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Monticello Nuclear Generating Plant
Operated by Nuclear Management Company, LLC

April 26, 2002

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MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Response to NRC Request For Additional Information and
Supplemental License Amendment Request for Previously Submitted
Containment Systems License Amendment Request (TAC No. MB3706)

Reference 1: Nuclear Management Company, LLC Submittal of License Amendment Request for Monticello Nuclear Generating Plant Regarding Containment Systems, dated December 21, 2001.

Reference 2: Nuclear Regulatory Commission Request for Additional Information Related to License Amendment Request, dated March 27, 2002.

Reference 1 proposed Technical Specifications changes to Appendix A of Operating License DPR-22, for the Monticello Nuclear Generating Plant. The purpose of the License Amendment Request was to revise the Monticello Technical Specifications (TS) to clarify existing requirements, make wording improvements, revise existing Limiting Conditions for Operations (LCO) and Surveillance Requirements (SR), and add an additional TS LCO to the Monticello TS.

Reference 2 requested Nuclear Management Company to provide additional information in support of the license amendment request submitted by Reference 1.

Exhibit A provides Nuclear Management Company, LLC (NMC) response to the NRC's request for additional information and supplemental revisions and additional justification for the previously submitted License Amendment Request. Exhibit B provides a new set of marked-up Monticello Technical Specification pages that replaces the Exhibit B submitted in Reference 1 in its entirety. The originally submitted changes are identified by bold text, and the additional changes proposed by this submittal are identified by bold text in brackets.

2807 West County Road 75 • Monticello, Minnesota 55362-9637
Telephone: 763.295.5151 • Fax: 763.295.1454

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Exhibit C provides a new set of retyped Monticello Technical Specification pages that replace the Exhibit C submitted in Reference 1 in its entirety.

These changes provide additional clarifications to the Monticello TS change request submitted by Reference 1, and as such, the Determination of No Significant Hazards Consideration and Environmental Assessment submitted by the original letter dated December 21, 2001, are also applicable to this supplemental submittal.

Nuclear Management Company, LLC requests a period of up to 60 days following receipt of this license amendment to implement the changes.

If you have any questions regarding this response to Request for Additional Information and Supplemental License Amendment Request please contact Doug Neve, Licensing Manager, at (763) 295-1353.

Jeffrey S. Forbes
Site Vice President
Monticello Nuclear Generating Plant

Subscribed to and sworn before me this 26 day of april, 2002

Kathryn I Kleine
Notary

KATHRYN I. KLEINE
NOTARY PUBLIC - MINNESOTA
My Comm. Exp. Jan. 31, 2005

Attachments: Exhibit A – Response to Request for Additional Information and Supplemental Evaluation of Additional Proposed Changes to the Monticello Technical Specifications
Exhibit B - Revised Monticello Technical Specifications Pages Marked up With Additional Proposed Changes
Exhibit C - Revised Monticello Technical Specifications Pages

cc: Regional Administrator-III, NRC
NRR Project Manager, NRC
Sr. Resident Inspector, NRC
Minnesota Department of Commerce
J. Silberg, Esq

Exhibit A

Response to Request for Additional Information and Supplemental Evaluation of Additional Proposed Changes to the Monticello Technical Specifications

Supplemental License Amendment Request for Containment Systems Technical Specification Changes

By letter dated December 21, 2001 Nuclear Management Company, LLC requested revisions to Appendix A, Technical Specifications, for Operating License DPR-22, for the Monticello Nuclear Generating Plant.

By letter dated March 19, 2002 the NRC requested additional information in support of the License Amendment Request referenced above.

Below are the NRC questions from their March 19, 2002 letter and Nuclear Management Company responses.

NRC Question:

1. Change 2 in your December 21, 2001, submittal deals with clarifying the Action statements in current Technical Specification (CTS) 3.7.A. The change relocates CTS 3.7.A.6 to CTS 3.7.A.1 as proposed Technical Specification (PTS) 3.7.A.1.f; to CTS 3.7.A.3 as PTS 3.7.A.3.c; to CTS 3.7.A.4 as PTS 3.7.A.4.f; and to CTS 3.7.A.5 as PTS 3.7.A.5.d and rewords CTS 3.7.A.6 to specifically apply to CTS 3.7.A.5. The staff finds that the changes associated with CTS 3.7.A.1/PTS 3.7.A.1.f, CTS 3.7.A.3/PTS 3.7.A.3.c and CTS 3.7.A.4/ PTS 3.7.A.4.f are administrative type changes and the justification provided is acceptable. However, the changes associated with CTS 3.7.A.6/PTS 3.7.A.5.d are not administrative changes and have not been adequately justified. CTS 3.7.A.6 requires that if the requirements of CTS 3.7.A.5 are not met, the reactor shall be place in a Cold Shutdown condition within 24 hours. PTS 3.7.A.5.d requires the reactor to be place in a Hot Shutdown condition within 12 hours. No justification is provided for this Less Restrictive change of going from Cold Shutdown within 24 hours to Hot Shutdown within 12 hours. In addition, the justification provided for this change states that the change is similar to the requirements in NUREG-1433 "Standard Technical Specifications, General Electric Plants, BWR/4" (STS). Consistency or similarity to the STS is not an adequate justification for a change. Furthermore, the corresponding STS for CTS 3.7.A.5 is STS 3.6.3.3 which requires that the Reactor Thermal Power (RTP) be reduced to less than 15% RTP within 8 hours. **Comment:** Provide additional discussions and justifications for this Less Restrictive change. The discussion should justify the 12 hour Completion Time in the PTS as compared to the 8 hour Completion Time in the STS, as well as the change from Cold Shutdown within 24 hours to Hot Shutdown within 12 hours.

NMC Response:

The proposed revision to CTS 3.7.A.6 was considered a clarification. The CTS states "If the specifications of 3.7.A cannot be met, the reactor shall be placed in cold shutdown condition within 24 hours." Since the object of this change was to provide a specific action for each of the subsections of CTS 3.7.A renumbering and clarifying the wording in CTS 3.7.A.6 was required to provide a PTS that was applicable to PTS 3.7.A.5 only. As stated in the December 21, 2001 submittal for Change 2, "The changes provide specific action statements which provide for allowed time to place the reactor in a condition in which the LCO is no longer applicable." The wording change provided was the most appropriate for this specification.

This specification is only applicable when the reactor is in the run mode, so therefore when hot shutdown mode is achieved from the run mode the LCO would no longer be applicable and the operators will exit the LCO.

However, after careful consideration and review of the above question and comment, NMC has decided that it would be advantageous to modify the requirements of PTS 3.7.A.5. A revision to PTS 3.7.A.5.b is being proposed to reword this TS LCO to state:

> "Within the 24 hours after Thermal Power is > 15% Rated Thermal Power following startup, to 24 hours prior to reducing Thermal Power to < 15% Rated Thermal Power prior to the next scheduled reactor shutdown, the containment atmosphere oxygen concentration shall be reduced to less than 4% by volume, and maintained in this condition."

Additionally, this proposed change will also change PTS LCO 3.7.A.5.d to state:

> "If the requirements of 3.7.A.5 cannot be met, reduce Thermal Power to ≤ 15% RTP, within 8 hours."

This less restrictive change is acceptable because there is a very small difference in the amount of time that is allowed to inert the drywell. This change is justified, since the time allowed without an inerted drywell is only increased slightly, and the fact that at low power levels, hydrogen generation is very small compared to higher power levels. The 8 hours to reduce Thermal Power to less than or equal to 15% Rated Thermal Power is acceptable, because based on industry experience this is a reasonable amount of time for operations personnel to perform a control reduction in power to this power level under the circumstances.

Associated changes to the Monticello TS pages 165 and 166 have been made and are attached in Exhibit A. Associated Bases changes have also been made to reflect these changes.

NRC Question:

2. CTS 3/4.7.D only applies to primary containment automatic isolation valves and primary system instrument line flow check valves. Change 4 in your December 21, 2001, submittal changes the title from “Primary Containment Automatic Isolation Valves” to “Primary Containment Isolation Valves (PCIVs)” and modifies CTS 3.7.D.2 and CTS 4.7.D.2. The title change and the changes made to CTS 3.7.D.2/PTS 3.7.D.2, CTS 4.7.D.2/PTS 4.7.D.2 and its associated Bases expands the scope of this LCO to include manual valves, normally closed deactivated automatic valves, blind flanges, and check valves that are used for containment isolation. No justification is provided for this aspect of the change. See Comment Numbers 3, 4, 5, 6, 7, and 11 for additional concerns in this area. **Comment:** Provide a discussion and justification for this change. See Comment Numbers 3, 4, 5, 6, 7, and 11.

