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May 8, 2000

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: River Bend Station - Unit 1
Docket No. 50-458
License No. NPF-47
License Amendment Request (LAR) 2000-02, "Changes to Fuel Building and Fuel Building Ventilation System Requirements ".

File Nos.: G9.5, G9.42

RBEXEC-00-018
RBF1-00-0069
RBG-45340

Gentlemen:

In accordance with 10 CFR 50.59(c) and 10CFR50.90, Entergy Operations, Inc. (EOI) hereby applies for amendment of Facility Operating License No. NPF-47, for the River Bend Station (RBS). The proposed amendment involves a change to the Technical Specifications regarding the fuel building and fuel building ventilation system requirements.

The proposed change was reviewed against the criteria of 10 CFR 50.92, and was determined to not involve a significant hazards consideration. Enclosure 1 is an affidavit supporting the facts set forth in this letter and the attachments. This request has been reviewed and approved by the RBS Facility Review Committee and the Safety Review Committee. Enclosure 2 provides a description of the proposed changes and the associated justification (including the determination of no significant hazards consideration). There are no commitments contained in this submittal as indicated on the Commitments Identification Form in Attachment 1. Attachment 2 contains marked-up pages reflecting the amendment being requested. The associated marked-up Technical Specification Bases pages are also included as Attachment 3 and will be revised in accordance with the Technical Specification Bases Control Program required by Technical Specification 5.5.11. Attachments 4 and 5 provide additional details regarding dose calculations supporting this amendment request.

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The proposed changes to the fuel building and fuel building ventilation system requirements are based on precedent licensing actions. The proposed treatment of the fuel building and fuel building ventilation system separately from secondary containment requirements is consistent with the Technical Specifications for the Perry Nuclear Power Plant. The relaxation of related requirements except when moving recently irradiated fuel is similar to changes to the Grand Gulf Nuclear Station (GGNS) Technical Specifications, which were approved by Amendment 139.

EOI has reviewed this request against the criteria of 10 CFR 51.22 for environmental considerations. The proposed change does not involve a significant hazards consideration. Also, the type and amount of effluent released from RBS is not changed. Further, the amount of individual or cumulative occupational dose does not increase as a result of this change. Therefore, based on the foregoing, EOI concludes that the proposed change meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

The NRC approval is requested by July 30, 2000, to support activities that are scheduled to begin in August that require opening the fuel building doors during power operation. If you have any questions regarding this request or require additional information, please contact Mr. Joseph W. Leavines at (225) 381-4642.

Sincerely,

Randall K. Edington

RKE/RJK/JWL

Enclosures (2)
Attachments (5)

cc: (w/encl. and att.)

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ENCLOSURE 1

BEFORE THE UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-47

DOCKET NO. 50-458

IN THE MATTER OF ENTERGY GULF STATES, INC. AND ENTERGY OPERATIONS, INC.

AFFIRMATION

I, Randall K. Edington, state that I am Vice President - Operations of Entergy Operations, Inc. at River Bend Station; that on behalf of Entergy Operations, Inc., I am authorized by Entergy Operations, Inc., to sign and file with the Nuclear Regulatory Commission, this River Bend Station License Amendment Request (LAR) 2000-02 "Changes to Fuel Building and Fuel Building Ventilation System Requirements," that I signed this letter as Vice President - Operations at River Bend Station of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information, and belief.

Randall K. Edington
Randall K. Edington
STATE OF LOUISIANA
PARISH OF WEST FELICIANA

SUBSCRIBED AND SWORN TO before me, a Notary Public, commissioned in the Parish above named, this 8th day of May, 2000.

(SEAL)

Claudia F. Hurst
Claudia F. Hurst
Notary Public

ENCLOSURE 2

Entergy Operations Incorporated
RIVER BEND STATION
DOCKET 50-458/LICENSE NO. NPF-47

Change to Fuel Building and Fuel Building Ventilation System Requirements.

(LAR 2000-02)

DOCUMENTS INVOLVED

River Bend Station Technical Specifications:

- 3.3.6.2, "Secondary Containment Isolation Instrumentation"
- 3.6.4.1, "Secondary Containment Operating"
- 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs)"
- 3.6.4.5, "Fuel Building"
- 3.6.4.6, "Fuel Building Ventilation System – Operating"
- 3.6.4.7, "Fuel Building Ventilation System – Fuel Handling"
- 3.10.1, "Inservice Leak and Hydrostatic Testing Operation"

REASON FOR REQUEST

River Bend is preparing to expand onsite spent fuel storage capability by implementing a dual-purpose dry fuel storage system. Because the Fuel Building at River Bend Station has very little staging room, a single fuel canister or cask will have to be brought into the building, loaded, then removed from the building as soon as it is sealed. The actual transfer of fuel from the spent fuel pool is not scheduled to begin until 2002. However, EOI's current concern is that used control rod blades that are currently stored in the fuel building pools must be removed to accommodate staging areas for fuel cask loading. This activity is scheduled to begin in September, 2000. Approval of these proposed changes are requested by July 30, 2000 to allow for fuel building preparations, including inspection and maintenance of the access doors to support removal and shipment of the used control rod blades.

The Fuel Building is currently part of Secondary Containment which is required to be OPERABLE in accordance with Technical Specification 3.6.4.1 during Modes 1, 2, and 3. The Fuel Building is also required to be OPERABLE in accordance with Technical Specification 3.6.4.5 when moving irradiated fuel assemblies in the fuel building (including Modes 4 and 5). This means that the only time casks can currently be moved into or out of the building is during refueling outages after fuel movement has been completed. Experience at Arkansas Nuclear One and several other plants has shown that loading and sealing a canister can take one to two weeks and potentially longer. Maintaining the Fuel Building OPERABLE, as part of the secondary containment would significantly increase refueling outage duration.

The proposed amendment will remove the Fuel Building from the Secondary Containment boundary during Modes 1, 2, and 3. The proposed treatment of the fuel building and fuel building ventilation system separately from secondary containment requirements are consistent with the Technical Specifications (TS) for the Perry Nuclear Power Plant (PNPP). There are a few differences in the RBS proposed changes due to plant specific design differences in the fuel building ventilation system. In addition, the auxiliary building will continue to be considered a part of secondary containment at RBS. Also, EOI prefers that the fuel building and fuel building ventilation requirements remain in TS section 3.6, "Containment Systems" for RBS, whereas the PNPP requirements are located in TS section 3.7, "Plant Systems".

The proposed amendment will also relax Fuel Building and Fuel Building Ventilation requirements except when handling "recently irradiated fuel." Note that Amendment 85, which was approved by the NRC, defined "recently irradiated fuel" as "fuel that has occupied part of a critical reactor core within the previous 11 days." The relaxation of these requirements except when moving recently irradiated fuel is similar to previously approved changes to the Grand Gulf Nuclear Station (GGNS) Technical Specifications. These changes were approved in Amendment 139 by letter from S. Patrick Sekerak to William A. Eaton, dated October 20, 1999. These proposed RBS TS changes are more limited in scope than the GGNS TS amendment in that the RBS proposed changes only affect the requirements associated with the fuel building and fuel building ventilation system.

Technical Specification (TS) 3.6.4.1, "Secondary Containment Operating", requires that the shield building, auxiliary building, and fuel building be OPERABLE during MODES 1, 2, and 3. This requirement was implemented to ensure that, in the event of a postulated design basis accident (LOCA), contaminated containment leakage that could potentially bypass the containment annulus would be treated and filtered by the secondary containment filters prior to release to the environment.

TS 3.6.4.5, "Fuel Building" requires the fuel building to be OPERABLE during movement of irradiated fuel in the fuel building. TS 3.6.4.7, "Fuel Building Ventilation System – Fuel Handling," requires that "Two fuel building ventilation charcoal filtration subsystems shall be OPERABLE and one shall be operating in emergency mode" during movement of irradiated fuel in the fuel building. These requirements were implemented to ensure that, in the event of a postulated Fuel Handling Accident (FHA), fuel building air contaminated with fission products released from the damaged fuel would be treated and filtered by the Fuel Building Ventilation System's filters prior to release to the environment.

DESCRIPTION OF PROPOSED CHANGE

The proposed changes involve a change to the Technical Specifications (TS) and a corresponding revision to the Updated Safety Analysis Report (USAR) DBA-LOCA dose analysis to reflect approval of the TS changes. There are two basic Technical Specification changes being proposed:

1) exclusion of the fuel building and the fuel building ventilation system from the requirements associated with secondary containment during power operation and

2) relaxation of the fuel building and fuel building ventilation OPERABILITY requirements such that OPERABILITY is only required when moving "recently irradiated fuel."

Primarily, the proposed changes would remove the Fuel Building from the secondary containment boundary requirements of Technical Specification 3.6.4.1, "Secondary Containment Operating", during OPERATIONAL Modes 1, 2, and 3 and delete Technical Specification 3.6.4.6, "Fuel Building Ventilation System – Operating". Associated changes are also proposed to 3.3.6.2, "Secondary Containment Isolation Instrumentation; 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs)"; and to 3.10.1, "Inservice Leak and Hydrostatic Testing Operation" to reflect the treatment of the fuel building as separate from the secondary containment requirements. Corresponding sections of the RBS USAR would be revised to be consistent with the change in secondary containment requirements.

The proposed change would also relax the Fuel Building and Fuel Building Ventilation requirements during fuel handling found in Technical Specification 3.6.4.5, "Fuel Building" and 3.6.4.7, "Fuel Building Ventilation System – Fuel Handling." Specifically, it is proposed that Technical Specification LCOs 3.6.4.5 and 3.6.4.7 only apply to the movement of "recently irradiated fuel," similar to Amendment 85 which was approved for the containment personnel air-locks (TS LCO 3.6.1.2). The Amendment 85 Fuel Handling Accident analysis, including the revision that was recently reviewed by the NRC, bounds this change in its entirety and no new analysis is required.

RBS CURRENT LICENSING BASIS

The function of the secondary containment is to contain, dilute, and hold up fission products that may leak from primary containment following a Design Basis Accident (DBA) or that may be released during certain operations that take place inside primary containment, when primary containment is not required to be OPERABLE, or that take place outside primary containment. The secondary containment is designed to function in conjuction with the operation of the Standby Gas Treatment (SGT) system, Fuel Building Ventilation system and the closure of certain valves whose lines penetrate the secondary containment to reduce the activity level of the fission products prior to release to the environment.

The secondary containment currently consists of the shield building, auxiliary building, and fuel building, and completely encloses the primary containment and those components that may be postulated to contain primary system fluid. This structure forms a control volume that serves to hold up and dilute the fission products. It is possible for the pressure in the control volume to rise relative to the environmental pressure (*e.g.*, due to pump/motor heat load additions). To prevent ground level exfiltration while allowing the secondary containment to be designed as a conventional structure, the secondary containment requires support systems to maintain the control volume pressure at less than the external pressure. Requirements for these systems are specified separately in LCO 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs)," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.6.4.4, "Shield Building Annulus Mixing System," and LCO 3.6.4.5, "Fuel Building."

The isolation devices for the penetrations in the secondary containment boundary are a part of the secondary containment barrier. To maintain this barrier:

a. All Auxiliary Building penetrations, Fuel Building penetrations and Shield Building annulus penetrations required to be closed during accident conditions are either:

   1. Capable of being closed by an OPERABLE secondary containment automatic isolation signal, or
   2. Closed by at least one manual valve, blind flange, or de-activated automatic valve or damper, as applicable, secured in its closed position, except as provided in LCO 3.6.4.2;

b. All Auxiliary Building, Fuel Building and Shield Building Annulus equipment hatches are closed and sealed;

c. The Standby Gas Treatment System is OPERABLE, except as provided in LCO 3.6.4.3;

d. The Fuel Building Charcoal Filtration System is OPERABLE, except as provided in LCO 3.6.4.6; and

e. At least one door in each access to the Auxiliary Building, Fuel Building and Shield Building Annulus is closed, except for routine entry and exit of personnel and equipment.

