performance and reactor operation or refueling operation may continue while repairs are being made. If more than one train is inoperable, all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel must be suspended and all reactors placed in a cold shutdown condition, because the remaining train would provide only 50 percent of the capacity required to filter and exhaust the reactor building atmosphere to the stack. Suspension of these activities shall not preclude movement of a component to a safe, conservative position. Operations that have the potential for draining the reactor vessel must be suspended as soon as practical to minimize the probability of a vessel draindown and subsequent potential for fission product release. Draindown of a reactor vessel containing no fuel does not present the possibility for fuel damage or significant fission product release and therefore is not a nuclear safety concern.

4.7.B/4.7.C Standby Gas Treatment System and Secondary Containment

Initiating reactor building isolation and operation of the standby gas treatment system to maintain at least a 1/4 inch of water vacuum within the secondary containment provides an adequate test of the operation of the reactor building isolation valves, leak tightness of the reactor building and performance of the standby gas treatment system. Functionally testing the initiating sensors and associated trip logic demonstrates the capability for automatic actuation. Performing these tests prior to refueling will demonstrate secondary containment capability prior to the time the primary containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after two years of operation in the rugged shipboard environment on the US Savannah (ORNL 3726). Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Heater capability, pressure drop and air distribution should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant shall be performed in accordance with USAEC Report DP-1082. Iodine removal efficiency tests shall follow ASTM D3803. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

1. Except as specified in Specification 3.7.B.3 below, all three trains of the standby gas treatment system shall be OPERABLE at all times when secondary containment integrity is required.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

1. At least once per year, the following conditions shall be demonstrated.

   a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at a flow of 9000 cfm (± 10%).

   b. The inlet heaters on each circuit are tested in accordance with ANSI N510-1975, and are capable of an output of at least 40 kW.

   c. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3. From and after the date that one train of the standby gas treatment system is made or found to be inoperable for any reason, REACTOR POWER OPERATION and fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE, provided that during such 7 days all active components of the other two standby gas treatment trains shall be OPERABLE.

4. If these conditions cannot be met:

   a. Suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.B.2 (Cont'd)

d. Each train shall be operated a total of at least 10 hours every month.

e. Test sealing of gaskets for housing doors shall be performed utilizing chemical smoke generators during each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3. a. Once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated from each unit's controls.

   b. At least once per year manual operability of the bypass valve for filter cooling shall be demonstrated.

   c. When one train of the standby gas treatment system becomes inoperable the other two trains shall be demonstrated to be OPERABLE within 2 hours and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3.7.B.4 (Cont'd)

b. Place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours.

3.7.C. Secondary Containment

1. Secondary containment integrity shall be maintained in the reactor zone at all times except as specified in 3.7.C.2.

2. If reactor zone secondary containment integrity cannot be maintained the following conditions shall be met:

   a. Suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

   b. Restore reactor zone secondary containment integrity within 4 hours, or place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours.

3. Secondary containment integrity shall be maintained in the refueling zone, except as specified in 3.7.C.4.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.C. Secondary Containment

1. Secondary containment surveillance shall be performed as indicated below:

   a. Secondary containment capability to maintain 1/4 inch of water vacuum under calm wind (< 5 mph) conditions with a system leakage rate of not more than 12,000 cfm, shall be demonstrated at each refueling outage prior to refueling.

2. After a secondary containment violation is determined, the standby gas treatment system will be operated immediately after the affected zones are isolated from the remainder of the secondary containment to confirm its ability to maintain the remainder of the secondary containment at 1/4-inch of water negative pressure under calm wind conditions.

LIMITING CONDITIONS FOR OPERATION

3.7.C. Secondary Containment

4. If refueling zone secondary containment cannot be maintained the following conditions shall be met:

   a. Handling of spent fuel and all operations over spent fuel pools and open reactor wells containing fuel shall be prohibited.

   b. The standby gas treatment system suction to the refueling zone will be blocked except for a controlled leakage area sized to assure the achieving of a vacuum of at least 1/4-inch of water and not over 3 inches of water in all three reactor zones. This is only applicable if reactor zone integrity is required.