NMC Response:

The purpose of this revision to the CTS was to provide a specification that would be applicable to all containment isolation valves. This was considered by Monticello to be a conservative change since the CTS provided no specification that was applicable to containment isolation valves other than the primary containment automatic isolation valves. This more restrictive PTS expands the Technical Specification requirements from the small population of Primary Containment Automatic Isolation valves to a larger population of all Primary Containment Isolation Valves (PCIVs). This change was considered an enhancement since the CTS did not provide specific requirements for PCIVs, other than the Automatic PCIVs. By expanding the scope to include all PCIVs it was also necessary to address methods of isolation and isolation devices that could be used to isolate a penetration flow path if inoperable valve(s) could not be returned to operable status. 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 valve, a closed manual valve, a blind flange, and a check valve with the flow through the valve secured. These isolation methods are being added to the PTS as an acceptable method of isolating primary containment penetrations. This is acceptable because these isolation methods provide for a positive means of assuring that the containment penetration path is isolated.

The function of the PCIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs) to within limits. Primary containment isolation within the time limits specified ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the DBA analysis.

PCIVs form a part of the primary containment boundary. The PCIV safety function is related to minimizing the loss of reactor coolant inventory and establishing the primary containment boundary during a DBA.

The normally closed PCIVs are considered operable when manual valves are closed or open in accordance with the appropriate administrative controls, automatic valves are de-activated and secured in their closed position, blind flanges are in place, and closed systems are intact.

This revised TS provides assurance that the PCIVs will perform their designed safety functions to minimize the loss of reactor coolant inventory and establish the primary containment boundary during accidents.

NRC Question:

3. CTS 3.7.D.2 requires that if an automatic PCIV becomes inoperable, "reactor operation in the run mode may continue provided at least one valve in each line having an inoperable valve is closed." No specific time limit is provided in CTS 3.7.D.2 to close this valve. However, based on CTS 4.7.D.2 it can be assumed the closure of the valve has to be accomplished within 24 hours, since closure needs to be recorded daily. In addition, the CTS does not require penetration isolation for an inoperable manual valve, inoperable normally closed deactivated automatic valves, inoperable blind flanges and inoperable check valves that are used for containment isolation. PTS 3.7.D.2.a specifies that flow paths with one PCIV inoperable, be isolated within specific times - 8 hours for MSIVs, 72 hours for excess flow check valves (EFCVs) and 4 hours for all others. No justifications are provided for these More Restrictive (24 hours and no time to 8 or 4 hours) and Less Restrictive (24 hours to 72 hours) changes. See Comment Number 10. **Comment:** Provide additional discussion and justification for these More Restrictive and Less Restrictive changes. See Comment Number 10.

NMC Response:

The purpose of this revision to the Monticello CTS was to provide a more definitive specification that provided time requirements to restore inoperable valves to operable status, or isolate inoperable primary containment isolation valves. The CTS does not provide this time limit and the SR of CTS 4.7.D.2 does not state that the penetration would have to be isolated within 24 hours, but only that once fully closed the position of the inoperable valve shall be recorded daily. The CTS 3.7.D.2 does not require penetration isolation for any valve other than Automatic PCIVs, but they would be required to be isolated to support CTS 3.7.A.2 (Primary Containment Integrity).

Additionally, Monticello concluded that inclusion of isolation times in this PTS was justified because these times have been approved at other facilities comparable to Monticello and are determined using the industry standards, operating experience, and best engineering judgment.

This more restrictive change, associated with the isolation completion time of 4 hours for PCIVs, is considered reasonable based on the time required to isolate the penetration and the relative importance of supporting primary containment operability during times when primary containment integrity is required. For MSIV leakage, an 8 hour completion time is allowed. The completion time of 8 hours, for MSIV leakage, is reasonable because it allows a period of time to restore the MSIVs to operable status given the fact that MSIV closure will result in isolation of the main steam line(s) and potential for plant shutdown.

For the less restrictive change associated with the excess flow check valves (EFCV) the proposed time to allow for restoration prior to requiring a shutdown is 72 hours. In this event, a limiting event will be within the bounds of the safety analysis. Allowing an extended restoration time, to potentially avoid a plant transient caused by a forced shutdown, is reasonable based on the low probability of an EFCV line break event, and does not represent a significant decrease in safety, given that the EFCVs contain area reductions that are approximately 1 inch in diameter.

NRC Question:

4. CTS 3.7.D.3 requires that a normal orderly shutdown to Cold Shutdown be completed within 24 hours if CTS 3.7.D.1 or 3.7.D.2 cannot be met. If two automatic PCIVs in a flow path become inoperable, CTS 3.7.D.3 must be entered. If two manual valves or two normally closed deactivated automatic valves are inoperable in a flow path, or any combination of automatic and non-automatic PCIVs are inoperable in a flow path, then CTS 3.7.A.2.a.(4) shall be entered. PTS 3.7.D.2.b proposes for two PCIVs inoperable in a flow path, that the flow path be isolated within 1 hour, in order to continue reactor operation. No justification is provided for this Less Restrictive (immediate shutdown to isolation within 1 hour and continued operation) and Administrative (CTS 3.7.A.2.a.(4) to PTS 3.7.D.2.b) changes. **Comment:** {Provide additional discussion and justification for these Less Restrictive and Administrative changes.

NMC Response:

The definition for Primary Containment Integrity is defined in CTS 1.0.P:

> Primary Containment Integrity means that the drywell and pressure suppression chamber are intact and all of the following conditions are satisfied.
>
> 1. All manual containment isolation valves on lines connecting to the reactor coolant system or containment which are not required to be open during accident conditions are closed.

2. At least one door in the airlock is closed and sealed.

3. All automatic containment isolation valves are operable or are deactivated in the closed position or at least one valve in each line having an inoperable valve is closed.

4. All blind flanges and manways are closed.

Therefore, if two manual valves, or two normally closed deactivated automatic valves are inoperable in a flow path, or any combination of automatic and non-automatic PCIVs are inoperable in a flow path there is no requirement to enter CTS 3.7.A.2.(4) if containment integrity, as defined above, can be demonstrated. PTS 3.7.D proposes to clarify this condition and provide more specific requirements for differing inoperable PCIVs. This less restrictive change is acceptable because the 1 hour completion time to isolate two inoperable PCIVs in a penetration flow path is consistent with the specification requirement of CTS 3.7.A.2.a.(4).

NRC Question:

5. CTS 3.7.D.2 requires that if an automatic PCIV becomes inoperable, "reactor operation in the run mode may continue provided at least one valve in each line having an inoperable valve is closed." The CTS does not specify how this requirement is to be met. PTS 3.7.D.2 clarifies this requirement by changing "...at least one valve...is closed": to "at least one valve...is deactivated in the isolated condition" and defines how this requirement can be satisfied. Two means of satisfying the requirement is with a "blind flange or check valve with the flow through the valve secured." The CTS based on the wording and structure of CTS 3.7.D.2 and 4.7.D.2 would not allow the use of a blind flange or check valve with flow through the valve secured to be used to isolate a penetration with an inoperable valve. No justification if provided for this Less Restrictive change. See Comment Number 6 for an additional concern in this area. **Comment:** Provide additional discussion and justification for this Less Restrictive change. See Comment Number 6.

NMC Response:

CTS 3.7.D.2 states that "... reactor operation in the run mode may continue provided at least one valve in each line having an inoperable valve is closed." This statement does not preclude the use of a blind flange or check valve with the flow through the valve secured, as long as "... at least one valve in each line having an inoperable valve is closed." Additionally, CTS 3.7.D is written for automatic PCIVs, while PTS 3.7.D is written for all PCIVs, so not only were the requirements of this TS expanded, but in doing so Monticello determined that the requirements for isolation of an inoperable PCIV also needed to be included to provide a clearer understanding of not only when to isolate a penetration with an inoperable valve, but also how this isolation can be achieved.

As stated above in response to NRC Question 4, the CTS 1.0.P provides the definition of Primary Containment Integrity, item 4 states that "All blind flanges and manways are closed." This CTS provides for the use of blind flanges to provide primary containment integrity and was reviewed and approved by the NRC as acceptable with the issuance of the Technical Specifications for the Monticello Nuclear Generating Plant.