There are two principal accidents for which credit is currently taken for secondary containment OPERABILITY. These are a Loss of Coolant Accident (LOCA) and a Fuel Handling Accident (FHA) in the fuel building. The secondary containment performs no active function in response to each of these limiting events; however, its leak tightness is required to ensure that the release of radioactive materials from the primary containment is restricted to those leakage paths and associated leakage rates assumed in the accident analysis, and that fission products entrapped within the secondary containment structures will be treated by the SGT System or Fuel Building Ventilation System prior to discharge to the environment. Operability of the secondary containment satisfies Criterion 3 of the NRC Policy Statement.

An OPERABLE secondary containment provides a control volume into which fission products that bypass or leak from primary containment, or are released from the reactor coolant pressure boundary components located in the shield building, auxiliary building, or fuel building, can be diluted and processed prior to release to the environment. For the secondary containment to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained.

In MODES 1, 2, and 3, a LOCA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, secondary containment OPERABILITY is required during the same operating conditions that require primary containment OPERABILITY.

In MODES 4 and 5, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5 to ensure a control volume, except for other situations for which significant releases of radioactive material can be postulated, such as during movement of irradiated fuel assemblies in the fuel building. The fuel building OPERABILITY during irradiated fuel handling is addressed in LCO 3.6.4.5, "Fuel Building" and LCO 3.6.4.7, "Fuel Building Ventilation Systems - Fuel Handling."

The radiological consequences of the design basis LOCA are discussed in USAR Section 15.6.5. The analysis assumes that the annulus bypass leakage is into either the Auxiliary Building, where the leakage would be treated by the SGTS, or into the Fuel Building, where the bypass leakage would be treated by the Fuel Building Ventilation System prior to release to the environment.

River Bend currently evaluates the radiological consequences of three separate design basis FHA scenarios. These analyses are documented in USAR Section 15.7.4. The first analysis assumed a FHA occurs in the Fuel Building 24 hours after shutdown. This constituted the original "design basis" scenario. A second evaluation was prepared in support of Amendment 35 which allowed a maximum of 12 vent and drain lines to be opened during fuel movement to support local leakage rate testing. The third evaluation was prepared to support Amendment 85, which allowed opening of the containment personnel airlock lock (PAL) doors 11 days post-shutdown. In this analysis no credit was taken for containment integrity after the 11 day source term decay period. All three analyses were recently submitted to the NRC due to changes in methodologies and assumptions. The NRC approved the changes to the River Bend USAR via Amendment 110 (letter from Robert J. Fretz of the USNRC to Randall K. Edington of EOI dated March 2, 2000).

DETAILS OF PROPOSED CHANGES TO RBS CURRENT LICENSING BASIS

The proposed TS changes also involve a change to the current DBA LOCA dose analysis. The revised analysis supports exclusion of the fuel building and the fuel building ventilation charcoal filtration system from the requirements associated with secondary containment during MODES 1, 2, and 3. The current fuel handling accident (FHA) analysis performed for Amendment 85, as revised for Amendment 110, is unchanged but used to justify relaxations to the requirements of the fuel building, the fuel building ventilation system, the fuel building isolation dampers, and the fuel building isolation instrumentation based on irradiated fuel source term decay time. The details of the proposed TS changes are described below.

3.3.6.2, "Secondary Containment Isolation Instrumentation"

The TS is being amended to reflect exclusion of the fuel building from the requirements associated with the secondary containment boundary. The headings, LCO, CONDITIONS, REQUIRED ACTIONS, and NOTES are revised to maintain applicable requirements for fuel building isolation instrumentation while distinguishing this isolation function from the secondary containment function. In addition, the APPLICABILITY for the fuel building isolation functions are revised to only require OPERABILITY during movement of "recently irradiated" fuel assemblies in the fuel building. The TS Bases will define the term "recently irradiated" as "fuel that has occupied part of a critical reactor core within the previous 11 days".

3.6.4.1, "Secondary Containment Operating"

The TS is being amended to exclude the fuel building from the requirements of secondary containment during MODES 1, 2, and 3. Associated surveillance requirements are also modified or deleted to reflect the change.

3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs)"

The TS is being amended to reflect exclusion of the fuel building from requirements associated with the secondary containment boundary. The headings, LCO, CONDITIONS, REQUIRED ACTIONS, and NOTES are revised to maintain the applicable requirements for fuel building isolation dampers while distinguishing this isolation function from the secondary containment function. In addition, the APPLICABILITY for the fuel building isolation dampers are revised to only require OPERABILITY during movement of "recently" irradiated fuel assemblies in the fuel building.

3.6.4.5, "Fuel Building"

The TS is being amended so that it is only applicable during movement of "recently" irradiated fuel assemblies in the fuel building. The associated REQUIRED ACTION is also changed to be consistent with the APPLICABILITY.

3.6.4.6, "Fuel Building Ventilation System – Operating"

The TS is being deleted. The fuel building ventilation charcoal filtration subsystems are not credited in the revised DBA LOCA analysis. The fuel building charcoal filtration subsystems are only required to support the Fuel Handling Accident, which is addressed by TS 3.6.4.7. Therefore, deletion of this TS is acceptable because the charcoal filtration subsystems are not credited as an accident mitigating function during MODES 1, 2, or 3 and do not satisfy any of the criteria of 10 CFR 50.36 (c)(2)(ii) for Technical Specification limiting conditions for operations.

3.6.4.7, "Fuel Building Ventilation System – Fuel Handling"

The TS is being amended so that it is only applicable during movement of "recently" irradiated fuel assemblies in the fuel building. The associated REQUIRED ACTION is also changed to be consistent with the APPLICABILITY.

3.10.1, "Inservice Leak and Hydrostatic Testing Operation"

The TS is being amended to delete the reference to LCO 3.6.4.6, "Fuel Building Ventilation System – Operating" since that LCO is no longer required during MODE 3. In addition, an editorial change is proposed to correct an error that was introduced during the conversion to Improved Technical Specifications (Amendment 81). LCO 3.10.1.a. lists Functions 1, 2, 3, 4, 5, and 6 of Table 3.3.6.2-1 as MODE 3 requirements. However, Table 3.3.6.2-1 correctly lists only five functions and only functions 1, 2, and 5 are MODE 3 requirements. Therefore, the references to Functions 3, 4, and 6 are deleted.

The proposed change to the current design basis LOCA dose analysis concerns the treatment of annulus bypass leakage by the Fuel Building Ventilation System. By removing the Fuel Building from the secondary containment boundary during normal operation, all annulus bypass leakage is conservatively assumed to be directly to the environment without treatment or filtration. The proposed changes concerning fuel building integrity during fuel handling would affect the current design basis Fuel Handling Accident (FHA) analysis for the fuel building. However, the Amendment 85 analysis, which was recently reviewed by the NRC, bounds the proposed changes to Technical Specifications 3.6.4.5, "Fuel Building" and 3.6.4.7 "Fuel Building Ventilation System - Fuel Handling".

Without credit for treatment and filtration by the Fuel Building Ventilation System the design basis maximum hypothetical accident (MHA) dose analysis will require revision. The current design bases as described above applies to conditions or Operational MODES when the Fuel Building integrity is maintained. The current design basis MHA dose analysis assumes that the annulus bypass leakage following a LOCA is into either the Auxiliary Building, where the leakage would be treated by the SGTS, or into the Fuel Building, where the bypass leakage would be treated by the Fuel Building Ventilation System prior to release to the environment. If the Fuel Building integrity is not maintained, such as when the fuel building doors are temporarily opened to move materials into or out of the Fuel Building, any releases from the annulus bypass are assumed to be directly to the environment. Details of the changes to the current design basis LOCA dose analysis are given in Attachment 4.

Credit is currently taken for treatment and filtration by the Fuel Building Ventilation System in the Fuel Handling Accident - Fuel Building (FHA-FB) dose analysis. Therefore, the FHA-FB scenario would need to be evaluated without any credit for filtration prior to the release of radioactivity to the environment. As stated earlier, the evaluation performed for the Amendment 85 submittal, as revised to support Amendment 110, bounds such a scenario. Justification for this conclusion is contained in Attachment 5.

JUSTIFICATION FOR PROPOSED CHANGES

The justification for the proposed changes is based on conservative dose calculations which demonstrate that the potential dose consequences remain within regulatory requirements. Requirements for radioactive effluent release monitoring are established by Technical Specification 5.5.4, Radioactive Effluent Controls Program. The requirements for fuel building effluent release monitoring under this program are unaffected by this proposed amendment.

Dose Calculations

The proposed change in the current design basis LOCA dose analysis concerns the treatment of annulus bypass leakage by the Fuel Building Ventilation System. By removing the Fuel Building from the secondary containment boundary, all annulus bypass leakage is assumed to be released directly to the environment without treatment or filtration. This is a conservative assumption since some annulus bypass leakage would be to the Auxiliary Building where it would be filtered before release.

The calculated doses for all offsite and onsite evaluation points are within the 10 CFR Part 100 criteria for offsite doses and within the General Design Criterion 19 of 10 CFR Part 50 for the Control Room. The offsite thyroid doses for the Exclusion Area Boundary (EAB) and the Low Population Zone (LPZ) are 83 Rem and 125 Rem respectively. These doses are well within the 300 Rem criteria of 10 CFR Part 100. The offsite whole body doses at the EAB and LPZ are 6 Rem and 3 Rem respectively which are well within the 25 Rem criteria of 10 CFR Part 100. The Control Room thyroid dose is 9 Rem and the skin dose is 10 Rem which are within the 30 Rem limit provided in General Design Criterion 19 of 10 CFR Part 50. The Control Room whole body dose is less than 1 Rem which is within the 5 Rem limit given in General Design Criterion 19 of 10 CFR Part 50.

The LOCA offsite doses increase by less than 3% due to releasing all annulus bypass leakage directly to the environment. The largest increase is to the LPZ doses since these are 30-day cumulative doses. For the LPZ dose, the largest increase is in the thyroid dose since the increase in untreated and unfiltered release has a more significant impact on the thyroid doses. The control room doses exhibit the largest percentage increase in the thyroid dose due to the increase in unfiltered and untreated iodine released to the environment, the release rate to the environment, and the changes in the control room atmospheric diffusion coefficient due to dual air intakes. However, the change in control room thyroid dose reduces the margin to the regulatory limit by only 4%. The calculated doses for all offsite and onsite evaluation points remain well below the applicable regulatory limits.

The proposed changes to Fuel Building Ventilation System requirements would impact the FHA-FB dose analysis. The current Fuel Building analysis remains valid for movement of "recently irradiated fuel" in the fuel building. For fuel which has decayed for at least 11 days, the FHA evaluation prepared for Amendment 85, as revised to support Amendment 110, bounds the proposed changes, and would bound movement of irradiated fuel in the fuel building after 11 days with no filtration. The Amendment 85 analysis assumed a building release rate of 6000 volume % per day, which meets Regulatory Guide 1.25. River Bend's Updated Safety Analysis Report (USAR), Section 9.4.2, describes the Fuel Building Ventilation System. The nominal flow rate for the system is 10,000 cfm which equates to roughly 2000 volume % per day. Thus, the release rate assumed in the revised Amendment 85 analysis conservatively bounds the expected actual release rate. Finally, both scenarios assume that 150 fuel rods would be damaged as a result of the dropped fuel. This conservatively bounds the GESTAR II methodology previously used to ensure that future fuel designs will be bounded. If GESTAR II methodology is used, then the drop of a fuel assembly (along with the grapple and hoist) would results in 122 rods being damaged in the containment building. However, due to the smaller drop height, only a maximum of 103 rods would be damaged by a drop in the fuel building.

RELATIONSHIP TO OTHER LICENSEE AMENDMENT REQUESTS

River Bend Station currently has several pending or approved Licensee Amendment Requests (LAR) which are either directly or indirectly related to the changes requested here. The potential impact to those submittals is discussed below.