D. Primary Containment Isolation Valves

1. When Primary Containment Integrity is required, all isolation valves listed in Table 3.7.A and all reactor coolant system instrument line flow check valves shall be OPERABLE except as specified in 3.7.D.2.

SURVEILLANCE REQUIREMENTS

D. Primary Containment Isolation Valves

1. The primary containment isolation valves surveillance shall be performed as follows:

   a. At least once per operating cycle, the OPERABLE isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation, and in accordance with Specification 1.0.MM, tested for closure times.

The primary containment leak rate test frequency is based on maintaining adequate assurance that the leak rate remains within the specification. The leak rate test frequency is based on the NRC guide for developing leak rate testing and surveillance of reactor containment vessels. Allowing the test intervals to be extended up to 10 months permits some flexibility needed to have the tests coincide with scheduled or unscheduled shutdown periods.

The penetration and air purge piping leakage test frequency, along with the containment leak rate tests, is adequate to allow detection of leakage trends. Whenever a bolted double-gasketed penetration is broken and remade, the space between the gaskets is pressurized to determine that the seals are performing properly. It is expected that the majority of the leakage from valves, penetrations and seals would be into the reactor building. However, it is possible that leakage into other parts of the facility could occur. Such leakage paths that may affect significantly the consequences of accidents are to be minimized.

The primary containment is normally slightly pressurized during period of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, determining the oxygen concentration twice a week serves as an added assurance that the oxygen concentration will not exceed 4 percent.

3.7.B/3.7.C Standby Gas Treatment System and Secondary Containment

The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The reactor building provides secondary containment during reactor operation, when the drywell is sealed and in service; the reactor building provides primary containment, if required, when the reactor is shutdown and the drywell is open. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required as well as during refueling.

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the stack during secondary containment isolation conditions. All three standby gas treatment system fans are designed to automatically start upon containment isolation and to maintain the reactor building pressure to the design negative pressure so that all leakage should be in-leakage.

High efficiency particulate air (HEPA) filters are installed before and after the charcoal absorbers to minimize potential release of particulates to the environment and to prevent clogging of the iodine absorbers. The charcoal absorbers 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 absorbers and a HEPA efficiency of at least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal absorbers are as specified, the resulting doses will be less than the 10 CFR 100 guidelines for the accidents analyzed. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal absorbers.

Only two of the three standby gas treatment systems are needed to clean up the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is no immediate threat to the containment system performance and reactor operation or refueling operation may continue while repairs are being made. If more than one train is inoperable all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel must be suspended and all reactors placed in a cold shutdown condition, because the remaining train would provide only 50 percent of the capacity required to filter and exhaust the reactor building atmosphere to the stack. Suspension of these activities shall not preclude movement of a component to a safe, conservative position. Operations that have the potential for draining the reactor vessel must be suspended as soon as practical to minimize the probability of a vessel draindown and subsequent potential for fission product release. Draindown of a reactor vessel containing no fuel does not present the possibility for fuel damage or significant fission product release and therefore is not a nuclear safety concern.

4.7.B/4.7.C Standby Gas Treatment System and Secondary Containment

Initiating reactor building isolation and operation of the standby gas treatment system to maintain at least a 1/4 inch of water vacuum within the secondary containment provides an adequate test of the operation of the reactor building isolation valves, leak tightness of the reactor building and performance of the standby gas treatment system. Functionally testing the initiating sensors and associated trip logic demonstrates the capability for automatic actuation. Performing these tests prior to refueling will demonstrate secondary containment capability prior to the time the primary containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after two years of operation in the rugged shipboard environment on the US Savannah (ORNL 3726). Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Heater capability, pressure drop and air distribution should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant shall be performed in accordance with USAEC Report DP-1082. Iodine removal efficiency tests shall follow ASTM D3803. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

1. Except as specified in Specification 3.7.B.3 below, all three trains of the standby gas treatment system shall be OPERABLE at all times when secondary containment integrity is required.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

1. At least once per year, the following conditions shall be demonstrated.

   a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at a flow of 9000 cfm (± 10%).

   b. The inlet heaters on each circuit are tested in accordance with ANSI N510-1975, and are capable of an output of at least 40 kW.

   c. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3. From and after the date that one train of the standby gas treatment system is made or found to be inoperable for any reason, REACTOR POWER OPERATION and fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE, provided that during such 7 days all active components of the other two standby gas treatment trains shall be OPERABLE.