This less restrictive change also includes the use of check valves with the flow through the valve secured as a method of isolating a penetration with one inoperable PCIV. Many penetrations are designed with check valves as acceptable isolation barriers. With forward flow in the line secured, a check valve is essentially equivalent to a closed manual valve. For those penetrations designed with check valves as acceptable isolation devices, this proposed change provides an equivalent level of safety. For penetrations not designed with check valves for isolation, the proposed change does not affect the requirements to isolate with a closed deactivated automatic valve or closed manual valve. The use of check valves as isolation devices is detailed in NMC's response to question 6 below.

Additionally, this less restrictive change provides a PTS that will list all of the acceptable isolation devices. Since the results of the specification continues to be an acceptable isolation of the penetration for continued operation, the proposed change does not adversely affect safe operation, and is consistent with Monticello current practice. These methods of isolating the primary containment have been reviewed and approved by the NRC at other plants comparable to Monticello and therefore are considered to be acceptable standard industry operating practices.

NRC Question:

6. CTS 3.7.D.2 requires that if an automatic PCIV becomes inoperable, "reactor operation in the run mode may continue provided at least one valve in each line having an inoperable valve is closed." The CTS does not specify how this requirement is to be met. PTS 3.7.D.2 clarifies this requirement by changing "at least one valve... is closed" to "at least one valve... is deactivated in the isolated condition" and defines how this requirement can be satisfied. One means of satisfying the requirement is with a "check valve with the flow through the valve secured." While this means of isolating a penetration is acceptable for penetrations or flow paths with two PCIVs in the flow path and one PCIV inoperable, it is unacceptable for flow paths with two PCIVs in the flow path and two PCIVs inoperable (PTS 3.7.D.2.b) and flow paths with one PCIV in the flow path whether in a closed or non-closed system and an inoperable PCIV (PTS 3.7.D.2.a). As stated in the Bases of STS 3.6.1.3 of NUREG 1433, a check valve may not be used to isolate penetrations for these two situations. **Comment:** Revise PTS 3.7.D.2 to reflect that check valves may not be used to isolate penetrations with two inoperable PCIVs and one inoperable PCIV in systems with one PCIV in the flow path.

NMC Response:

Monticello agrees with the assessment that a check valve cannot be used to isolate a penetration with two inoperable PCIVs or a penetration with only one PCIV. Therefore, PTS 3.7.D.2.a will be revised to state:

> "In the event one or more penetration flow paths with one PCIV inoperable, reactor operation in the run mode may continue provided that within the subsequent 4 hours (8 hours for MSIVs and 72 hours for EFCVs), restore the valve to operable status, or at least one valve in each line having an inoperable valve is deactivated in the isolated condition. This requirement may be satisfied by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with the flow through the check valve secured, except that a check valve cannot be used to isolate a penetration that has only one PCIV. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)*"

And PTS 3.7.D.2.b will be revised to state:

> "In the event one or more penetration flow paths with two PCIVs inoperable, reactor operation in the run mode may continue provided that within the subsequent 1 hour, restore the valves to operable status, or at least one valve in each line having inoperable valves is deactivated in the isolated condition. This requirement may be satisfied by use of at least one closed and deactivated automatic valve, closed manual valve, or blind flange. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)*"

These changes are acceptable because they provide clarification that check valves may not be used to isolate penetrations with two inoperable PCIVs and one inoperable PCIV in systems with only one PCIV in the flow path.

NRC Question:

7. CTS 4.7.D.2 is performed any time a valve is closed due to an inoperable automatic PCIV. PTS 4.7.D.2 modifies this surveillance to be applicable to any penetration or flow path with a PCIV in the isolated/closed position whether the valve was closed due to CTS 3.7.D.2/PTS 3.7.D.2 or the valve is closed due to its normal operating position. No justification is provided for this More Restrictive change. See Comment Number 8 for an additional concern in this area. **Comment:** Provide additional discussion and justification for this More Restrictive change. See Comment Number 8.

NMC Response:

It was not the intent of the PTS to expand this surveillance to be applicable to any penetration or flow path with a PCIV in the isolated/closed position whether the valve was closed due to CTS 3.7.D.2/PTS 3.7.D.2 or if the valve was closed because that is its normal operating position.

The intent of this administrative PTS change was to maintain this surveillance at the existing level of requirement that is currently present in the Monticello CTS.

Therefore, PTS 4.7.D.2 will be revised to state:

> "Whenever a containment penetration flow path is isolated, by a valve deactivated in the isolated position, to satisfy the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or the isolation devices outside primary containment shall be recorded monthly.** ..."

This will provide clarification that this Surveillance is only required when a valve is secured in its deactivated and isolated position or an isolation device is installed to meet the requirements of Primary Containment Isolation.

NRC Question:

8. PTS 3.7.D.2.a and 3.7.D.2.b are modified by an * note which allows isolated valves closed to satisfy these actions to be reopened on an intermittent basis under Operations Committee approved administrative controls. CTS 3.7.D.2 and CTS 4.7.D.2 do not allow for valve opening on any basis once the valve is closed. No justification is provided for this Less Restrictive change. In addition, PTS 4.7.D.2 specifies that any penetration or flow path with a PCIV in the isolated/closed position whether the valve was closed due to PTS 3.7.D.2 or the valve is closed due to its normal operating position be verified closed at specific frequencies. If a normally closed PCIV is opened for any reason, this could be considered as the valve being inoperable, i.e., not able to perform its safety function. Under these circumstances, entry into PTS 3.7.D.2 would be required. In order to avoid unnecessary entry in PTS 3.7.D.2, the proposed * note should also apply to PTS 4.7.D.2. **Comment:** Provide additional discussion and justification for this Less Restrictive change and revise PTS 4.7.D.2 to include the * note.

NMC Response:

For this less restrictive change the specifications and surveillance are modified by a footnote (*) that will allow penetration flow path(s) isolated to meet the requirements of PTS 3.7.D.2.a, 3.7.D.2.b, and 4.7.D.2 to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated. Opening of primary containment penetrations on an intermittent basis under administrative controls is acceptable because it is required for performing surveillances, repairs, routine evolutions, etc.

Additionally, this less restrictive change allows the (*) footnote to be added to PTS 4.7.D.2 and both footnotes will be revised to state:

> "Isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under approved administrative controls."

This revision supports changes to the Monticello TS that were implemented by Operating License amendment number 124, which relocated Operations Committee review of procedures from the Monticello TS to the Xcel Energy Operational Quality Assurance Plan.

Additionally, PTS 4.7.D.2 will be revised to state:

> "...For a containment penetration flow path isolated, by a valve deactivated in the isolated position, to meet the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or isolation devices inside primary containment which have not had their position recorded in the previous 92 days, shall have their position recorded ..."

Which in combination with the revision in response to question 7 above will provide clarification that this Surveillance will only apply to those valves that have been isolated and isolation devices which have been installed in accordance with the requirements of PTS LCO 3.7.D.2.

Additionally, TS Bases page 182 will be revised to state:

> "The Technical Specifications are modified by a footnote allowing penetration flow path(s) to be unisolated intermittently under approved administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve who is in constant communication with the control room. In this way, the penetration can be rapidly isolated when a need for the primary containment is indicated."

The footnote is acceptable because it allows for scheduling and performing required testing and maintenance even with an inoperable PCIV. This change is acceptable because unisolating these valves is typically for short durations and the probability of an accident occurring during the period when the valve is open is minimal.

NRC Question:

9. Change 5 in your submittal of December 21, 2001 relocates CTS 3.7.A.5.c to PTS 3.7.D.3, and rewords the specification to clarify the requirements. While this overall change is acceptable, one aspect of the change has not been justified. The implication of CTS 3.7.A.5.c/PTS 3.7.D.3 is that other than for inerting and de-inerting operations and all other purging and venting operations, the 18 inch purge and vent valves and 2 inch purge and vent valves respectively shall be closed. PTS 4.7.D.2 requires that valves/isolation devices in the closed/isolation position shall be verified on a monthly frequency for valves/isolation devices located outside containment and verified prior to entering Startup or Hot Shutdown from Cold Shutdown, if primary containment was de-inerted while in Cold Shutdown and not verified within the previous 92 days. Thus the 18 inch and 2 inch purge and vent valves would be required to be verified closed on the frequencies specified in PTS 4.7.D.2 unless opened in accordance with PTS 3.7.D.3. NUREG 1433 STS SR 3.6.1.3.2 is the corresponding STS SR for these valves. The frequency specified in the STS for verifying closure of the valves is every 31 days regardless of whether the valve is located inside or outside containment, unless they are open for specific reasons. No justification is provided for deviating from the STS frequency of 31 days for those purge and vent valves inside containment. **Comment:** Provide a discussion and justification for this deviation from the STS frequency.