- **LAR 99-15, "Changes to Technical Specifications for Power Uprate of River Bend Station":** LAR 99-15 was submitted to the NRC by letter RBG-45077, from Randall K. Edington of EOI to the U.S. Nuclear Regulatory Commission, dated July 30, 1999. This LAR requested an increase in core thermal power and reactor pressure. These requested changes had an impact on the off-site LOCA and FHA dose evaluations. The FHA changes were included in LAR 99-29, which is discussed below. The LOCA analysis had two major impacts due to Power Uprate. The first was core thermal power. Specifically, the source term assumed is directly proportional to core thermal power and, therefore, the increase in core thermal power results in an increase in source term available for release. The second impact is an increase in the positive pressure period (PPP) assumed. The PPP is the time period which secondary containment exceeds -0.25" w.g. with respect to the atmosphere. The PPP assumed for the Power Uprate LOCA dose analysis was 700 seconds. The LOCA dose analysis discussed in Attachment 4 conservatively includes both of these impacts. These assumptions conservatively bound current plant operations.

- **LAR 99-24, "Revision to Post-Loss of Coolant Accident Dose Calculation":** LAR 99-24 was submitted to the NRC via EOI letter RBG-45154, from Randall K. Edington of EOI to the U.S. Nuclear Regulatory Commission, dated October 29, 1999. This LAR requested NRC approval of a revised LOCA dose calculation. The LOCA dose analysis was revised for several reasons. First, the suppression pool volume was adjusted to account for the presence of submerged objects in the suppression pool; thus, the volume was conservatively lowered. Another change was the addition of an arbitrary liquid leakage term. This was added to account for the potential affects of liquid leakage bypassing secondary containment similar to the concerns documented in NRC Information Notice (IN) 91-56. The revised LOCA analysis also conservatively revised the model for Engineered Safety Features (ESF) liquid leakage. Specifically, the leakage was assumed to be released directly to the environment during the PPP (consistent with containment leakage) rather than being held in the auxiliary building. Finally, the revised analysis assumed an increase in the PPP to account for potential differential-temperature induced effects on the secondary containment vacuum as documented in NRC IN 88-76. The revised LOCA analysis was approved by the NRC, via Amendment 111, as documented in a letter from Robert J. Fretz of the NRC to Randall K. Edington of EOI, dated March 17, 2000. The analysis prepared in support of this LAR accounts for all of these changes. Specifically, the revised ESF liquid leakage model is used, the lower suppression pool volume is assumed, and the IN 91-56 liquid leakage term is included. Also, the analysis assumed a PPP of 700 seconds. EOI calculated a PPP less than 450 seconds, which accounted for IN 88-76 concerns, therefore, any potential temperature induced differential-pressure concerns are clearly bounded.

- **LAR 99-29, "Revision to the Fuel Handling Accident Dose Calculation":** LAR 99-29 was submitted to the NRC via EOI letter RBG-45185, from Randall K. Edington of EOI to the U.S. Nuclear Regulatory Commission, dated December 16, 1999. This LAR requested a change to the Fuel Handling Accident (FHA) calculations documented in the Updated Safety Analysis Report (USAR). Revision to the analysis resulted in an increase in calculated doses which constituted an Unreviewed Safety Question. Rather than perform an independent analysis for the upcoming refueling outage, the analyses prepared to support Power Uprate were submitted since they clearly bound current plant design and operation. The NRC issued Amendment 110 to Operating License NPF-47 via a letter from Robert J. Fretz of the NRC to Randall K. Edington of EOI, dated March 2, 2000 authorizing the revision to the analyses. Case III of that submittal encompasses the change requested by this application (LAR 2000-02) as discussed in Attachment 5 to this submittal.

- **LAR 99-30, "IFTS Blind Flange":** LAR 99-30 was submitted to the NRC via EOI letter RBG-45202, from Randall K. Edington of EOI to the U.S. Nuclear Regulatory Commission, dated December 20, 1999. That submittal requested removal of the Inclined Fuel Transfer System (IFTS) blind flange during plant operating Modes 1, 2, and 3 to support preparation and testing of IFTS for refueling outages. The impact to the off-site LOCA dose calculation due to that submittal was an increase in the PPP for the Fuel Building. The analysis prepared in support of this submittal effectively assumes an infinite PPP since no credit is taken for the Fuel Building.

In summary, the LOCA dose analysis prepared in support of this LAR bounds the requested changes of LAR 99-15, LAR 99-24, and LAR 99-30. Case III of LAR 99-29 bounds the impacts to the FHA dose analysis as a result of the changes requested here (See Attachment 3 for details).

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Entergy Operations, Inc. (EOI) proposes to change the River Bend Station (RBS) Technical Specifications and the Updated Safety Analysis Report (USAR) LOCA dose analyses. The changes involve removal of the Fuel Building from the secondary containment boundary requirements of Technical Specification 3.6.4.1, "Secondary Containment Operating", during OPERATIONAL Modes 1, 2, and 3. Related changes are also proposed to TS 3.3.6.2, "Secondary Containment Isolation Instrumentation" and TS 3.6.4.2, "Secondary Containment Isolation Dampers". The proposal would also eliminate TS 3.6.4.6, "Fuel Building Ventilation System – Operating" and reflect the elimination in TS 3.10.1, "Inservice Leak and Hydrostatic Testing Operation". The proposed changes also include relaxation of TS 3.6.4.5, "Fuel Building" and TS 3.6.4.7 "Fuel Building Ventilation System - Fuel Handling," except during the movement of "recently" irradiated fuel.

In accordance with 10 CFR 50.59(c), EOI is submitting an application for amendment of the license, pursuant to 10 CFR 50.90, to request NRC review and approval of the proposed change.

The Commission has provided standards for determining whether an amendment involves no significant hazards consideration, which are stated in 10 CFR 50.92(c). A proposed amendment to an operating license involves no significant hazards consideration 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 any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. EOI has evaluated the proposed license amendment in accordance with 10 CFR 50.91(a), and is providing its analysis of the issue of no significant hazards consideration using the three standards in 10 CFR 50.92(c).

(1) The proposed changes, do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes to the Technical Specifications involve removing the Fuel Building and the fuel building ventilation system from the requirements associated with the Secondary Containment boundary. The changes result in conservatively assuming that all annulus bypass leakage following a DBA LOCA are directed to the environment for the duration of the accident. Since the proposed changes only affect functions that are required subsequent to a LOCA or fuel handling accident (FHA), the proposed changes have no effect on the probability of an accident. The Fuel Building portion of the Secondary Containment boundary is not an active component that could affect the proper operation of any other essential safety feature or component. Removal of the Fuel Building from the Secondary Containment boundary does not affect any other safety-related system, component, or structure that would increase the probability of an accident previously evaluated. The proposed change only has an impact on the dose consequences of the design basis accident and does not have any affect on the accident precursors or other accident mitigating features.

A plant-specific radiological analysis has been performed to assess the affects of the proposed change in the annulus bypass leakage release pathway in terms of Control Room and off-site doses following a postulated design basis LOCA. The calculated doses for all offsite and onsite evaluation points are within the 10 CFR Part 100 criteria for offsite doses and within the General Design Criterion 19 of 10 CFR Part 50 for the Control Room.

The calculated offsite DBA LOCA doses due to the proposed changes result in an increase of less than 3% due to releasing all annulus bypass leakage directly to the environment. The control room doses exhibit the largest percentage increase in the thyroid dose due to the increase in unfiltered and untreated iodine released to the environment, the release rate to the environment, and the changes in the control room atmospheric diffusion coefficient due to dual air intakes. However, the change in control room thyroid dose reduces the margin to the regulatory limit by only 4%. The calculated doses for all offsite and onsite evaluation points are not significantly increased and remain within the 10 CFR Part 100 criteria for offsite doses and within the General Design Criterion 19 of 10 CFR Part 50 for control room.

The proposed changes also include relaxation of requirements for the fuel building and fuel building ventilation system except during the movement of "recently" irradiated fuel. The term "recently irradiated" is defined as "fuel that has occupied part of a critical reactor core within the previous 11 days". This change is justified based on the irradiated fuel source term decay period. River Bend currently evaluates three FHA scenarios, one for the fuel building and two for containment. The FHA-FB scenario would be impacted by the proposed changes since the scenario assumed filtration for the duration of the release. However, the proposed changes are bounding in their entirety by the FHA dose evaluation prepared in support of Amendment 85, as revised to support Amendment 110. The current analysis assumes that a FHA occurs with the containment personnel air locks (PAL) open, thus, no credit is taken for primary containment after an 11 day source term decay period. The release rate assumed in that analysis bounds the Fuel Building's normal ventilation rate by a factor of approximately 3 and easily meets Regulatory Guide 1.25 assumptions. All other data and assumptions (other than decay time of course) are identical for the two analyses and thus, the Amendment 85 analysis is valid for the Fuel Building.

It is therefore concluded that the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

(2) The operation of River Bend Station, in accordance with the proposed amendment, does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes affect the TS requirements for the fuel building and fuel building ventilation system. These changes have no impact on any other safety-related system, component, or structure. The type of accident and the accident precursors are not affected by changing the annulus bypass release path. The Fuel Building portion of the Secondary Containment boundary is not an active component that could affect the proper operation of any other essential safety feature or component. Also, the accident mitigating features that are currently credited in the response to the design basis accident are unchanged by the proposed change. Changing the release path for the annulus bypass leakage does not create a new or different kind of accident from the accidents previously evaluated.

It is therefore concluded that the proposed change does not create the possibility of a new or different kind of accident from any previously analyzed.

(3) The operation of River Bend Station, in accordance with the proposed amendment, does not involve a significant reduction in a margin of safety.

The fuel building and the associated fuel building ventilation filtration system are currently credited as part of the secondary containment function. The modified secondary containment boundary (excluding the fuel building) will still be capable of performing its design function of limiting offsite and control room dose to within regulatory limits. The only accident consequences that are impacted by the proposed change in the secondary containment (annulus) bypass leakage path are the dose consequences of the design basis LOCA. The previous dose analysis is changed by assuming that all annulus bypass leakage is directly to the environment instead of being released into the Fuel Building where the release would be treated by the Fuel Building Ventilation System before release. A plant-specific radiological analysis has been performed to assess the affects of the proposed change in the annulus bypass leakage release pathway in terms of Control Room and off-site doses following a postulated design basis LOCA. The proposed change required a revision to the existing LOCA dose analysis since the annulus bypass leakage release is assumed to be directly to the environment due to removal of the Fuel Building from the Secondary Containment boundary. The calculated doses for all offsite and onsite evaluation points are within the 10 CFR Part 100 criteria for offsite doses and within the General Design Criterion 19 of 10 CFR Part 50 for the Control Room.

The proposed changes to the Technical Specification requirements for the fuel building and the fuel building ventilation system when handling irradiated fuel in the fuel building are bounded by currently approved FHA analyses.

Therefore, there is no significant reduction in the margin of safety associated with postulated design basis events at RBS in allowing the proposed change to the RBS licensing basis.

Therefore, as discussed above, the proposed amendment to the Technical Specifications does not involve a significant hazard consideration.

Attachment 1

Commitment Identification Form

Commitment Identification Form

COMMITMENT	ONE-TIME ACTION*	CONTINUING COMPLIANCE*
None		

*Check one only

Attachment 2

River Bend Station

Proposed
Technical Specification Changes

3.3 INSTRUMENTATION

and Fuel Building

3.3.6.2 Secondary Containment ^ Isolation Instrumentation

LCO 3.3.6.2 The ~~secondary containment~~ isolation instrumentation for each Function in Table 3.3.6.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6.2-1.