4. If these conditions cannot be met:

   a. Suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.B.2 (Cont'd)

d. Each train shall be operated a total of at least 10 hours every month.

e. Test sealing of gaskets for housing doors shall be performed utilizing chemical smoke generators during each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3. a. Once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated from each unit's controls.

   b. At least once per year manual operability of the bypass valve for filter cooling shall be demonstrated.

   c. When one train of the standby gas treatment system becomes inoperable the other two trains shall be demonstrated to be operable within 2 hours and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3.7.B.4 (Cont'd)

b. Place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours.

3.7.C. Secondary Containment

1. Secondary containment integrity shall be maintained in the reactor zone at all times except as specified in 3.7.C.2.

2. If reactor zone secondary containment integrity cannot be maintained the following conditions shall be met:

   a. Suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

   b. Restore reactor zone secondary containment integrity within 4 hours, or place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours.

3. Secondary containment integrity shall be maintained in the refueling zone, except as specified in 3.7.C.4.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.C. Secondary Containment

1. Secondary containment surveillance shall be performed as indicated below:

   a. Secondary containment capability to maintain 1/4 inch of water vacuum under calm wind (< 5 mph) conditions with a system inleakage rate of not more than 12,000 cfm, shall be demonstrated at each refueling outage prior to refueling.

2. After a secondary containment violation is determined, the standby gas treatment system will be operated immediately after the affected zones are isolated from the remainder of the secondary containment to confirm its ability to maintain the remainder of the secondary containment at 1/4-inch of water negative pressure under calm wind conditions.

LIMITING CONDITIONS FOR OPERATION

3.7.C. Secondary Containment

4. If refueling zone secondary containment cannot be maintained the following conditions shall be met:

   a. Handling of spent fuel and all operations over spent fuel pools and open reactor wells containing fuel shall be prohibited.

   b. The standby gas treatment system suction to the refueling zone will be blocked except for a controlled leakage area sized to assure the achieving of a vacuum of at least 1/4-inch of water and not over 3 inches of water in all three reactor zones. This is only applicable if reactor zone integrity is required.

D. Primary Containment Isolation Valves

1. When Primary Containment Integrity is required, all isolation valves listed in Table 3.7.A and all reactor coolant system instrument line flow check valves shall be OPERABLE except as specified in 3.7.D.2.

SURVEILLANCE REQUIREMENTS

D. Primary Containment Isolation Valves

1. The primary containment isolation valves surveillance shall be performed as follows:

   a. At least once per operating cycle, the OPERABLE isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and in accordance with Specification 1.0.MM, tested for closure times.

The primary containment leak rate test frequency is based on maintaining adequate assurance that the leak rate remains within the specification. The leak rate test frequency is based on the NRC guide for developing leak rate testing and surveillance of reactor containment vessels. Allowing the test intervals to be extended up to 10 months permits some flexibility needed to have the tests coincide with scheduled or unscheduled shutdown periods.

The penetration and air purge piping leakage test frequency, along with the containment leak rate tests, is adequate to allow detection of leakage trends. Whenever a bolted double-gasketed penetration is broken and remade, the space between the gaskets is pressurized to determine that the seals are performing properly. It is expected that the majority of the leakage from valves, penetrations and seals would be into the reactor building. However, it is possible that leakage into other parts of the facility could occur. Such leakage paths that may affect significantly the consequences of accidents are to be minimized.

The primary containment is normally slightly pressurized during period of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, determining the oxygen concentration twice a week serves as an added assurance that the oxygen concentration will not exceed 4 percent.