NMC Response:

As stated in the Monticello submittal dated December 21, 2001 the intent of this administrative change was to provide clarification for the use of the 18-inch purge and vent valves and eliminate confusion on the part of operations personnel. When primary containment integrity is required the 18-inch purge and vent valves may only be used as specified in TS 3.7.A.5.b, all other purging and venting operations shall be via the 2-inch purge and vent bypass lines through the Standby Gas Treatment System.

As clarified by this submittal, in response to questions 7 and 8, PTS 3.7/4.7.D pertains to penetration flow paths with inoperable PCIV(s), and how these inoperable valves are verified to be in their isolated position. It was not the intent of this PTS submittal to require that the 18-inch vent and purge valves be verified, once per 31 days, to be in the closed position during the run mode of operation. However, as stated in NMC's response to the NRCs request for additional information, question #10, a revision to this proposed change is being requested to allow isolation of purge and vent valves which do not meet their leakage limits. Any purge and vent valve isolated because it does not meet its leakage limits will be verified to be in the isolated position as required by this proposed revision to PTS.

This PTS administrative change provides additional clarification for the use of the 18-inch purge and vent valves, while maintaining the equivalent level of requirements that currently exist in the Monticello TS.

NRC Question:

10. Change 5 in your submittal of December 21, 2001, relocates CTS 3.7.A.5.c to PTS 3.7.D.3 and rewords the specification to clarify the requirements. While this overall change is acceptable, one aspect of the change may not have been fully considered. If the purge and vent valves are opened for any reason other than inerting and de-inerting operations or purging or venting, CTS 3.7.A.5.c/PTS 3.7.D.3 is violated and the actions of CTS 3.7.A.6 /PTS 3.7.D.4 are entered which requires that Cold Shutdown be reached within 24 hours. Under the same conditions, NUREG 1433, STS 3.6.1.3 would require entry into actions similar to PTS 3.7.D.2 before initiating a shutdown. Since the licensee already has to justify the changed Completion Times for PTS 3.7.D.2 per Comment Number 3, including this change into the proposal should not cause an undue burden and would be advantageous to the licensee. **Comment:** :Licensee should consider modifying the proposal to take advantage of this Less Restrictive change, and provide the appropriate discussions and justifications.

NMC Response:

After careful consideration and review of the above question and comment, NMC has decided that it would be advantageous to modify the requirements of PTS 3.7.D.3. The revised PTS 3.7.D.3.a will remain worded the same as the proposed 3.7.D.3 that was submitted by the Monticello Nuclear Generating Plant by letter dated December 21, 2001. The additional inclusion of PTS 3.7.D.3.b will state that:

> "In the event one or more penetration flow paths with one or more containment purge and vent valves not within purge and vent valve leakage limits, reactor operation in the run mode may continue provided that within the subsequent 24 hours, restore the valve(s) to operable status, or at least one valve in each line having a purge and vent valve not within leakage limits is deactivated in the isolated position. This requirement may be satisfied by use of one closed and deactivated automatic valve, closed manual valve, or blind flange. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)"

Additionally, a new TS 4.7.D.3 will be added to state:

"Whenever containment purge and vent valves are isolated to meet the requirements of TS 3.7.D.3.b, the position of the deactivated and isolated valves or isolation devices outside primary containment shall be recorded monthly.**

The footnote will state:

"** Isolated valves or devices in high radiation areas may be verified by use of administrative means."

Additionally, the footnote allowing intermittent operation will not be applicable to the 18-inch purge and vent valves. The current PTS 4.7.D.3 will be renumbered as 4.7.D.4, for administrative purposes.

This change is provided as a clarification to the previously proposed change and is justified because this required surveillance does not require any testing or device manipulation. Rather, it involves verification that those isolation devices outside primary containment and capable of being mispositioned, are in the correct position. Additionally, this surveillance requirement is modified by a footnote that applies to isolation devices located in high radiation areas, and allows them to be verified by use of administrative means. The 24-hour time period is justified because it is based on engineering judgment and is considered reasonable in view of the inaccessability of the devices and other administrative controls ensuring that device misalignment is an unlikely possibility.

NRC Question:

11. As stated in Comment Number 2 above, the changes made to CTS 3/4.7.D and its associated Bases have expanded the scope of this specification. However, the changes made in PTS 4.7.D.2 are confusing and seem to contradict the intent of the overall proposed change. PTS 4.7.D.2 is composed of two parts - the surveillance for PCIVs outside containment and the surveillance for PCIVs inside containment. For the portion of the surveillance which deals with PCIVs outside containment, the wording limits the surveillance to valves "deactivated in the isolated position" which by definition in PTS 3.7.D.2 would mean it would only be applicable to closed deactivated automatic valves and closed secured manual valves. Non-secured manual valves and check valves whether open or closed and blind flanges outside containment would not be covered by this portion of the surveillance. On the other hand, all PCIVs whether opened or closed; secured or not secured; or active or deactivated and blind flanges inside containment would have to have their position verified on the specified frequency. The words "isolation devises" in this portion is all inclusive. **Comment:** Correct this discrepancy. See Comment Number 2.

NMC Response:

The proposed revisions to PTS 4.7.D.2 as stated in response to questions 7 and 8 above will clarify this PTS change. PTS 4.7.D.2, will be reworded to state the following:

> "Whenever a containment penetration flow path is isolated, by a valve deactivated in the isolated position, to meet the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or the isolation device outside primary containment shall be recorded monthly.** For a containment penetration flow path isolated, by a valve deactivated in the isolated position, to meet the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or isolation devices inside primary containment which have not had their position recorded in the previous 92 days, shall have their position recorded prior to entering Startup or Hot Shutdown from Cold Shutdown, if the primary containment was de-inerted while in Cold Shutdown.* "

* Isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under approved administrative controls.

** Isolated valves or devices in high radiation areas may be verified by use of administrative means.

These changes are acceptable because they provide for a consistent level of verifying that the valves deactivated and isolated to meet the TS LCO requirements are maintained in there required post accident position. Additionally, the results of this revised TS continues to be an acceptably isolated penetration for continued operation, and the proposed change does not adversely affect the safe operation of the plant.

SUMMARY

The following changes have been made to the material enclosed in our December 21, 2001 submittal:

A new wording change to the Current TS (CTS) 3.7.A.5.b is being proposed. The wording is being revised to maintain containment atmosphere oxygen concentration to less than 4% by volume within the 24-hour period after Thermal Power is > 15% Rated Thermal Power following startup, until 24 hours prior to reducing Thermal Power to < 15% Rated Thermal Power prior to the next scheduled reactor shutdown. Additionally, a wording change to Proposed TS (PTS) 3.7.A.5.d is being proposed to state that if the requirements of 3.7.A.5 cannot be met, reduce Thermal Power to ≤ 15% Rated Thermal Power, within 8 hours. This proposed CTS change and proposed PTS change and the reasons for change have been added accordingly.

An additional wording revisions to PTS 3.7.D.2.a and b are being proposed to delete the use of a check valve with flow through the valve secured as a means of isolating a penetration flow path with one PCIV inoperable on penetrations that contain only one PCIV and also delete the use of a check valve with flow through the check valve secured as a means of isolating a penetration with two PCIVs inoperable. Additionally, the footnote associated with these TS has been revised to delete the words Operations Committee. The PTS change and reason for change have been revised accordingly.

Additional changes are being proposed for PTS 4.7.D.2. The proposed change is being revised to state, in part, that if a containment penetration flow path is isolated, by a valve deactivated in the isolated position, to meet the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or isolation devices inside primary containment which have not had their position recorded in the previous 92 days, shall have their position recorded prior to entering Startup or Hot Shutdown from the Cold Shutdown, if the primary containment was de-inerted while in Cold Shutdown.* In addition to these wording changes, a footnote is being added to this SR to state that isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under approved administrative controls. The PTS change and reason for change have been revised accordingly.

Additional changes are also being proposed for PTS 3.7/4.7.D.3. The proposed changes add a new TS LCO as 3.7.D.3.b, which allows a containment purge and vent valve to be isolated if there is excessive leakage and a new TS SR, 4.7.D.3 is being added to record the position of any isolated purge and vent valves or isolation devices. The PTS change and reason for change have been revised accordingly.

The Bases for PTS 3.7 have been editorially revised.

These changes provide additional wording clarifications to the Monticello TS change request submitted by letter dated December 21, 2001, and as such, the Determination of No Significant Hazards Consideration and Environmental Assessment submitted by the original letter dated December 21, 2001, are also applicable to this supplemental submittal.