ACTIONS

------------------------------------NOTE------------------------------------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Place channel in trip.	12 hours for Function 2 AND 24 hours for Functions other than Function 2
B. One or more automatic Functions with secondary containment [or Fuel Building] isolation capability not maintained.	B.1 Restore ^ [the applicable] ~~secondary containment~~ isolation capability.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1.1 Isolate the associated penetration flow path(s). OR	1 hour

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.1.2 Declare associated isolation dampers inoperable.	1 hour
	<u>AND</u>	
	C.2.1 Place the associated ventilation subsystem in operation.	1 hour
	<u>OR</u>	
	C.2.2 Declare associated ventilation subsystem inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTES-----------------------------------

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each ~~Secondary Containment~~ Isolation Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains secondary containment isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.3	Calibrate the trip unit.	92 days
SR 3.3.6.2.4	Perform CHANNEL CALIBRATION.	18 months
SR 3.3.6.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	18 months

Table 3.3.6.2-1 (page 1 of 1)
Secondary Containment ^ {and Fuel Building} Isolation Instrumentation

FUNCTION	APPLICABLE MODES AND OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low, Level 2	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≥ -47 inches
2. Drywell Pressure – High	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 1.88 psid
3. Fuel Building Ventilation Exhaust Radiation – High (1RMS*RE5A)	(a)	1	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	$\leq 2.18 \times 10^{3}$ μCi/sec
4. Fuel Building Ventilation Exhaust Radiation – High (1RMS*RE5B)	(a)	1	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	$\leq 7.05 \times 10^{-4}$ μCi/cc
5. Manual Initiation	1,2,3, (a)	2	SR 3.3.6.2.5	NA

(a) During movement of ^ {recently} irradiated fuel assemblies in the fuel building for fuel building isolation.

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment—Operating

LCO 3.6.4.1 The shield building, auxiliary building, ~~and fuel building~~ shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable.	A.1 Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify shield building annulus, auxiliary building, ~~and fuel building~~ vacuum is ≥ 3.0, ~~≥ 0.0,~~ and ≥ 0.0 inch of vacuum water gauge, respectively.	24 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.2	Verify all secondary containment equipment hatches are closed and sealed and loop seals filled.	31 days
SR 3.6.4.1.3	Verify each secondary containment access door is closed, except when the access opening is being used for entry and exit.	31 days
SR 3.6.4.1.4	Verify each standby gas treatment (SGT) subsystem will draw down the shield building annulus and auxiliary building to $\geq$ 0.5 and $\geq$ 0.25 inch of vacuum water gauge in $\leq$ 18.5 and $\leq$ 13.5 seconds, respectively.	18 months on a STAGGERED TEST BASIS
SR 3.6.4.1.5	~~Verify each fuel building ventilation subsystem will draw down the fuel building to $\geq$ 0.25 inch of vacuum water gauge in $\leq$ 12.5 seconds.~~ Deleted	~~18 months on a STAGGERED TEST BASIS~~ Not Applicable
SR 3.6.4.1.6	Verify each SGT subsystem can maintain $\geq$ 0.5 and $\geq$ 0.25 inch of vacuum water gauge in the shield building annulus and auxiliary building, respectively, for 1 hour.	18 months on a STAGGERED TEST BASIS
SR 3.6.4.1.7	~~Verify each fuel building ventilation subsystem can maintain $\geq$ 0.25 inch of vacuum water gauge in the fuel building for 1 hour.~~ Deleted	~~18 months on a STAGGERED TEST BASIS~~ Not Applicable

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Dampers (SCIDs) and Fuel Building Isolation Dampers (FBIDs)

LCO 3.6.4.2 Each SCID and FBID shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 for secondary containment isolation,
During movement of recently irradiated fuel assemblies in the fuel building for fuel building isolation.

ACTIONS

-----NOTES-----

1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by SCIDs or FBIDs.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more penetration flow paths with one SCID or FBID inoperable.	A.1	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic damper, closed manual damper, or blind flange.	8 hours
	<u>AND</u>		

(continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	--------NOTE--------- Isolation devices in high radiation areas may be verified by use of administrative means. --------------------- Verify the affected penetration flow path is isolated.	 Once per 31 days
B. One or more penetration flow paths with two SCIDs or two FBIDs inoperable.	B.1	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic damper, closed manual damper, or blind flange.	4 hours
C. Required Action and associated Completion Time of Condition A or B not met for SCIDs in MODE 1, 2, or 3.	C.1 AND C.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours
D. Required Action and associated Completion Time of Condition A or B not met for FBIDs during movement of recently irradiated fuel assemblies in the fuel building.		-------------NOTE------------ LCO 3.0.3 is not applicable. -----------------------------	
	D.1	Suspend movement of recently irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each required power operated automatic SCID and FBID is within limits.	92 days
SR 3.6.4.2.2	Verify each required automatic SCID and FBID actuates to the isolation position on an actual or simulated automatic isolation signal.	18 months

3.6 CONTAINMENT SYSTEMS

3.6.4.5 Fuel Building

LCO 3.6.4.5 The fuel building shall be OPERABLE.

APPLICABILITY: During movement of {recently} irradiated fuel assemblies in the fuel building.

ACTIONS

-----NOTE-----
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel building inoperable.	A.1 Suspend movement of {recently} irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.5.1	Verify fuel building vacuum is ≥ 0.25 inch of vacuum water gauge.	24 hours
SR 3.6.4.5.2	Verify all fuel building equipment hatch covers are installed.	31 days
SR 3.6.4.5.3	Verify each fuel building access door is closed, except when the access opening is being used for entry and exit.	31 days

3.6 CONTAINMENT SYSTEMS

3.6.4.6 Fuel Building Ventilation System—Operating

Deleted

LCO 3.6.4.6 Two fuel building ventilation charcoal filtration subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One fuel building ventilation charcoal filtration subsystem inoperable.	A.1	Restore fuel building ventilation charcoal filtration subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.6.1	Operate each fuel building ventilation charcoal filtration subsystem for ≥ 10 continuous hours with heaters operating.	31 days
SR 3.6.4.6.2	Perform required fuel building ventilation charcoal filtration filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.6.3	Verify each fuel building ventilation charcoal filtration subsystem actuates on an actual or simulated initiation signal.	18 months
SR 3.6.4.6.4	Verify each fuel building ventilation charcoal filtration filter cooling bypass damper can be opened and the fan started.	18 months

3.6 CONTAINMENT SYSTEMS

3.6.4.7 Fuel Building Ventilation System - Fuel Handling

LCO 3.6.4.7 Two fuel building ventilation charcoal filtration subsystems shall be OPERABLE and one shall be operating in emergency mode.

APPLICABILITY: During movement of {recently} irradiated fuel assemblies in the fuel building.

ACTIONS

-------------------------------NOTE-------------------------------

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One fuel building ventilation charcoal filtration subsystem inoperable.	A.1 Restore fuel building ventilation charcoal filtration subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met. OR Two fuel building ventilation charcoal filtration subsystems inoperable. OR One fuel building ventilation charcoal filtration subsystem not in operation.	B.1 Suspend movement of {recently} irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.7.1	Verify one fuel building ventilation charcoal filtration subsystem in operation.	12 hours
SR 3.6.4.7.2	Operate each fuel building ventilation charcoal filtration subsystem for ≥ 10 continuous hours with heaters operating.	31 days
SR 3.6.4.7.3	Perform fuel building ventilation charcoal filtration filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.7.4	Verify each fuel building ventilation charcoal filtration subsystem actuates on an actual or simulated initiation signal.	18 months
SR 3.6.4.7.5	Verify each fuel building ventilation charcoal filtration filter cooling bypass damper can be opened and the fan started.	18 months

3.10 SPECIAL OPERATIONS

3.10.1 Inservice Leak and Hydrostatic Testing Operation

LCO 3.10.1 The average reactor coolant temperature specified in Table 1.1-1 for MODE 4 may be changed to "NA," and operation considered not to be in MODE 3; and the requirements of LCO 3.4.10, "Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown," may be suspended, to allow performance of an inservice leak or hydrostatic test provided the following MODE 3 LCOs are met:

a. LCO 3.3.6.2, "Secondary Containment (and Fuel Building) Isolation Instrumentation," Functions 1, 2, ~~3, 4,~~ 5, (and) 6 of Table 3.3.6.2-1;

b. LCO 3.6.4.1, "Secondary Containment—Operating";

c. LCO 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs) (and Fuel Building Isolation Dampers (FBIDs))";

d. LCO 3.6.4.3, "Standby Gas Treatment (SGT) System";

e. LCO 3.6.4.4, "Annulus Mixing System"; (and)

f. LCO 3.6.4.5, "Fuel Building"; ~~and~~

~~g. LCO 3.6.4.6, "Fuel Building Ventilation System—Operating."~~

APPLICABILITY: MODE 4 with average reactor coolant temperature > 200°F.

Attachment 3

River Bend Station

Proposed
Technical Specification Bases Changes

B 3.3 INSTRUMENTATION

and Fuel Building

B 3.3.6.2 Secondary Containment Isolation Instrumentation

BASES

BACKGROUND

The secondary containment isolation instrumentation automatically initiates closure of appropriate secondary containment isolation dampers (SCIDs) and starts appropriate ventilation subsystems. Insert A The function of these systems, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs) (Ref. 1), such that offsite radiation exposures are maintained within the requirements of 10 CFR 100 that are part of the NRC staff approved licensing basis. Secondary containment isolation and establishment of vacuum within the assumed time limits ensures that fission products that leak from primary containment following a DBA, or are released outside primary containment or during certain operations when primary containment is not required to be OPERABLE are maintained within applicable limits. Insert B

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of secondary containment isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs an ~~secondary containment~~ isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logic are (a) reactor vessel water level, (b) drywell pressure, and (c) fuel building ventilation exhaust radiation. Redundant sensor input signals from each parameter are provided for initiation of isolation parameters. In addition, manual initiation of the logic is provided.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The isolation signals generated by the secondary containment isolation instrumentation are implicitly assumed in the safety analyses of References 1 and 2 to initiate closure of dampers and start appropriate ventilation subsystems to limit offsite doses. Insert C

(continued)

TECHNICAL SPECIFICATION B 3.3.6.2
Page B 3.3-170

INSERT A

Similarly, the fuel building isolation instrumentation automatically initiates closure of appropriate fuel building isolation dampers (FBIDs) and initiates fuel building ventilation flow through the filtration system.

INSERT B

Fuel building isolation ensures that fission products released due to fuel uncovery or a dropped fuel assembly are also maintained within regulatory limits.

INSERT C

The isolation signals generated by the fuel building isolation instrumentation ensure that the ventilation system is properly aligned for filtration to limit offsite doses.

BASES

and Fuel Building Isolation Dampers (FBIDs)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Refer to LCO 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs)," and LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," Applicable Safety Analyses Bases for more detail of the safety analyses.

The secondary containment isolation instrumentation satisfies Criterion 3 of the NRC Policy Statement. Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

and fuel building isolation instrumentation

The OPERABILITY of the ~~secondary containment~~ isolation instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions. Each Function must have the required number of OPERABLE channels with their setpoints set within the specified Allowable Values, as shown in Table 3.3.6.2-1. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. Each channel must also respond within its assumed response time, where appropriate.

Allowable Values are specified for each Function specified in the Table. Nominal trip setpoints are specified in setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Values between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable.

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In general, the individual Functions are required to be OPERABLE in the MODES or other specified conditions when SCIDs, FBIDs and the SGT System are required.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1. Reactor Vessel Water Level—Low Low, Level 2

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite dose release. The Reactor Vessel Water Level—Low Low, Level 2 Function is one of the Functions assumed to be OPERABLE and capable of providing isolation and initiation signals. The isolation and initiation of systems on Reactor Vessel Water Level—Low Low, Level 2 support actions to ensure that any offsite releases are within the limits calculated in the safety analysis.

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value was chosen to be the same as the High Pressure Core Spray (HPCS)/Reactor Core Isolation Cooling (RCIC) Reactor Vessel Water Level—Low Low, Level 2 Allowable Value (LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," and LCO 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation"), since this could indicate the capability to cool the fuel is being threatened.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Reactor Vessel Water Level—Low Low, Level 2 (continued)

The Reactor Vessel Water Level—Low Low, Level 2 Function is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the Reactor Coolant System (RCS); thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, this Function is not required.