3.7.B/3.7.C Standby Gas Treatment System and Secondary Containment

The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The reactor building provides secondary containment during reactor operation, when the drywell is sealed and in service; the reactor building provides primary containment, if required, when the reactor is shutdown and the drywell is open. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required as well as during refueling.

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the stack during secondary containment isolation conditions. All three standby gas treatment system fans are designed to automatically start upon containment isolation and to maintain the reactor building pressure to the design negative pressure so that all leakage should be in-leakage.

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 efficiency of at least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal adsorbers are as specified, the resulting doses will be less than the 10 CFR 100 guidelines for the accidents analyzed. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers.

Only two of the three standby gas treatment systems are needed to clean up the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is no immediate threat to the containment system performance and reactor operation or refueling operation may continue while repairs are being made. If more than one train is inoperable all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel must be suspended and all reactors placed in a cold shutdown condition, because the remaining train would provide only 50 percent of the capacity required to filter and exhaust the reactor building atmosphere to the stack. Suspension of these activities shall not preclude movement of a component to a safe, conservative position. Operations that have the potential for draining the reactor vessel must be suspended as soon as practical to minimize the probability of a vessel draindown and subsequent potential for fission product release. Draindown of a reactor vessel containing no fuel does not present the possibility for fuel damage or significant fission product release and therefore is not a nuclear safety concern.

4.7.B/4.7.C <u>Standby Gas Treatment System and Secondary Containment</u>

Initiating reactor building isolation and operation of the standby gas treatment system to maintain at least a 1/4 inch of water vacuum within the secondary containment provides an adequate test of the operation of the reactor building isolation valves, leak tightness of the reactor building and performance of the standby gas treatment system. Functionally testing the initiating sensors and associated trip logic demonstrates the capability for automatic actuation. Performing these tests prior to refueling will demonstrate secondary containment capability prior to the time the primary containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after two years of operation in <u>the rugged</u> shipboard environment on the US Savannah (ORNL 3726). Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Heater capability, pressure drop and air distribution should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant shall be performed in accordance with USAEC Report DP-1082. Iodine removal efficiency tests shall follow ASTM D3803. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples.

ENCLOSURE 2

DESCRIPTION AND JUSTIFICATION
BROWNS FERRY NUCLEAR PLANT (BFN)

REASON FOR CHANGE

BFN Units 1, 2, and 3 technical specifications (TSs), as described below, are being revised to clarify the Limiting Conditions for Operation (LCO) and associated bases pertaining to the interrelationships of primary containment, secondary containment, and the standby gas treatment systems (SGTS). This change will: (1) delete the remaining portion of temporary TS amendments 151, 147, and 122 for units 1, 2, and 3 respectively (SGTS); (2) clarify section 3.7.B.4 (SGTS) and its associated bases; (3) revise the requirements of section 3.7.C.2 (secondary containment); and (4) add a clarifying statement to section 3.7.C.4.b (SGTS and secondary containment).

DESCRIPTION AND JUSTIFICATION FOR THE PROPOSED CHANGE

(1) Deletion of the remaining portion of temporary TS amendments 151, 147, and 122 for units 1, 2, and 3 respectively.

These amendments were made to allow fuel movement for the purpose of fuel reconstitution for unit 2 with only two of the three SGTS trains operable and with the Control Room Emergency Ventilation System (CREVS) inoperable. This was justified based on the age of the fuel, i.e., minimal gaseous fission product activity. This change was a temporary change to be in effect until just prior to fuel load. The portion of these temporary amendments dealing with the CREVS were previously removed in amendments 156, 152, and 127 for units 1, 2, and 3 respectively. Fuel reconstitution has been completed and therefore the remainder of these amendments are being deleted. This is an administrative change to realign the BFN TS for plant operation.

(2) Clarify section 3.7.B.4 and its Associated Bases

Existing LCO 3.7.B.4 reads:

"If these conditions cannot be met, the reactor shall be placed in a condition for which the standby gas treatment system is not required."

Proposed change to LCO 3.7.B.4 would read:

"If these conditions cannot be met:

a. Suspend all fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

b. Place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours."