Exhibit B

License Amendment Request for
Containment Systems Technical Specification Changes

Current Monticello Technical Specification Pages Marked Up
With Proposed Change

This exhibit consists of current Technical Specification pages marked up with the proposed change. These pages replace the marked up pages submitted by letter dated December 21, 2001 in their entirety. Bold text includes original requested TS text changes and the additional changes to the marked up pages for this submittal are bold text in brackets.

The pages included in this exhibit are as listed below:

<u>Pages</u>

157
163
165
166
170
171
171a
177
180
182
182a
189
190

d. During reactor isolation conditions the reactor pressure vessel shall be depressurized to <200 psig at normal cooldown rates if the suppression pool temperature exceed 120°F.

e. The suppression ~~chamber~~ **pool** water level shall be > -4.0 and < +3.0 inches.

⇑

INSERT

With suppression pool water level not within limits, restore water level to within limits within the succeeding 2 hours.

~~f. Two channels of torus water level instrumentation shall be operable. From and after the date that one channel is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 30 days unless such channel is sooner made operable. If both channels are made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding six hours unless at least one channel is sooner made operable.~~

INSERT

f. If the requirements of 3.7.A.1 cannot be met, the reactor shall be placed in a Cold Shutdown condition within 24 hours, and suspend all activities with the potential for draining the reactor vessel.

d. Whenever there is indication of relief valve operation with a suppression pool temperature of > 160°F and the primary coolant system pressure >200 psig, an extended visual examination of the suppression chamber shall be conducted before resuming power operation.

e. The suppression ~~chamber~~ **pool** water level shall be checked once per day.

~~f. The suppression chamber water level indicators shall be calibrated semiannually.~~

3. Pressure Suppression Chamber - Reactor Building Vacuum Breakers

a. Except as specified in 3.7.A.3.b below, two pressure suppression chamber-reactor building vacuum breakers shall be operable at all times when the primary containment integrity is required. The set point of the differential pressure instrumentation which actuates the pressure suppression chamber-reactor building vacuum breakers shall be 0.5 psi.

b. From and after the date that one of the pressure suppression chamber-reactor building vacuum breakers is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such vacuum breaker is sooner made operable, provided that the repair procedure does not violate primary containment integrity.

INSERT

c. If the requirements of 3.7.A.3 cannot be met, the reactor shall be placed in a Cold Shutdown condition within 24 hours.

3. Pressure Suppression Chamber - Reactor Building Vacuum Breakers

a. The pressure suppression chamber-reactor building vacuum breakers and associated instrumentation including set point shall be checked for proper operation every three months.

e. One position alarm circuit can be inoperable providing that the redundant position alarm circuit is operable. Both position alarm circuits may be inoperable for a period not to exceed seven days provided that all vacuum breakers are operable.

INSERT

f.	If the requirements of 3.7.A.4 cannot be met, the reactor shall be placed in a Cold Shutdown condition within 24 hours.

b. When the position of any drywell-suppression chamber vacuum breaker valve is indicated to be not fully closed at a time when such closure is required, the drywell to suppression chamber differential pressure decay shall be demonstrated to be less than that shown on Figure 3.7.1 immediately and following any evidence of subsequent operation of the inoperable valve until the inoperable valve is restored to a normal condition.

c. When both position alarm circuits are made or found to be inoperable, the control panel indicator light status shall be recorded daily to detect changes in the vacuum breaker position.

5. **Primary** Containment ~~Atmosphere Control~~ **Oxygen Concentration**

a. The primary containment atmosphere shall be reduced to less than 4% oxygen by volume with nitrogen gas whenever the reactor is in the run mode, except as specified in 3.7.A.5.b.

b. Within the 24-hour period ~~subsequent to~~ **[after Thermal Power is > 15% Rated Thermal Power following startup, to 24** ~~placing the reactor in the run mode following~~ **hours prior to reducing Thermal Power to < 15% Rated Thermal Power prior to the next scheduled reactor]** shutdown, the containment atmosphere oxygen concentration shall be reduced to less than 4% by volume, and maintained in this condition. ~~Deinerting may commence 24 hours prior to leaving the run mode for a reactor shutdown.~~

5. **Primary** Containment ~~Atmosphere Control~~ **Oxygen Concentration**

Whenever inerting is required, the primary containment oxygen concentration shall be measured and recorded on a weekly basis.

Relocate To TS 3.7.D.3 And Reword

c. Except for inerting and deinerting operations permitted in (b) above, all containment purging and venting above cold shutdown shall be via a 2-inch purge and vent valve bypass line and the Standby Gas Treatment System. Inerting and deinerting operations may be via the 18-inch purge and vent valves (equipped with 40-degree limit stops) aligned to the Reactor Building plenum and vent.

INSERT ⇐

c. Whenever primary containment oxygen concentration is equal to or exceeds 4% by volume, except as permitted by 3.7.A.5.b above, within the subsequent 24 hour period return the oxygen concentration to less than 4% by volume.

~~6~~. d. If the requirements of 3.7.A.**5** cannot be met, ~~the~~ **[reduce Thermal Power to ≤ 15% Rated Thermal Power, within 8 hours.]** ~~reactor shall be placed in a **Hot S**hutdown condition within **12** hours.~~

B. Standby Gas Treatment System

1. Two separate and independent standby gas treatment system circuits shall be operable at all times when secondary containment integrity is required, except as specified in sections 3.7.B.1.(a) and (b).

   a. After one of the standby gas treatment system circuits is made or found to be inoperable for any reason, reactor operation and fuel handling is permissible only during the succeeding seven days, provided that all active components in the other standby gas treatment system are operable. Within 36 hours following the 7 days, the reactor shall be placed in a condition for which the standby gas treatment system is not required in accordance with Specification 3.7.C.2.(a) through (d).

B. Standby Gas Treatment System

1. Once per month, operate each train of the standby gas treatment system for ≥ 10 continuous hours with the inline heaters operating.

reactor core, operations with a potential for reducing the shutdown margin below that specified in specification 3.3.A, and handling of irradiated fuel or the fuel cask in the secondary containment are to be immediately suspended if secondary containment integrity is not maintained.

D. Primary Containment ~~Automatic~~ Isolation Valves **(PCIVs)**

1. During reactor power operating conditions, all Primary Containment automatic isolation valves and all primary system instrument line flow check valves shall be operable except as specified in 3.7.D.2.

D. Primary Containment ~~Automatic~~ Isolation Valves **(PCIVs)**

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

    a. At least once per operating cycle the operable isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and closure times.

    b. At least once per operating cycle the primary system instrument line flow check valves shall be tested for proper operation.

    c. All normally open power-operated isolation valves shall be tested in accordance with the Inservice Testing Program. Main Steam isolation valves shall be tested (one at a time) with the reactor power less than 75% of rated.

3.0 LIMITING CONDITIONS FOR OPERATION	4.0 SURVEILLANCE REQUIREMENTS

2. ~~In the event any Primary Containment automatic isolation valve becomes inoperable, reactor operation in the run mode may continue provided at least one valve in each line having an inoperable valve is closed.~~

3. ~~If Specification 3.7.D.1 and 3.7.D.2 cannot be met, initiate normal orderly shutdown and have reactor in the cold shutdown condition within 24 hours.~~

d. At least once per week the main steam-line power-operated isolation valves shall be exercised by partial closure and subsequent reopening.

2. ~~Whenever a Primary Containment automatic isolation valve is inoperable, the position of at least one fully closed valve in each line having an inoperable valve shall be recorded daily.~~

3. ~~Deleted~~

4. ~~The seat seals of the drywell and suppression chamber 18-inch purge and vent valves shall be replaced at least once every six operating cycles. If periodic Type C leakage testing of the valves performed per surveillance requirement 4.7.A.2.b identifies a common mode test failure attributable to seat seal degradation, then the seat seals of all drywell and suppression chamber 18-inch purge and vent valves shall be replaced.~~

INSERT ATTACHED

Rewrite for TS Page 171

2. a. In the event one or more penetration flow paths with one PCIV inoperable, reactor operation in the run mode may continue provided that within the subsequent 4 hours (8 hours for MSIVs and 72 hours for EFCVs)**[restore the valve to operable status, or]** at least one valve in each line having an inoperable valve is deactivated in the isolated condition. This requirement may be satisfied by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured**[, except that a check valve cannot be used to isolate a penetration that has only one PCIV]**. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)*

   b. In the event one or more penetration flow paths with two PCIVs inoperable, reactor operation in the run mode may continue provided that within the subsequent 1 hour **[restore the valves to operable status, or]** at least one valve in each line having inoperable valves is deactivated in the isolated condition. This requirement may be satisfied by use of at least one closed and deactivated automatic valve, closed manual valve, or blind flange **[ ]**. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)*

* Isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under **[**~~Operations Committee~~**]** approved administrative controls.