2. Drywell Pressure—High

High drywell pressure can indicate a break in the reactor coolant pressure boundary (RCPB). An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite dose release. The isolation of high drywell pressure supports actions to ensure that any offsite releases are within the limits calculated in the safety analysis. However, the Drywell Pressure—High Function associated with isolation is not assumed in any USAR accident or transient analysis. It is retained for the secondary containment isolation instrumentation as required by the NRC approved licensing basis.

High drywell pressure signals are initiated from pressure transmitters that sense the pressure in the drywell. Four channels of Drywell Pressure—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value was chosen to be the same as the ECCS Drywell Pressure—High Function Allowable Value (LCO 3.3.5.1) since this is indicative of a loss of coolant accident.

The Drywell Pressure—High Function is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the RCS; thus, there is a probability of pipe breaks resulting in significant releases of radioactive

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2. Drywell Pressure—High (continued)

steam and gas. This Function is not required in MODES 4 and 5 because the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES.

3 and 4. Fuel Building Ventilation Exhaust Radiation—High

High [Fuel building] ~~secondary containment~~ exhaust radiation is an indication of possible gross failure of the fuel cladding. The release may have originated from the primary containment due to a break in the RCPB or the fuel building due to a fuel handling accident. When Exhaust Radiation—High is detected, [fuel building] ~~secondary containment~~ isolation and actuation of the associated ventilation [filtration] system are initiated to limit the release of fission products as assumed in the USAR safety analyses (Ref. 1).

The Exhaust Radiation—High signals are initiated from radiation detectors that are located on the ventilation exhaust duct coming from the fuel building ventilation. The signal from each detector is input to an individual monitor whose trip outputs are assigned to an isolation channel.

The Allowable Values are chosen to promptly detect gross failure of the fuel cladding.

The Exhaust Radiation—High Function is required to be OPERABLE during movement of [recently] irradiated fuel assemblies in the fuel building because the capability of detecting radiation releases due to fuel failures (due to fuel uncovery or dropped fuel assemblies) must be provided to ensure that offsite dose limits are not exceeded.

"Recently irradiated fuel" is fuel that has occupied part of a critical reactor core within the previous 11 days.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

5. Manual Initiation

The Manual Initiation push button channels introduce signals into the secondary containment and fuel building isolation logic that are redundant to the automatic protective instrumentation channels, and provide manual isolation capability. There is no specific USAR safety analysis that takes credit for this Function. It is retained for the ~~secondary containment~~ isolation instrumentation as required by the NRC approved licensing basis.

There are four push buttons for the logic, two manual initiation push buttons per trip system. There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

Four channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3 ~~and during movement of irradiated fuel assemblies in the fuel building~~, since these are the MODES and other specified conditions in which the Secondary Containment Isola~~tion automatic~~ Functions are required to be OPERABLE. Moving recently irradiated fuel assemblies in the fuel building ~~(the only portion of secondary containment in which fuel can be handled)~~ requires only that portion of the Manual Initiation Function associated with the fuel building to be OPERABLE.

ACTIONS

A Note has been provided to modify the ACTIONS related to ~~secondary containment~~ isolation instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable secondary containment isolation instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable ~~secondary containment~~ isolation instrumentation channel.

(continued)

BASES

ACTIONS (continued)

A.1

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours or 24 hours, depending on the Function, has been shown to be acceptable (Refs. 3 and 4) to permit restoration of any inoperable channel to OPERABLE status. Functions that share common instrumentation with the RPS have a 12 hour allowed out of service time consistent with the time provided for the associated RPS instrumentation channels. This out of service time is only acceptable provided the associated Function is still maintaining isolation capability (refer to Required Action B.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation), Condition C must be entered and its Required Actions taken.

B.1

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic isolation capability for the associated penetration flow path(s) or a complete loss of automatic initiation capability for the various ventilation subsystems. A Function is considered to be maintaining ~~secondary containment~~ isolation capability when sufficient channels are OPERABLE or in trip, such that one trip system will generate a trip signal from the given Function on a valid signal. This ensures that one of the two SCIDs or FBIDs in the associated penetration flow path and one ventilation subsystem can be initiated on an isolation signal from the given Function. For the Functions with two two-out-of-two logic trip systems (Functions 1 and 2), this would require one trip system to have two channels, each OPERABLE or in trip. The Condition does not include the Manual Initiation Function (Function 5), since it is not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action A.1) is allowed.

(continued)

BASES

ACTIONS (continued)

C.1.1, C.1.2, C.2.1, and C.2.2

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

If any Required Action and associated Completion Time of Condition A or B are not met, the ability to isolate the associated secondary containment or fuel building and start the associated ventilation subsystems cannot be ensured. Therefore, further actions must be performed to ensure the ability to maintain the secondary containment function. Isolating the associated penetration flow path(s) and starting the associated ventilation subsystems (Required Actions C.1.1 and C.2.1) performs the intended function of the instrumentation and allows operations to continue.

Alternatively, declaring the associated SCIDs, or FBIDs or associated ventilation subsystem inoperable (Required Actions C.1.2 and C.2.2) is also acceptable since the Required Actions of the respective LCOs (LCO 3.6.4.2, LCO 3.6.4.3, LCO 3.6.4.4, ~~LCO 3.6.4.6~~, and LCO 3.6.4.7) provide appropriate actions for the inoperable components.

One hour is sufficient for plant operations personnel to establish required plant conditions or to declare the associated components inoperable without challenging plant systems.

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each ~~Secondary Containment~~ Isolation instrumentation Function are located in the SRs column of Table 3.3.6.2-1.

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains secondary containment isolation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Action(s) taken.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

This Note is based on the reliability analysis (Refs. 3 and 4) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the SCIDs will isolate the associated penetration flow paths and the associated ventilation subsystems will initiate when necessary.

SR 3.3.6.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated parameter for one instrument channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.6.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.2 (continued)

Any setpoint adjustment shall be left set consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based upon the reliability analysis of References 3 and 4.

SR 3.3.6.2.3

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.2-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of References 3 and 4.

SR 3.3.6.2.4

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.1 Secondary Containment—Operating

BASES

BACKGROUND

The function of the secondary containment is to contain, dilute, and hold up fission products that may leak from primary containment following a Design Basis Accident (DBA). In conjunction with operation of the Standby Gas Treatment (SGT) System, ~~Fuel Building Ventilation Systems,~~ and closure of certain valves whose lines penetrate the secondary containment, the secondary containment is designed to reduce the activity level of the fission products prior to release to the environment and to isolate and contain fission products that are released during certain operations that take place inside primary containment, when primary containment is not required to be OPERABLE, or that take place outside primary containment.

The secondary containment consists of the shield building, and auxiliary building, ~~and fuel building,~~ and completely encloses the primary containment and those components that may be postulated to contain primary system fluid. This structure forms a control volume that serves to hold up and dilute the fission products. It is possible for the pressure in the control volume to rise relative to the environmental pressure (e.g., due to pump/motor heat load additions). To prevent ground level exfiltration while allowing the secondary containment to be designed as a conventional structure, the secondary containment requires support systems to maintain the control volume pressure at less than the external pressure. Requirements for these systems are specified separately in LCO 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs) and Fuel Building Isolation Dampers (FBIDs)," and LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," ~~LCO 3.6.4.4, "Shield Building Annulus Mixing System,"~~ ~~and LCO 3.6.4.5, "Fuel Building."~~

The isolation devices for the penetrations in the secondary containment boundary are a part of the secondary containment barrier. To maintain this barrier:

a. All Auxiliary Building penetrations, ~~Fuel Building penetrations~~ and Shield Building annulus penetrations required to be closed during accident conditions are either:

(continued)

BASES

BACKGROUND (continued)

1. Capable of being closed by an OPERABLE secondary containment automatic isolation signal, or

2. Closed by at least one manual valve, blind flange, or deactivated automatic valve or damper, as applicable, secured in its closed position, except as provided in LCO 3.6.4.2;

b. All Auxiliary Building, ~~Fuel Building~~ and Shield Building Annulus equipment hatches are closed and sealed;

c. The Standby Gas Treatment System is OPERABLE, except as provided in LCO 3.6.4.3; and

~~d. The Fuel Building Charcoal Filtration System is OPERABLE, except as provided in LCO 3.6.4.6; and~~

d. ~~e.~~ At least one door in each access to the Auxiliary Building, ~~Fuel Building~~ and Shield Building Annulus is closed, except for routine entry and exit of personnel and equipment.

APPLICABLE SAFETY ANALYSES

The ~~There are two~~ principal accident~~s~~ for which credit is taken for secondary containment OPERABILITY is a ~~. These are a~~ LOCA (Ref. 1) ~~and a fuel handling accident in the fuel building (Ref. 2)~~. The secondary containment performs no active function in response to this ~~each of these~~ limiting event~~s~~; however, its leak tightness is required to ensure that the release of radioactive materials from the primary containment is restricted to those leakage paths and associated leakage rates assumed in the accident analysis, and that fission products entrapped within the secondary containment structures will be treated by the SGT System ~~or Fuel Building Ventilation System~~ prior to discharge to the environment.

Secondary containment—operating satisfies Criterion 3 of the NRC Policy Statement.

LCO

An OPERABLE secondary containment provides a control volume into which fission products that bypass or leak from primary containment, or are released from the reactor coolant pressure boundary components located in the shield building, or

(continued)

BASES

LCO (continued)

auxiliary building, ~~or fuel building,~~ can be diluted and processed prior to release to the environment. For the secondary containment to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained.

APPLICABILITY

In MODES 1, 2, and 3, a LOCA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, secondary containment OPERABILITY is required during the same operating conditions that require primary containment OPERABILITY.

In MODES 4 and 5, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5 to ensure a control volume, except for other situations for which significant releases of radioactive material can be postulated, such as during movement of irradiated fuel assemblies in the fuel building. The fuel building OPERABILITY during irradiated fuel handling is addressed in LCO 3.6.4.7, "Fuel Building Ventilation Systems—Fuel Handling."

ACTIONS

A.1

If secondary containment is inoperable, it must be restored to OPERABLE status within 4 hours. The 4 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring secondary containment OPERABILITY) occurring during periods where secondary containment is inoperable is minimal.

B.1 and B.2

If the secondary containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.1

This SR ensures that the shield building annulus and auxiliary building~~, and fuel building boundary~~ is sufficiently leak tight to preclude exfiltration under expected wind conditions. The 24 hour Frequency of this SR was developed based on operating experience related to secondary containment vacuum variations during the applicable MODES and the low probability of a DBA occurring between surveillances.

Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal secondary containment vacuum condition.