Justification for proposed change LCO 3.7.B.4

The SGTS provides a means for minimizing the release of radioactive material by filtering and exhausting the air from any or all zones of the unit 1, 2, and 3 reactor buildings. SGTS also maintains a negative pressure between the reactor buildings and the outside environment to preclude unfiltered leakage. Therefore, when the seven day LCO has been exceeded for one train of SGTS being inoperable or more than one train becomes inoperable, all operations which have a potential for initiating a radioactive release are suspended for all three units.

The proposed change is being made to clarify what specific actions are to be taken if the seven day LCO for one train of SGTS inoperable (LCO 3.7.B.3) cannot be met or if more than one train of the SGTS is inoperable. The current TS offers only general guidance if LCO 3.7.B.3 cannot be met and therefore creates the potential for varying interpretations by the operator as to what actions to take or what constitutes a condition where the SGTS is not required.

This change will provide specific actions required to be taken if the LCO cannot be met, thereby, minimizing the potential for misinterpretation. The actions required by this LCO will provide for the safe and timely cessation of activities which have a potential for an accidental release of radioactive material, and provide for an orderly shutdown of all reactors with minimum potential risk of fuel damage. This change is consistent with the General Electric (GE) Boiling Water Reactor (BWR) Standard TSs (NUREG 0123). The bases of TS 3.7.B are also being revised to reflect this change.

(3) Revise the Requirements of section 3.7.C.2

Existing LCO 3.7.C.2 reads:

"If reactor zone secondary containment integrity cannot be maintained the following conditions shall be met:

a. The reactor shall be made subcritical and Specification 3.3.A shall be met.
b. The reactor shall be cooled down below 212°F and the reactor coolant system vented.
c. Fuel movement shall not be permitted in the reactor zone.
d. Primary containment integrity maintained."

Proposed Change to LCO 3.7.C.2 would read:

"If reactor zone secondary containment integrity cannot be maintained the following conditions shall be met:

a. Suspend fuel handling operations, core alterations, and activities with the potential to drain any reactor vessel containing fuel.

b. Restore reactor zone secondary containment integrity within four hours, or place all reactors in at least a HOT SHUTDOWN CONDITION within the next 12 hours and in a COLD SHUTDOWN CONDITION within the following 24 hours."

Justification for proposed change to LCO 3.7.C.2

The secondary containment system is designed to minimize any ground level release of radioactive material which might result from a serious accident. The reactor building provides secondary containment during reactor operation, when the drywell is sealed and in service. The reactor building provides primary containment, if required, when the reactor is shutdown and the drywell is open. Because secondary containment is an integral part of the containment system, secondary containment is required any time primary containment is required as well as during refueling operations.

LCO 3.7.C.2.a is required for activities associated with the potential for immediate fuel damage or loss of reactor vessel water inventory. New or irradiated fuel handling operations and core alterations (i.e., movement of fuel, sources, incore instruments, or reactivity controls within the reactor pressure vessel with the head removed and fuel in the vessel) have the potential to cause a fuel handling accident. This LCO provides for an orderly suspension of these activities and for movement of a component to a safe conservative position.

LCO 3.7.C.2.b allows four hours to restore reactor building secondary containment operability before initiating shutdown of operating reactors. This allows a reasonable time to fix the problem before initiating shutdown. The allowed time to reach a HOT SHUTDOWN CONDITION (12 hours) and a COLD SHUTDOWN CONDITION (within the following 24 hours) is sufficient to allow an orderly shutdown and cooldown of the reactor. A controlled evolution minimizes the potential risk for fuel damage. This change and the specific allowable time frames are consistent with the GE BWR Standard TSs.

Since these requirements place the reactor in a safe condition and minimize the potential for occurrence of any design basis accident which could release radioactive material to the environment, the existing requirement 3.7.C.2.d (to maintain primary containment integrity), under these conditions, is unnecessary.

TS LCO 3.3.A defines the control rod shutdown margin and is applicable at all times during the fuel cycle. Uncoupling this from secondary containment does not change the TS requirement for control rod operability under TS 3.3.A.