2. Whenever a **[containment]** penetration flow path is isolated by a valve deactivated in the isolated position, **[to meet the requirements of Specification 3.7.D.2, the]** position of the deactivated and isolated valves **[or the isolation device]** outside primary containment shall be recorded monthly. ** For ~~isolation devices~~ **[a containment penetration flow path isolated by a valve deactivated in the isolated position, to meet the requirements of Specification 3.7.D.2, the position of the deactivated and isolated valves or isolation devices]** inside primary containment which have not **[had their position]** ~~been~~ recorded in the previous 92 days, **[shall have]** their position ~~shall be~~ recorded prior to entering Startup or Hot Shutdown from Cold Shutdown, if the primary containment was de-inerted while in Cold Shutdown.**[*]**

[* Isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under approved administrative controls.]

** Isolation devices in high radiation areas may be verified by use of administrative means.

3.0 LIMITING CONDITIONS FOR OPERATION

3. a. The inerting and deinerting operations permitted by TS 3.7.A.5.b shall be via the 18-inch purge and vent valves (equipped with 40-degree limit stops) aligned to the Reactor Building plenum and vent. All other purging and venting, when primary containment integrity is required, shall be via the 2-inch purge and vent bypass line and the Standby Gas Treatment System.

   [b. In the event one or more penetration flow paths with one or more containment purge and vent valves not within purge and vent valve leakage limits, reactor operation in the run mode may continue provided that within the subsequent 24 hours, restore the valve(s) to within leakage limits, or at least one valve in each line having a purge and vent valve not within leakage limits is deactivated in the isolated position. This requirement may be satisfied by use of one closed and deactivated automatic valve, closed manual valve, or blind flange. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)]

4. If Specification 3.7.D.1, 3.7.D.2 and 3.7.D.3 cannot be met initiate normal orderly shutdown and have the reactor in the Cold Shutdown condition within 24 hours.

4.0 SURVEILLANCE REQUIREMENTS

[3. Whenever containment purge and vent valves are isolated to meet the requirements of TS 3.7.D.3.b, the position of the deactivated and isolated valves outside primary containment shall be recorded monthly.]**

4. The seat seals of the drywell and suppression chamber 18-inch purge and vent valves shall be replaced at least once every 6 operating cycles. If periodic Type C leakage testing performed per surveillance requirement 4.7.A.2.b identifies a common mode failure attributable to seat seal degradation, then all drywell and suppression chamber 18-inch purge and vent valves seat seals shall be replaced.

[Isolated valves in high radiation areas may be verified by use of administrative means.]**

Bases 3.7 (Continued) :

If a loss of coolant accident were to occur when the reactor water temperature is below 330°F, the containment pressure will not exceed the 62 psig design pressure, even if no condensation were to occur. The maximum allowable pool temperature, whenever the reactor is above 212°F, shall be governed by this specification. Thus, specifying water volume-temperature requirements applicable for reactor water temperatures above 212°F provides additional margin above that available at 330°F.

The large amount of water that must be added or removed to cause a significant change in the suppression chamber water inventory is not likely to go un-noticed. With a daily check of water level, there is an extremely low probability that a loss of coolant accident will occur simultaneously with water level being outside of the specified range. ~~Two indicators provide redundant readings for comparison (with no automatic action initiation). The provisions allowing one or both indicators out of service are consistent with the need for a redundant indicator and the frequency for checking the level, respectively.~~

INSERT

Therefore, allowing up to 2 hours to restore level, should be acceptable for a limited time. The 2 hour completion time is sufficient to restore suppression pool water level to within limits.

~~In conjunction with the Mark I Containment Short Term Program, a plant unique analysis was performed which demonstrated a factor of safety of at least two for the weakest element in the suppression chamber support system and attached piping.~~

Bases 3.7 (Continued) :

vacuum breaker selector switch, and a common test switch. The reactor building vacuum breaker panel contains one red light and one green light for each of the eight valves. There are four independent limit switches on each valve. The two switches controlling the red lights are adjusted to provide an indication of disc opening of less than 1/8" at the bottom of the disc. These switches are also used to activate the valve position alarm circuits. The two switches controlling the green lights are adjusted to provide indication of the disc very near the full open position.

The control room alarm circuits are redundant and fail safe. This assures that no simple failure will defeat alarming to the control room when a valve is open beyond allowable and when power to the switches fails. The alarm is needed to alert the operator that action must be taken to correct a malfunction or to investigate possible changes in valve position status, or both. If the alarm cannot be cleared due to the inability to establish indication of closure of one or more valves, additional testing is required. The alarm system allows the operator to make this evaluation on a timely basis. The frequency of the testing of the alarms is the same as that required for the position indication system.

Operability of a vacuum breaker valve and the four associated indicating light circuits shall be established by cycling the valve. The sequence of the indicating lights will be observed to be that previously described. If both green light circuits are inoperable, the valve shall be considered inoperable and a pressure test is required immediately and upon indication of subsequent operation. If both red light circuits are inoperable, the valve shall be considered inoperable, however, no pressure test is required if positive closure indication is present.

Oxygen concentration is limited to 4% by volume to minimize the possibility of hydrogen combustion following a loss of coolant accident. Significant quantities of hydrogen could be generated if the core cooling systems failed to sufficiently cool the core. The occurrence of primary system leakage following a major refueling outage or other scheduled shutdown is more probable than the occurrence of the loss of coolant accident upon which the specified oxygen concentration limit is based. Permitting access to the drywell for leak inspections during a startup is judged prudent in terms of the added plant safety offered without significantly reducing the margin of safety. Thus, to preclude the possibility of starting the reactor and operating for extended periods of time with significant leaks in the primary system, leak inspections are scheduled during startup periods, when the primary system is at or near rated operating temperature and pressure. The 24-hour period to provide inerting **after Reactor Thermal Power is greater than 15% Rated Thermal Power,** is judged to be sufficient to perform the leak inspection and establish the required oxygen concentration. **If the containment atmosphere exceeds the oxygen concentration of ≥ 4% by volume, then the oxygen concentration must be restored to < 4% by volume within the subsequent 24 hour period. The 24 hour period is allowed when oxygen concentration is ≥ 4% by volume because of the low probability and long duration of an event that would generate significant amounts of hydrogen occurring during this period.** The primary containment is normally slightly pressurized during periods of reactor operation. Nitrogen used for inerting could leak

Bases 3.7 (Continued) :

out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, no monitoring of oxygen concentration is necessary. However, at least once a week the oxygen concentration will be determined as added assurance.

B. Standby Gas Treatment System and C. Secondary Containment

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

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the chimney during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. One standby gas treatment system circuit is designed to automatically start upon containment isolation and to maintain the reactor building pressure at the design negative pressure so that all leakage should be in-leakage. Should one circuit fail to start, the redundant alternate standby gas treatment circuit is designed to start automatically. Each of the two circuits has 100% capacity. Only one of the two standby gas treatment system circuits is needed to cleanup the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is no immediate threat to the containment system performance. Therefore, reactor operation or refueling operation may continue while repairs are being made. If neither circuit is operable, the plant is placed in a condition that does not require a standby gas treatment system.

While only a small amount of particulates are released from the primary containment as a result of the loss of coolant accident, high-efficiency particulate filters before and after the charcoal filters are specified to minimize potential particulate release to the environment and to prevent clogging of the charcoal adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The in-place test results should indicate a system leak tightness of less than 1% bypass leakage for the charcoal adsorbers using halogenated hydrocarbon and a HEPA filter efficiency of at least 99% removal of DOP particulates. Laboratory carbon sample test results indicate a radioactive methyl iodide removal efficiency for expected accident conditions. The allowable penetration for the laboratory test is based on the 90% adsorber efficiency assumed in the off-site dose analysis and a safety factor of ≥ 2. Operation of the standby gas treatment circuits significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers. If the performance requirements are met as specified, the calculated doses would be less than the guidelines stated in 10 CFR 100 for the accidents analyzed.