SR 3.6.4.1.2 and SR 3.6.4.1.3

Verifying that secondary containment equipment hatches are closed/installed and access doors are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the secondary containment will not occur. In this application the term "sealed" has no connotation of leak tightness, rather inadvertent opening is prevented. Maintaining secondary containment OPERABILITY requires verifying each door in the access opening is closed, except when the access opening is being used for entry and exit. Verifying the main plant exhaust duct drain loop seal and the turbine building/auxiliary building exhaust duct drain loop seals are full of water also prevents infiltration of outside air and exfiltration from the secondary containment. The 31 day Frequency for these SRs has been shown to be adequate based on operating experience, and is considered adequate in view of the other controls on secondary containment access openings.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.4 and SR 3.6.4.1.6

The SGT System exhausts the shield building annulus and auxiliary building atmosphere to the environment through appropriate treatment equipment. To ensure that all fission products are treated, SR 3.6.4.1.4 verifies that the SGT System will rapidly establish and maintain a pressure in the shield building annulus and auxiliary building that is less than the lowest postulated pressure external to the secondary containment boundary. This is confirmed by demonstrating that one SGT subsystem will draw down the shield building annulus and auxiliary building to ≥ 0.5 and ≥ 0.25 inches of vacuum water gauge in ≤ 18.5 and ≤ 13.5 seconds, respectively. This cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.6 demonstrates that each SGT subsystem can maintain ≥ 0.5 and ≥ 0.25 inches of vacuum water gauge for 1 hour. The 1 hour test period allows shield building annulus and auxiliary building to be in thermal equilibrium at steady state conditions. Therefore, these two tests are used to ensure the integrity of this portion of the secondary containment boundary. Since these SRs are secondary containment tests, they need not be performed with each SGT subsystem. The SGT subsystems are tested on a STAGGERED TEST BASIS, however, to ensure that in addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.4.1.5 and SR 3.6.4.1.7

Deleted

The Fuel Building Ventilation System exhausts the fuel building atmosphere to the environment through appropriate treatment equipment. To ensure that all fission products are treated, SR 3.6.4.1.5 verifies that the Fuel Building Ventilation System will rapidly establish and maintain a pressure in the fuel building that is less than the lowest postulated pressure external to the secondary containment boundary. This is confirmed by demonstrating that one fuel building ventilation subsystem will draw down the fuel building to ≥ 0.25 inches of vacuum water gauge in ≤ 12.5 seconds. This cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.7

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.5 and SR 3.6.4.1.7 (continued)

Deleted

demonstrates that each SGT subsystem can maintain ≥ 0.25 inches of vacuum water gauge for 1 hour. The 1 hour test period allows the fuel building to be in thermal equilibrium at steady state conditions. Therefore, these two tests are used to ensure the integrity of this portion of the secondary containment boundary. Since these SRs are secondary containment tests, they need not be performed with each SGT subsystem. The SGT subsystems are tested on a STAGGERED TEST BASIS, however, to ensure that in addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. USAR, Section 15.6.5.
2. USAR, Section 15.7.4.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.2 Secondary Containment Isolation Dampers (SCIDs) and Fuel Building Isolation Dampers (FBIDs)

BASES

BACKGROUND

The function of the SCIDs and FBIDs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs) (Ref. 1). Secondary containment isolation within the time limits specified for those isolation dampers designed to close automatically ensures that fission products that leak from primary containment following a DBA, that are released during certain operations when primary containment is not required to be OPERABLE, or that take place outside primary containment, are maintained within the secondary containment boundary. Insert D

The OPERABILITY requirements for SCIDs and FBIDs help ensure that an adequate secondary containment boundary is maintained during and after an accident by minimizing potential paths to the environment. Isolation barrier(s) for the penetration are discussed in Reference 2. The isolation devices addressed by this LCO are either passive or active (automatic). Manual dampers, de-activated automatic dampers secured in their closed position, check dampers with flow through the damper secured, and blind flanges are considered passive devices. Check dampers and other automatic dampers designed to close without operator action following an accident are considered active devices.

Automatic SCIDs close on a secondary containment isolation signal to establish a boundary for untreated radioactive material within secondary containment following a DBA, ~~or other accidents.~~ Insert E

Other penetrations are isolated by the use of dampers or valves in the closed position or blind flanges.

APPLICABLE SAFETY ANALYSES

The SCIDs and FBIDs must be OPERABLE to ensure the ~~secondary containment~~ barrier to fission product releases is established. The principal accidents for which the secondary containment boundary is required ~~are~~ is a loss of coolant accident (Ref. 1). ~~and a fuel handling accident in the fuel building (Ref. 3).~~ Insert F The secondary containment and fuel building do not perform ~~no~~ an active function in response to ~~each of~~ these

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

limiting events~~, but~~ the boundary established by SCIDs ~~is~~ required to ensure that ~~leakage from the primary containment is~~ processed ~~by~~ the ~~Standby Gas Treatment (SGT) System and a Fuel Building~~ Ventilation System before being released to the environment.

Maintaining SCIDs OPERABLE with isolation times within limits ensures that fission products will remain trapped inside secondary containment so that they can be treated by the SGT System or Fuel Building Ventilation System prior to discharge to the environment.

SCIDs satisfy Criterion 3 of the NRC Policy Statement.

LCO

SCIDs form a part of the secondary containment boundary. The SCID safety function is related to control of offsite radiation releases resulting from DBAs.

The power operated isolation dampers are considered OPERABLE when their isolation times are within limits. Additionally, power operated automatic dampers are required to actuate on an automatic isolation signal.

The normally closed isolation dampers or blind flanges are considered OPERABLE when manual dampers are closed or open in accordance with appropriate administrative controls, automatic dampers are de-activated and secured in their closed position, or blind flanges are in place. The SCIDs covered by this LCO, along with their associated stroke times, if applicable, are listed in Reference 4.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to the primary containment that leaks to the secondary containment. Therefore, OPERABILITY of SCIDs is required.

In MODES 4 and 5, the probability and consequences of these events are reduced due to pressure and temperature limitations in these MODES. Therefore, maintaining SCIDs OPERABLE is not required in MODE 4 or 5, except for other situations under which significant releases of radioactive material can be postulated, such as during movement of irradiated fuel assemblies. Moving irradiated fuel assemblies in the Primary Containment is addressed adequately in LCO 3.6.1.10, "Primary Containment—Shutdown."

(continued)

TECHNICAL SPECIFICATION B 3.6.4.2
Page B 3.6-89, 3.6-90

INSERT D

The fuel building isolation dampers that are designed to close automatically ensure that fission products following a fuel handling accident (FHA) are maintained within the fuel building boundary.

INSERT E

Similarly, automatic FBIDs close on a fuel building isolation signal to establish a boundary for untreated radioactive material within the fuel building following a FHA.

INSERT F

The principal accident for which the fuel building barrier is required is the fuel handling accident (FHA) in the fuel building (Ref. 3).

INSERT G

FBIDs form a part of the fuel building boundary. The FBID safety function is related to control of offsite radiation releases resulting from a fuel handling accident.

BASES

APPLICABILITY (continued)

Moving recently irradiated fuel assemblies in the fuel building ~~(the only portion of secondary containment in which fuel can be handled)~~ will require only the ~~SCIDs~~ FBIDs associated with the fuel building to be OPERABLE.

ACTIONS

The ACTIONS are modified by three Notes. The first Note allows penetration flow paths to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when the need for secondary containment isolation is indicated.

The second Note provides clarification that for the purpose of this LCO separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable SCID or FBID. Complying with the Required Actions may allow for continued operation, and subsequent inoperable SCIDs or FBID are governed by subsequent Condition entry and application of associated Required Actions.

The third Note ensures appropriate remedial actions are taken, if necessary, if the affected system(s) are rendered inoperable by an inoperable SCID or FBID.

A.1 and A.2

In the event that there are one or more penetration flow paths with one SCID or one FBID inoperable, the affected penetration flow path(s) must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criteria are a closed and de-activated automatic damper, a closed manual damper or a blind flange. For penetrations isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available device to the applicable isolation boundary ~~secondary containment~~. This Required Action must be completed within the 8 hour Completion Time. The specified time period is reasonable considering the time required to isolate the penetration and the low probability of a DBA, which requires the SCIDs or FBIDs to close, occurring during this short time.

(continued)

ACTIONS

A.1 and A.2 (continued)

For affected penetrations that have been isolated in accordance with Required Action A.1, the affected penetration must be verified to be isolated on a periodic basis. This is necessary to ensure that secondary containment penetrations required to be isolated following an accident, but no longer capable of being automatically isolated, will be isolated should an event occur. This Required Action does not require any testing or isolation device manipulation. Rather, it involves verification that the affected penetration remains isolated.

Required Action A.2 is modified by a Note that applies to isolation devices located in high radiation areas and allows them to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment once they have been verified to be in the proper position, is low.

B.1

With two SCIDs in one or more penetration flow paths inoperable (Condition A is entered if one SCID is inoperable in each of two penetrations), the affected penetration flow path must be isolated within 4 hours. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic damper, a closed manual damper, and a blind flange. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the low probability of a DBA, which requires the SCIDs to close, occurring during this short time.

C.1 and C.2

If any Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

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

D.1, D.2, and D.3

If any Required Action and associated Completion Time cannot be met, the plant must be placed in a condition in which the LCO does not apply. When applicable, movement of irradiated fuel assemblies in the fuel building must be immediately suspended. Suspension of this activity shall not preclude completion of movement of a component to a safe position.

Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

Verifying the isolation time of each required power operated automatic SCID is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCIDs will isolate in a time period less than or equal to that assumed in the safety analyses. The Frequency of this SR is 92 days.

SR 3.6.4.2.2

Verifying that each required automatic SCID closes on a ~~secondary containment~~ isolation signal is required to prevent leakage of radioactive material from secondary containment following a DBA or other accidents. This SR ensures that each automatic SCID will actuate to the isolation position on a secondary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.2 (continued)

during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES (continued)

REFERENCES

1. USAR, Section 15.6.5.
2. USAR, Section 6.2.3.
3. USAR, Section 15.7.4.
4. USAR, Table 6.2-40.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.5 Fuel Building

BASES

BACKGROUND

The function of the fuel building is to contain, dilute, and hold up fission products that are released from a design basis accident. In conjunction with operation of the Fuel Building Charcoal Filtration (FBCF) System and closure of certain valves whose lines penetrate the fuel building, the fuel building is designed to reduce the activity level of the fission products prior to release to the environment.

The fuel building is a structure that houses the spent fuel pool. This structure forms a control volume that serves to hold up and dilute the fission products. To prevent ground level exfiltration, the fuel building requires support systems to maintain the control volume pressure at less than the external pressure. Requirements for these systems are specified separately in LCO 3.6.4.2, "Secondary Containment Isolation Dampers (SCIDs)," and LCO 3.6.4.7, "Fuel Building Ventilation System - Fuel Handling."

APPLICABLE SAFETY ANALYSES

~~There are two~~ principal accidents for which credit is taken for the fuel building OPERABILITY. ~~These are a LOCA, and~~ a Fuel Handling Accident (FHA) inside the fuel building (Ref. 1). The fuel building performs no active function in response to ~~these~~ events; however, its leak tightness is required to ensure that the release of radioactive materials is restricted to those leakage rates assumed in the accident analysis.

The fuel building satisfies Criterion 3 of the NRC Policy Statement.

LCO

An OPERABLE fuel building provides a control volume into which fission products can be diluted and processed prior to release. For the fuel building to be considered OPERABLE, it must have adequate leak tightness to ensure the required vacuum can be established and maintained.

(continued)

BASES (continued)

APPLICABILITY

~~In plant operating MODES 1,2, and 3, OPERABILITY of the fuel building is addressed in LCO 3.6.4.1, "Secondary Containment — Operating."~~ Regardless of the plant operating MODE, anytime recently irradiated fuel is being handled there is the potential for a FHA and the fuel building OPERABILITY is required to mitigate the consequences.

ACTIONS

A.1

With the fuel building inoperable the plant must be brought to a condition in which the LCO does not apply since it is incapable of performing its required accident mitigation function. To achieve this, ~~irradiated fuel~~ handling of recently irradiated fuel (i.e., fuel that has occupied part of a critical core within the previous 11 days) must be suspended immediately. Suspension shall not preclude completion of fuel movement to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.5.1

This SR ensures that the fuel building boundary is sufficiently leak tight to preclude exfiltration under expected wind conditions. The 24 hour Frequency of this SR was developed based on operating experience related to fuel building vacuum variations during the applicable MODES and the low probability of a FHA occurring between surveillances.

Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal fuel building vacuum condition.

SR 3.6.4.5.2 and SR 3.6.4.5.3

Verifying that fuel building equipment hatch covers are installed and access doors are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the fuel building will not occur. Maintaining fuel building OPERABILITY requires verifying each door in the access opening is closed, except when the access opening is being used for entry and exit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.4.5.2 and SR 3.6.4.5.3 (continued) The 31 day Frequency for these SRs has been shown to be adequate based on operating experience, and is considered adequate in view of the other indications of door and hatch status that are available to the operator.
REFERENCES	1. USAR, Chapter 15.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.6 ~~Fuel Building Ventilation System—Operating~~ Deleted

BASES

BACKGROUND

The Fuel Building Ventilation System is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1). One function of the Fuel Building Ventilation System is to ensure that radioactive materials that leak from the primary containment into the Fuel Building portion of the secondary containment following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment.