A minor change to the bases is also being made to indicate that the reactor building provides primary containment, if required, when the reactor is shutdown and the drywell is open.

(4) Addition to section 3.7.C.4.b

Existing LCO 3.7.C.4.b reads:

> "The standby gas treatment system suction to the refueling zone will be blocked except for a controlled leakage area sized to assure the achieving of a vacuum of a least 1/4-inch of water and not over three inches of water in all three reactor zones."

Proposed change to LCO 3.7.C.4.b would add the following to the existing LCO:

> "This is only applicable if reactor zone integrity is required."

Justification for addition to section 3.7.C.4.b

This change eliminates the requirement to block the SGTS suction to the refueling zone if reactor zone secondary containment is not required. If reactor zone secondary containment was not required, the SGTS would not be required to be operable so the action of blocking its suction would be unneeded. This clarification precludes unnecessary interpretations of operability requirements when SGTS is not required to be operable.

(5) SUMMARY

Each of the proposed changes described above seeks to clarify the BFN TSs to minimize the need for interpretation and to bring them in line with GE BWR Standard TSs. Risk of design basis accidents without adequate containment or treatment are minimized by actions required to shutdown operating reactors in an orderly manner and to suspend fuel handling activities, core alterations, and activities with the potential to drain any reactor vessel.

ENCLOSURE 3

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

DESCRIPTION OF PROPOSED TS AMENDMENT

The proposed amendment would change the Browns Ferry Nuclear Plant (BFN) Technical Specifications (TS) for units 1, 2, 3 as follows: (1) delete the remaining portion of temporary TS amendments 151, 147, and 122 for units 1, 2, and 3 respectively; (2) clarify the actions to be taken in Limiting Conditions for Operations (LCOs) 3.7.B.4 and revise the bases accordingly; (3) revise the requirements of LCO 3.7.C.2; and (4) add a clarifying statement to LCO 3.7.C.4.b.

BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

NRC has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92(c). A proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from an accident previously evaluated, or (3) involve a significant reduction in a margin of safety.

1. The proposed amendment has no effect on the probability of any previously analyzed accident. Change (1) above deletes the remaining portion of temporary TS amendments which were done to allow fuel reconstitution on unit 2 with only two out of three SGTS trains operable. Unit 2 fuel reconstitution is complete. Change (2) above clarifies the actions to be taken if SGTS operability requirements cannot be met so that interpretations are not required. Change (3) above revises the actions to be taken if reactor zone secondary containment is not operable to be consistent with GE BWR Standard TSs and eliminates the unnecessary requirement that primary containment be operable. Because of the plant design, primary containment cannot be maintained during refueling outages. Change (4) above adds a clarifying statement that the SGTS suction to the refueling zone does not have to be blocked if reactor zone secondary containment is not required.

   The risks of fuel handling and reactivity insertion accidents are minimized since fuel movement and core alterations are excluded when secondary containment is not operable or insufficient SGTS capacity is available. Collectively, these changes provide specific actions to be taken if the conditions of LCOs cannot be met for the SGTS or secondary containment system. These systems serve to contain and filter the radioactive material released in an accident. These TS changes provided for an orderly and controlled suspension of activities with the potential to lead to an accident if an LCO cannot be met. These changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated. The changes clarify what to do when either the SGTS or secondary containment LCOs cannot be met. The resulting actions to mitigate radioactive material release are consistent with current plant practice and the GE BWR Standard TS requirements. No new modes of plant operation are introduced which could contribute to the possibility of a new or different kind of accident.

3. The proposed amendments do not involve a significant reduction in a margin of safety. The change is consistent with the existing BFN Safety Analysis. No adverse safety impact or reduction in safety margins occurs due to the proposed changes. They minimize operator interpretation and provide for an orderly shutdown of operating reactors and cessation of activities with the potential to release radioactive material if system LCOs cannot be met.

DETERMINATION OF BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS

Because the application for amendment involves a proposed change that is encompassed by the criteria for which no significant hazards consideration exists, TVA has made a proposed determination that the application involves no significant hazards consideration.