D. Primary Containment Isolation Valves

The function of the Primary Containment Isolation Valves (PCIVs), in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents to within limits. The PCIVs help ensure that an adequate primary containment boundary is maintained during and after an accident by minimizing potential paths to the environment. Therefore, Technical Specifications requirements provide assurance that primary containment function assumed in the safety analysis will be maintained. These valves are either passive or active (automatic). Manual valves, deactivated automatic valves (including remote manual valves) secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices.

~~Double isolation valves are provided on lines penetrating the primary containment.~~ Closure of one of the valves in each line would be sufficient to maintain the integrity of the Primary Containment. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss-of-coolant accident. Details of the Primary Containment isolation valves are discussed in Section 5.2 of the USAR. A listing of all Primary Containment automatic isolation valves including maximum operating time is given in USAR Table 5.2-3b.

The Technical Specifications are modified by a footnote allowing penetration flow path(s) to be unisolated intermittently under approved administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve who is in constant communication with the control room. In this way, the penetration can be rapidly isolated when a need for the primary containment isolation is indicated.

With one or more penetration flow paths with one PCIV inoperable, the affected penetration must be returned to operable status or isolated within 4 hours (8 hours for MSIVs and 72 hours for EFCVs). The 4 hour completion time is reasonable considering the time required to isolate the penetration and the relative importance of supporting primary containment. The 8 hour completion time for MSIVs allows a period of time to restore the MSIVs to operable status given the fact that MSIV closure will result in a potential for plant shutdown. The 72 hour completion time for EFCVs is reasonable considering the instrument and the small diameter of the penetration piping combined with the ability of the penetration to act as an isolation boundary. With one or more penetrations with two PCIVs inoperable, either the inoperable PCIVs must be returned to operable status or the affected penetration flow path must be isolated within 1 hour.

Specification 3.7.D.3 requires the containment to be purged and vented through the standby gas treatment system except during inerting and deinerting operations. This provides for iodine and particulate removal from the containment atmosphere. Use of the 2-inch flow path prevents damage to the standby gas treatment system in the event of a loss of coolant accident during purging or venting. Use of the reactor building plenum and vent flow path for inerting and deinerting operations permits the control room operators to monitor the activity level of the resulting effluent by use of the Reactor Building Vent Wide Range Gas Monitors.

E. Combustible Gas Control System

The function of the Combustible Gas Control System (CGCS) is to maintain oxygen concentrations in the post-accident containment atmosphere below combustible concentrations. Oxygen may be generated in the hours following a loss of coolant accident from radiolysis of reactor coolant.

The Technical Specifications limit oxygen concentrations during operation to less than four percent by volume during operation. The maintenance of an inert atmosphere during operation precludes the build-up of a combustible mixture due to a fuel metal-water reaction. The other potential mechanism for generation of combustible mixtures is radiolysis of coolant which has been found to be small.

A special report is required to be submitted to the Commission to outline CGCS equipment failures and corrective actions to be taken if inoperability of one train exceeds thirty days. In addition, if both trains are inoperable for more than 30 days, the plant is required to shutdown until repairs can be made.

Bases 4.7 (Continued) :

D. Primary Containment Isolation Valves

Those large pipes comprising a portion of the reactor coolant system whose failure could result in uncovering the reactor core are supplied with automatic isolation valves (except those lines needed for emergency core cooling system operation or containment cooling). The closure times specified in USAR Table 5.2-3b are adequate to prevent loss of more coolant from the circumferential rupture of any of these lines outside the containment than from a steam line rupture. Therefore, this isolation valve closure time is sufficient to prevent uncovering the core.

The primary containment isolation valves are highly reliable, have low service requirement, and most are normally closed. The initiating sensor and associated trip channels are also checked to demonstrate the capability for automatic isolation. Reference Section 5.2.2.5.3 and Table 5-2-3b USAR. The test interval of once per operating cycle for automatic initiation results in a failure probability of 1.1×10^{-7} that a line will not isolate. More frequent testing for valve operability results in a more reliable system.

Normally closed PCIVs are considered operable when :

Manual valves are closed, or opened in accordance with appropriate administrative controls, or

Automatic valves or remote manual valves are capable of performing their intended safety function, or

Automatic valves or remote manual valves are de-activated and secured in their closed position and this condition has been included in their design basis, or

Blind flanges are in place, or

Closed systems are intact.

With one or more penetration flow paths with one or more PCIVs inoperable, restore the valve(s) to operable status or the affected penetration flow paths 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 criterion are a closed and de-activated automatic valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured, [except that a check valve with flow through the valve secured, cannot be used to isolate a penetration with

only one PCIV or a penetration with two inoperable PCIVs]. For an isolated penetration the device used to isolate the penetration should be the closest available valve to the primary containment. Affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that primary containment penetrations required to be isolated following an accident, and no longer capable of being automatically isolated, will be in the isolation position should an event occur. This required action does not require any testing or device manipulation. Rather, it involves verification that those devices outside containment and capable of potentially being mispositioned are in the correct position. The completion time of "monthly" for devices outside containment is appropriate because the devices are operated under administrative controls and the probability of their misalignment is low. For the devices inside primary containment, the time period specified "prior to entering Startup or Hot Shutdown from Cold Shutdown, if primary containment was deinerted while in Cold Shutdown, if not performed in the previous 92 days" is based on engineering judgement and is considered reasonable in view of the inaccessibility of the devices and other administrative controls ensuring that device misalignment is an unlikely possibility.

The surveillance requirements are modified by a footnote allowing both active and passive isolation devices, used to isolate a penetration, that are located in high radiation areas can be verified by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of these devices, once they have been verified in the proper position, is low.

The containment is penetrated by a large number of small diameter instrument lines. A program for the periodic testing (see Specification 4.7.D) and examination of the valves in these lines has been developed and a report covering this program was submitted to the AEC on July 27, 1973.

The main steam line isolation valves are functionally tested on a more frequent interval to establish a high degree of reliability.

E. Combustible Gas Control System

The Combustible Gas Control System (CGCS) is functionally tested once every six months to ensure that the recombiner trains will be available if required. In addition, calibration and maintenance of essential components is specified once each operating cycle.

Exhibit C

License Amendment Request for
Containment Systems Technical Specification Changes

Revised Monticello Technical Specification Pages

This exhibit consists of revised Technical Specification pages that incorporate the proposed change. These pages replace the previously submitted pages included as Exhibit C to the NMC letter dated December 21, 2001 in their entirety.

The pages included in this exhibit are as listed below:

<u>Pages</u>

157
163
165
166
170
171
171a
177
180
181
182
182a
189
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3.0 LIMITING CONDITIONS FOR OPERATION

d. During reactor isolation conditions the reactor pressure vessel shall be depressurized to <200 psig at normal cooldown rates if the suppression pool temperature exceed 120°F.

e. The suppression pool water level shall be $\geq$ -4.0 and $\leq$+3.0 inches. With suppression pool water level not within limits, restore water level to within limits within the succeeding 2 hours.

f. If the requirements of 3.7.A.1 cannot be met, the reactor shall be placed in a Cold Shutdown condition within 24 hours, and suspend all activities with the potential for draining the reactor vessel.

4.0 SURVEILLANCE REQUIREMENTS

d. Whenever there is indication of relief valve operation with a suppression pool temperature of $\geq$160°F and the primary coolant system pressure $>$200 psig, an extended visual examination of the suppression chamber shall be conducted before resuming power operation.

e. The suppression pool water level shall be checked once per day.

3.0 LIMITING CONDITIONS FOR OPERATION

3. Pressure Suppression Chamber - Reactor Building Vacuum Breakers

   a. Except as specified in 3.7.A.3.b below, two pressure suppression chamber-reactor building vacuum breakers shall be operable at all times when the primary containment integrity is required. The set point of the differential pressure instrumentation which actuates the pressure suppression chamber-reactor building vacuum breakers shall be 0.5 psi.

   b. From and after the date that one of the pressure suppression chamber-reactor building vacuum breakers is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such vacuum breaker is sooner made operable, provided that the repair procedure does not violate primary containment integrity.

   c. If requirements of 3.7.A.3 cannot be met, the reactor shall be placed in a Cold Shutdown condition within 24 hours.

4.0 SURVEILLANCE REQUIREMENTS

3. Pressure Suppression Chamber - Reactor Building Vacuum Breakers

   a. The pressure suppression chamber-reactor building vacuum breakers and associated instrumentation including set point shall be checked for proper operation every three months.