The Fuel Building Ventilation System consists of two fully redundant fuel building ventilation charcoal filtration subsystems, each with its own set of ductwork, dampers, charcoal filter train, and controls. Each charcoal filter train consists of (components listed in order of the direction of the air flow):

a. A moisture separator;
b. An electric heater;
c. A prefilter;
d. A high efficiency particulate air (HEPA) filter;
e. A charcoal adsorber;
f. A second HEPA filter; and
g. A centrifugal fan.

The moisture separator is provided to remove entrained water in the air, while the electric heater reduces the relative humidity of the airstream to less than 70% (Ref. 2). The prefilter removes large particulate matter, while the HEPA filter is provided to remove fine particulate matter and protect the charcoal from fouling. The charcoal adsorber removes gaseous elemental iodine and organic iodides, and the final HEPA filter is provided to collect any carbon fines exhausted from the charcoal adsorber.

The Fuel Building Ventilation System automatically starts and operates the charcoal filtration subsystems in response to actuation signals indicative of a Fuel Handling Accident (FHA) or LOCA. Following initiation, both fuel building ventilation charcoal filtration fans start.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSIS	The design basis for the Fuel Building Ventilation System is to mitigate the consequences of a loss of coolant accident (Ref. 2). (Additionally this system functions to mitigate the FHA, however this function and Applicable Safety Analysis is addressed in LCO 3.7.9, "Fuel Building Ventilation System—Fuel Handling.") For the events analyzed, the fuel building ventilation charcoal filtration subsystems are shown to be automatically initiated to reduce, via filtration and adsorption, the radioactive material released to the environment. The fuel building charcoal filtration subsystems of the Fuel Building Ventilation System satisfies Criterion 3 of the NRC Policy Statement.
LCO	Following a DBA, a minimum of one fuel building ventilation charcoal filtration subsystem is required to maintain the fuel building at a negative pressure with respect to the environment and to process gaseous releases. Meeting the LCO requirements for two operable subsystems ensures operation of at least one fuel building ventilation charcoal filtration subsystem in the event of a single active failure.
APPLICABILITY	In MODES 1, 2, and 3, a DBA LOCA could lead to a fission product release to primary containment that leaks to secondary containment, including the fuel building. Therefore, fuel building ventilation charcoal filtration subsystem OPERABILITY is required during these MODES. In MODES 4 and 5, the probability and consequences of a DBA LOCA event is reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the fuel building ventilation charcoal filtration subsystems OPERABLE is not required in MODE 4 or 5, except for other situations under which significant releases of radioactive material can be postulated, such as during movement of irradiated fuel assemblies in the fuel building. The OPERABILITY of the Fuel Building Ventilation System during irradiated fuel handling is addressed in LCO 3.6.4.7, "Fuel Building Ventilation System—Fuel Handling."

(continued)

BASES (continued)

ACTIONS

A.1

With one fuel building ventilation charcoal filtration subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this condition, the remaining OPERABLE fuel building ventilation charcoal filtration subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant fuel building ventilation charcoal filtration subsystem and the low probability of a DBA occurring during this period.

B.1 and B.2

If the fuel building ventilation charcoal filtration subsystem cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.6.1

Operating each fuel building ventilation charcoal filtration subsystem for ≥ 10 continuous hours ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation with the heaters operating (automatic heater cycling to maintain temperature) for ≥ 10 continuous hours every 31 days eliminates moisture on the adsorbers and HEPA filters. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.6.2

This SR verifies that the required fuel building ventilation charcoal filtration filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The fuel building ventilation charcoal filtration subsystem filter tests are in accordance with Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specified test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.4.6.3

This SR requires verification that each fuel building ventilation charcoal filtration subsystem starts upon receipt of an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.4.6.4

This SR requires verification that the fuel building ventilation charcoal filtration filter cooling bypass damper can be opened and the fan started. This ensures that the ventilation mode of Fuel Building Ventilation Charcoal Filtration System operation is available. While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. USAR, Section 9.4.2.
3. Regulatory Guide 1.52, Rev. 2.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.7 Fuel Building Ventilation System—Fuel Handling

BASES

BACKGROUND

The Fuel Building Ventilation System is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1). The function of the Fuel Building Ventilation System is to ensure that radioactive materials that escape from fuel assemblies damaged following a design basis Fuel Handling Accident (FHA) are filtered and adsorbed prior to exhausting to the environment.

The Fuel Building Ventilation System consists of two fully redundant subsystems, each with its own set of ductwork, dampers, charcoal filter train, and controls.

Each charcoal filter train consists of (components listed in order of the direction of the air flow):

a. A moisture separator;

b. An electric heater;

c. A prefilter;

d. A high efficiency particulate air (HEPA) filter;

e. A charcoal adsorber;

f. A second HEPA filter; and

g. A centrifugal fan with inlet flow control vanes.

The moisture separator is provided to remove entrained water in the air, while the electric heater reduces the relative humidity of the airstream to less than 70% (Ref. 2). The prefilter removes large particulate matter, while the HEPA filter is provided to remove fine particulate matter and protect the charcoal from fouling. The charcoal adsorber removes gaseous elemental iodine and organic iodides, and the final HEPA filter is provided to collect any carbon fines exhausted from the charcoal adsorber.

(continued)

BASES

BACKGROUND (continued)

The Fuel Building Ventilation System automatically starts and operates in response to actuation signals indicative of conditions or an accident that could require operation of the system.

APPLICABLE SAFETY ANALYSES

The design basis for the Fuel Building Ventilation System is to mitigate the consequences of a fuel handling accident (Ref. 3). For all events analyzed, the Fuel Building Ventilation System is shown to reduce, via filtration and adsorption, the radioactive material released to the environment. Since the system is assumed to filter all releases, with the analysis not accounting for any delay in system startup, at least one ~~subsystem must be in operation~~ while handling recently irradiated fuel (i.e., fuel that has occupied part of a critical core within the previous 11 days).

The Fuel Building Ventilation System satisfies Criterion 3 of the NRC Policy Statement.

LCO

Following a FHA involving recently irradiated fuel, a minimum of one Fuel Building Ventilation subsystem is required to maintain the fuel building at a negative pressure with respect to the environment and to process gaseous releases. Meeting the LCO requirements for two operable subsystems ensures operation of at least one Fuel Building Ventilation subsystem in the event of a single active failure. Requiring one subsystem to be in operation ensures no releases occur that are not filtered and adsorbed.

APPLICABILITY

~~In plant operating MODES 1,2 and 3, OPERABILITY of the fuel building is addressed in LCO 3.6.4.1, "Secondary Containment—Operating."~~ Regardless of the plant operating MODE, anytime recently irradiated fuel (i.e., fuel that has occupied part of a critical core within the previous 11 days) is being handled there is the potential for a FHA and the Fuel Building Ventilation System is required to mitigate the consequences.

(continued)

BASES (continued)

ACTIONS

A.1

With one fuel building ventilation charcoal filtration subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE fuel building ventilation charcoal filtration subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant fuel building ventilation charcoal filtration subsystem and the low probability of a FHA occurring during this period.

B.1 and B.2

If the fuel building ventilation charcoal filtration subsystem cannot be restored to OPERABLE status within the required Completion Time the plant must be brought to a condition in which the LCO does not apply. Additionally, if both subsystems are inoperable or if the one required subsystem not in operation the system is incapable of performing its required accident mitigation function and the plant must be brought to a condition in which the LCO does not apply. To achieve this, irradiated fuel handling must be suspended immediately. Suspension shall not preclude completion of fuel movement to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.7.1

This Surveillance demonstrates that one fuel building ventilation charcoal filtration subsystem is in operation and filtering the fuel building atmosphere. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the fuel building ventilation charcoal filtration subsystem in the control room.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.7.2

Operating each fuel building ventilation charcoal filtration subsystem for ≥ 10 continuous hours ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation with the heaters operating (automatic heater cycling to maintain temperature) for ≥ 10 continuous hours every 31 days eliminates moisture on the adsorbers and HEPA filters. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.7.3

This SR verifies that the required fuel building ventilation charcoal filtration filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The fuel building ventilation charcoal filtration filter tests are in accordance with Regulatory Guide 1.52 (Ref. 4). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specified test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.4.7.4

This SR requires verification that each fuel building ventilation charcoal filtration subsystem starts upon receipt of an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.7.5

This SR requires verification that the fuel building ventilation charcoal filtration filter cooling bypass damper can be opened and the fan started. This ensures that the ventilation mode of Fuel Building Ventilation System operation is available. While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. USAR, Section 6.2.3.
3. USAR, Section 15.6.5.
4. Regulatory Guide 1.52, Rev. 2.

Attachment 4

River Bend Station

DBA LOCA Dose Analysis Discussion
For LAR 2000-02

Attachment 4
DBA LOCA Dose Analysis Discussion
For LAR 2000-02

Details of current accident analysis and model were previously provided to the NRC in License Amendment Request (LAR) 96-39, Change to Technical Specification 3.6.1.8, "Penetration Valve Leakage Control System (PVLCS)", RBG-43358, dated November 6, 1996. The Commission subsequently issued Amendment No. 98 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1 approving LAR 96-39 (Reference letter from David L. Wigginton, Senior Project Manager to John R. McGaha, Jr., dated August 26, 1997). Consequently, only the changes in the design basis LOCA dose analysis assumptions and modeling will be addressed in this Attachment.

The revised design basis LOCA dose assessment is identical to the previously submitted analysis except for the following:

1. Annulus bypass leakage
2. Power uprate power level
3. Annulus positive pressure period (PPP)
4. Liquid leakage directly to environment during the PPP

The revised analysis assumes that all annulus bypass leakage is released directly to the environment instead of being into either the Auxiliary Building, where the leakage would be treated by the SGTS, or into the Fuel Building, where the bypass leakage would be treated by the Fuel Building Ventilation System prior to release to the environment. The leakage which bypasses the containment annulus is limited by Technical Specification 3.6.1.3 "Primary Containment Isolation Valves (PCIVs)". The combined leakage rate is limited to 13,500 cc/hr for all required annulus bypass leakage paths when pressurized to P_a. Since credit for Fuel Building integrity is not taken, the annulus bypass leakage, at 13,500 cc/hr, is directly to the environment for the duration of the accident.

The power level assumed in the revised LOCA dose analysis is changed from 3039 MWt (105% of pre-Uprate power level) to 3100 MWt (102% of the Uprated power level).

The positive pressure period is a significant contributor to offsite and onsite doses since the containment leakage (at 0.26 %/day) is assumed to be directly to the environment during the positive pressure period. The positive pressure period has been reevaluated based on the RBS uprate power level. Power Uprate has an affect on many pieces of equipment in both primary and secondary containment. The increased system pressures and heat loads have a potentially nonconservative affect on the calculated annulus positive pressure period. Note that a building is at "positive" pressure when the pressure of the building is ≥ -0.25" w.g. with respect to the atmosphere (Ref. III.3). GE Task Report 31.2 (Ref. I.22) conservatively estimates that portions of secondary containment will have a PPP of 700 seconds post-LOCA (from 0 sec. to 700 sec.). EOI calculated that the positive pressure period for River Bend is less than 450 seconds for the annulus, which is the bounding secondary containment structure. Although the actual PPP is much less than that quoted in the GE report, the revised analysis conservatively assumed a PPP from 0 - 700 seconds under Power Uprate conditions since this is clearly conservative. The previous design basis analysis used a positive pressure period of 216 seconds.

An additional change from the current design basis LOCA dose analysis is the treatment of the dose contribution due to liquid leakage. The operational sequence for the ECCS systems following a DBA (initial cycle) is given in USAR Table 6.3-1. The HPCS design flow is reached at 30 seconds following the DBA. LPCI and LPCS reach rated flow at 56 seconds. According to SRP 15.6.5, Appendix B, Rev. 1, postulated ESF leakage is assumed to occur throughout the accident, starting at the earliest time that recirculation of contaminated fluid is initiated. Since LPCS and LPCI recirculate suppression pool water, contaminated liquid leakage from the containment is conservatively assumed to begin at 56 seconds post-LOCA. Since secondary containment is above -0.25 in. W.G. for the first 700 seconds of the accident, the ESF leakage is assumed to be directly to the environment during this time. After 700 seconds credit for secondary containment and filtration by SGTS is taken.

The key analysis parameters that are changed in the revised design basis LOCA analysis are listed below.

Key Analysis Parameters

Parameter	Value	Comments
Annulus bypass leakage	13,500 cc/hr	Released directly to the environment for duration of accident
Core Power Level[1]	3100 MWt	Core Uprate Power Level
Annulus Positive Pressure Period	700 sec	Conservative assumption compared to plant-specific value of ~450 seconds
Liquid leakage directly to environment	0-700 sec	Assumed based on Positive Pressure Period

[1] The projected power level increase due to the Power Uprate project is 105% of the current core thermal power. An additional 2% is added to account for instrument uncertainty in accordance with Regulatory Guide1.49 for a total assumed power level of 102%*105%*2984 MWt ≈ 3100 MWt.

The total LOCA Dose Consequences due to airborne and liquid releases are given below. The results without Fuel Building integrity post-LOCA are compared with the results from the current design basis LOCA calculation using the power uprate power level of 3100 MWt (EOI Calculation G13.18.9.5*51-1A).

TOTAL LOCA Dose Consequences

Receptor Location	Thyroid (Rem)	Whole Body (Rem)	Skin (Rem)
EAB			
New Design Basis[2]	**82.96**	**5.49**	
Current Design Basis with Power Uprate[3]	(80.6)	(5.4)	
Dose Limit	***300***	***25***	N/A
LPZ			
New Design Basis	**124.7**	**2.97**	
Current Design Basis with Power Uprate	(121.6)	(2.95)	
Dose Limit	***300***	***25***	N/A
Control Room			
New Design Basis	**8.17**	**0.46**	**9.55**
Current Design Basis with Power Uprate	(7.02)	(0.46)	(9.53)
Dose Limit	***30***	***5***	***30***

[2] 0-700 sec PPP, Power Uprate, Annulus Bypass Leakage to Environment

[3] EOI calculation G13.18.9.5*051-1A, 0-700 sec PPP, Power Uprate

The offsite doses increase by <3% due to releasing all annulus bypass leakage directly to the environment. The largest increase is to the LPZ doses since these are 30-day cumulative doses. For the LPZ dose, the largest increase is in the thyroid dose since the increase in untreated and unfiltered release has a more significant impact on the thyroid doses. The control room doses exhibit the largest percentage increase in the thyroid dose due to the increase in unfiltered and untreated iodine released to the environment, the release rate to the environment, and the changes in the control room atmospheric diffusion coefficient due to dual air intakes. However, the change in control room thyroid dose reduces the margin to the regulatory limit by only 4%. The calculated doses for all offsite and onsite evaluation points remain below the regulatory limit.

The following is a listing of the conservatisms identified in this analysis.

- Conservatively high core radionuclide inventory
- Use of 102% of Power Uprate power level (107% of current rated power) as required by Regulatory Guide 1.49
- Conservatively low suppression pool decontamination factor
- Use of minimum suppression pool volume for ESF Liquid Leakage dose calculation
- Use of conservatively high secondary containment bypass leakage rates
- No credit for decay in transit
- No credit for iodine ground deposition during transit
- Conservatively included IN 91-56 liquid leakage term
- Conservatively long positive pressure period
- No credit taken for partial treatment and filtration of annulus bypass leakage by the Operable Fuel Building Ventilation System
- Conservatively assumed that all annulus bypass leakage is directly to the environment without holdup or decay in the Fuel Building

Attachment 5

River Bend Station

FHA Dose Analysis Discussion
For LAR 2000-02

Attachment 5

FHA Dose Analysis Discussion
For LAR 2000-02

The details of the three Fuel Handling Accidents (FHA) scenarios were recently provided to the NRC in License Amendment Request (LAR) 99-29, "Revision to Fuel Handling Accident Dose Calculation" dated December 16, 1999. The Commission subsequently issued Amendment 110 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1 approving LAR 99-29 (Reference letter from Robert J. Fretz, Project Manager – Section 1, to Randall K. Edington dated March 2, 2000). This Attachment will address the impact to the design basis FHA scenarios contained in LAR 99-29.

The River Bend USAR currently documents three separate FHA scenarios. LAR 99-29 identifies them as follows:

Case I: FHA occurs in the Fuel Building 24 hours post-shutdown. This was the original licensing basis FHA analysis for River Bend Station. This analysis credits filtration by the fuel building ventilation system.

Case II: FHA occurs in containment during local leakage-rate testing (LLRT) testing, 80 hours post-shutdown. This analysis was originally performed to support Amendment 35. Credit is taken for primary containment, however, an additional 70.2 cfm of leakage is assumed to occur through up to 12 vent and drain lines. No credit is taken for the Standby Gas Treatment System.

Case III: FHA occurs in containment with the personnel airlock door open, 11 days post-shutdown. This evaluation was originally prepared to support Amendment 85. No credit is taken for primary containment, and neither is credit taken for the Standby Gas Treatment System.

The two analyses pertinent to the changes proposed here are Case I and Case III (Case II will no longer be discussed). The assumptions documented in LAR 99-29 are contained in the table below. The differences between the Case I and Case III analyses are rather limited. Specifically, the decay time differs, the building differs, the filter efficiency differs, and the release duration differs. Each of these is addressed below:

- **Decay Time:** The decay time proposed in this LAR is consistent with the 11 days used in Case III. Therefore, in this respect the Case III analysis bounds the potential conditions that may occur as a result of this LAR.

- **Building:** The change in the assumed building could potentially affect several factors. The most notable (other than those already identified) is the potential change in the atmospheric dispersion factors, or χ/Q's. However, as seen in Table 5-1 the χ/Q values for both analyses are identical, and therefore, the Case III analyses bounds the potential conditions which may occur as a result of this LAR.

- **Filter Efficiency:** Case I assumes that the Fuel Building Ventilation System is running in emergency mode consistent with TS LCO 3.6.4.7 requirements. As a result, a filter efficiency

- of 99% is assumed. The Case III analysis does not credit filtration by either the Fuel Building Ventilation System or the Standby Gas Treatment System. Since no filtration is assumed (i.e., a filter efficiency of 0%), the Case III analysis bounds the potential conditions which may occur as a result of this LAR.

- **Release Duration:** Case I assumes an instantaneous puff release of the activity directly to the environment. This is an extremely conservative assumption. Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors," requires that all fission products released to the building as a result of a fuel drop be released to the environment within two hours of the event. The 6000 volume % per day assumed in the Case III analysis meets Regulatory Guide 1.25 requirements[4].

  Per the River Bend USAR, the nominal flow rate for the Fuel Building Ventilation System is 10,000 cfm for both normal operation and in its emergency mode. USAR Table 15.6-5 indicates that the fuel building volume free volume is 742,000 ft^3. The volume transfer rate would then be

$$\frac{10{,}000\,{}^{ft^3}\!/_{min} \times 60\,{}^{min}\!/_{hr} \times 24\,{}^{hr}\!/_{day}}{742{,}000 ft^3} \times 100 = 1941\,{}^{volume\%}\!/_{day}$$

  The 6000 volume % per day clearly bounds the actual anticipated release rate from the building. Therefore, in this respect the Case III analysis bounds the potential conditions which may occur as a result of this LAR.

Based on the discussion above, it is clear that the Case III analysis, which was recently reviewed by the NRC, bounds a potential FHA in the Fuel Building, 11 days post-accident, with the ventilation system operating in normal rather than emergency mode. The results of the Case III analysis are contained in Table 5-2. The off-site dose consequences due to a FHA are "well within" 10CFR100 limits as required by the U.S. NRC Standard Review Plan, Section 15.7.4. Also, the dose consequences to Main Control Room operators meet 10CFR50, Appendix A, General Design Criterion 19.

Following is a list of known conservatisms in the Fuel Handling Accident Case III analysis (as it pertains to the Fuel Building):

- A power level of 3100 MWt is assumed. This corresponds to the projected Power Uprate power level of 3039 MWt (105% of the current rated power) plus an additional 2% to account for instrument uncertainty.

- No credit taken for filtration

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[4] Note that due to code limitations there is a finite amount of activity remaining in the containment building (or fuel building) at the end of 2 hours. However, this release rate meets the intent of the Regulatory Guide since >99% is released using this release rate. To ensure all activity is released, a puff release of the remaining <1% of activity is assumed at 2 hours after the drop of the fuel assembly.

- Conservatively assumed 150 GE 9x9 rods fail. Current estimates for the Fuel Building indicate a maximum of 103 GE 9x9 rods would be damaged as a result of a drop of a fuel assembly in the Fuel Building.
- No credit for decay in transit.
- No credit for iodine ground deposition during transit.
- Conservatively assumed a Radial Peaking Factor of 1.65 in lieu of the 1.5 required by Regulatory Guide 1.25.
- Conservatively assumed gap fractions corresponding to extended burnup fuel.

Table 5-1

FHA Input Assumptions (As documented in LAR 99-29)

Parameter	Case I	Case II (Amendment 35)	Case III (Amendment 85)
BUILDING	Fuel Building	N/A	Containment
Core Power Level[1]	3100 MWt		3100 MWt
Number of Rods per Bundle	74		74
Number of Bundles in Core	624		624
Decay Time	24 hr.		11 days
Number of Damaged Rods	150 GE9x9		150 GE9x9
Release Rate[2]	Puff Release		6000 $^{vol.\ \%}/_{day}$
Building Filter Efficiency	99%		0%
Pool Decontamination Factor			
Halogens	100		100
Noble Gases	1		1
Off-Site Atmospheric Dispersion Factors[χ/Q] ($^s/_{m^3}$)			
EAB			
0 – 2 hours	8.58E-04		8.58E-04
LPZ			
0 – 8 hours	1.13E-04		1.13E-04
8 – 24 hours	7.89E-05		7.89E-05
1 – 4 days	3.65E-05		3.65E-05
4 – 30 days	1.21E-05		1.21E-05
Control Room χ/Q ($^s/_{m^3}$)[3]			
0 – 8 hours	1.62E-03		1.62E-03
8 – 24 hours	1.20E-03		1.20E-03
1 – 4 days	4.05E-04		4.05E-04
4 – 30 days	6.48E-05		6.48E-05
GAP FRACTIONS			
Kr-85	0.30		0.30
All Other Noble Gases	0.10		0.10
I-131	0.12		0.12
All Other Halogens	0.10		0.10

Note 1: The assumed power level corresponds to a Power Uprated core thermal power level of 3039 MWt. An instrument uncertainty of 2% is assumed in accordance with Regulatory Guide 1.78 for a total core power level of 1.02x3039=3100 MWt. The current licensed power level is 2894 MWt.

Note 2: Case I represents the most conservative assumption in that all activity is instantaneously released to the environment. The Case III release rate used ensures that the Regulatory Guide 1.25 two-hour release duration is met.

Note 3: The power uprate FHA analyses assumes a "operator action" at 20 minutes for Control Room personnel to manually select the most favorable air intake. Therefore, the χ/Q values presented in the Table are divided by four, beginning 20 minutes into the event, as allowed per SRP Section 6.4.

Table 5-2
Summary of Results - FHA

Dose (REM)	Case I (Fuel Bldg.)	Case III (Amend. 85)	Regulatory Limits
EAB			
• Whole Body	0.5	0.2	6
• Thyroid	1.9	67	75
LPZ			
• Whole Body	0.1	0.1	6
• Thyroid	0.3	8.8	75
Main Control Room			
• Whole Body	0.1	0.1	5
• Skin	1.7	0.4	30
• Thyroid	3.3	3.6	30