3.0 LIMITING CONDITIONS FOR OPERATION

e. One position alarm circuit can be inoperable providing that the redundant position alarm circuit is operable. Both position alarm circuits may be inoperable for a period not to exceed seven days provided that all vacuum breakers are operable.

f. If requirements of 3.7.A.4 cannot be met, the reactor shall be placed in a Cold Shutdown condition within 24 hours.

5. Primary Containment Oxygen Concentration

   a. The primary containment atmosphere shall be reduced to less than 4% oxygen by volume with nitrogen gas whenever the reactor is in the run mode, except as specified in 3.7.A.5.b.

   b. Within the 24-hour period after Thermal Power is $>15\%$ Rated Thermal Power following startup, to 24 hours prior to reducing Thermal Power to $<15\%$ Rated Thermal Power prior to the next scheduled reactor shutdown, the containment atmosphere oxygen concentration shall be reduced to less than 4% by volume, and maintained in this condition.

4.0 SURVEILLANCE REQUIREMENTS

b. When the position of any drywell-suppression chamber vacuum breaker valve is indicated to be not fully closed at a time when such closure is required, the drywell to suppression chamber differential pressure decay shall be demonstrated to be less than that shown on Figure 3.7.1 immediately and following any evidence of subsequent operation of the inoperable valve until the inoperable valve is restored to a normal condition.

c. When both position alarm circuits are made or found to be inoperable, the control panel indicator light status shall be recorded daily to detect changes in the vacuum breaker position.

5. Primary Containment Oxygen Concentration

   Whenever inerting is required, the primary containment oxygen concentration shall be measured and recorded on a weekly basis.

3.0 LIMITING CONDITIONS FOR OPERATION

c. Whenever primary containment oxygen concentration is equal to or exceeds 4% by volume, except as permitted by 3.7.A.5.b above, within the subsequent 24 hour period return the oxygen concentration to less than 4% by volume.

d. If the requirements of 3.7.A.5 cannot be met, reduce Thermal Power to $\leq 15\%$ Rated Thermal Power, within 8 hours.

B. Standby Gas Treatment System

1. Two separate and independent standby gas treatment system circuits shall be operable at all times when secondary containment integrity is required, except as specified in sections 3.7.B.1.(a) and (b).

   a. After one of the standby gas treatment system circuits is made or found to be inoperable for any reason, reactor operation and fuel handling is permissible only during the succeeding seven days, provided that all active components in the other standby gas treatment system are operable. Within 36 hours following the 7 days, the reactor shall be placed in a condition for which the standby gas treatment system is not required in accordance with Specification 3.7.C.2.(a) through (d).

4.0 SURVEILLANCE REQUIREMENTS

B. Standby Gas Treatment System

1. Once per month, operate each train of the standby gas treatment system for ≥ 10 continuous hours with the inline heaters operating.

3.0 LIMITING CONDITIONS FOR OPERATION

reactor core, operations with a potential for reducing the shutdown margin below that specified in specification 3.3.A, and handling of irradiated fuel or the fuel cask in the secondary containment are to be immediately suspended if secondary containment integrity is not maintained.

D. Primary Containment Isolation Valves (PCIVs)

1. During reactor power operating conditions, all Primary Containment automatic isolation valves and all primary system instrument line flow check valves shall be operable except as specified in 3.7.D.2.

4.0 SURVEILLANCE REQUIREMENTS

D. Primary Containment Isolation Valves (PCIVs)

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

   a. At least once per operating cycle the operable isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and closure times.

   b. At least once per operating cycle the primary system instrument line flow check valves shall be tested for proper operation.

   c. All normally open power-operated isolation valves shall be tested in accordance with the Inservice Testing Program. Main Steam isolation valves shall be tested (one at a time) with the reactor power less than 75% of rated.

   d. At least once per week the main steam-line power-operated isolation valves shall be exercised by partial closure and subsequent reopening.

3.0 LIMITING CONDITIONS FOR OPERATION

2. a. In the event one or more penetration flow paths with one PCIV inoperable, reactor operation in the run mode may continue provided that within the subsequent 4 hours (8 hours for MSIVs and 72 hours for EFCVs) restore the valve to operable status, or at least one valve in each line having an inoperable valve is deactivated in the isolated condition. This requirement may be satisfied by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow secured, except that a check valve cannot be used to isolate a penetration that has only one PCIV. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)*

   b. In the event one or more penetration flow paths with two PCIVs inoperable, reactor operation in the run mode may continue provided that within the subsequent 1 hour restore the valves to operable status, or at least one valve in each line having inoperable valves is deactivated in the isolated condition. This requirement may be satisfied by use of at least one closed and deactivated automatic valve, closed manual valve, or blind flange. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)*

* Isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under approved administrative controls.

4.0 SURVEILLANCE REQUIREMENTS

2. Whenever a containment penetration flow path is isolated by a valve deactivated in the isolated position to meet the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or the isolation device outside primary containment shall be recorded monthly.** For a containment penetration flow path isolated by a valve deactivated in the isolated position to meet the requirements of TS 3.7.D.2, the position of the deactivated and isolated valves or isolation devices inside primary containment which have not had their position recorded in the previous 92 days, shall have their position recorded prior to entering Startup or Hot Shutdown from Cold Shutdown, if the primary containment was de-inerted while in Cold Shutdown.*

* Isolated valves closed to satisfy these requirements may be reopened on an intermittent basis under approved administrative controls.

** Isolation devices in high radiation areas may be verified by use of administrative means.

3.0 LIMITING CONDITIONS FOR OPERATION	4.0 SURVEILLANCE REQUIREMENTS
3. a. The inerting and deinerting operations permitted by TS 3.7.A.5.b shall be via the 18-inch purge and vent valves (equipped with 40-degree limit stops) aligned to the Reactor Building plenum and vent. All other purging and venting, when primary containment integrity is required, shall be via the 2-inch purge and vent valve bypass line and the Standby Gas Treatment System.	3. Whenever containment purge and vent valves are isolated to meet the requirements of TS 3.7.D.3.b, the position of the deactivated and isolated valves outside primary containment shall be recorded monthly.**
b. In the event one or more penetration flow paths with one or more containment purge and vent valves not within purge and vent valve leakage limits, reactor operation in the run mode may continue provided that within the subsequent 24 hours, restore the valve(s) to within leakage limits, or at least one valve in each line having a purge and vent valve not within leakage limits is deactivated in the isolated position. This requirement may be satisfied by use of one closed and deactivated automatic valve, closed manual valve, or blind flange. (Deactivated means electrically or pneumatically disarm or otherwise secure the valve.)	4, The seat seals of the drywell and suppression chamber 18-inch purge and vent valves shall be replaced at least once every six operating cycles. If periodic Type C leakage testing of the valves performed per surveillance requirement 4.7.A.2.b identifies a common mode test failure attributable to seat seal degradation, then the seat seals of all drywell and suppression chamber 18-inch purge and vent valves shall be replaced.
4. If Specification 3.7.D.1, 3.7.D.2 and 3.7.D.3 cannot be met, initiate normal orderly shutdown and have reactor in the Cold Shutdown condition within 24 hours.	
	** Isolated valves in high radiation areas may be verified by use of administration means.

Bases 3.7 (Continued):

If a loss of coolant accident were to occur when the reactor water temperature is below 330°F, the containment pressure will not exceed the 62 psig design pressure, even if no condensation were to occur. The maximum allowable pool temperature, whenever the reactor is above 212°F, shall be governed by this specification. Thus, specifying water volume-temperature requirements applicable for reactor water temperatures above 212°F provides additional margin above that available at 330°F.

The large amount of water that must be added or removed to cause a significant change in the suppression chamber water inventory is not likely to go un-noticed. With a daily check of water level, there is an extremely low probability that a loss of coolant accident will occur simultaneously with water level being outside of the specified range.

Therefore, allowing up to 2 hours to restore level, should be acceptable for a limited time. The 2 hour completion time is sufficient to restore suppression pool water level to within limits.

vacuum breaker selector switch, and a common test switch. The reactor building vacuum breaker panel contains one red light and one green light for each of the eight valves. There are four independent limit switches on each valve. The two switches controlling the red lights are adjusted to provide an indication of disc opening of less than 1/8" at the bottom of the disc. These switches are also used to activate the valve position alarm circuits. The two switches controlling the green lights are adjusted to provide indication of the disc very near the full open position.

The control room alarm circuits are redundant and fail safe. This assures that no simple failure will defeat alarming to the control room when a valve is open beyond allowable and when power to the switches fails. The alarm is needed to alert the operator that action must be taken to correct a malfunction or to investigate possible changes in valve position status, or both. If the alarm cannot be cleared due to the inability to establish indication of closure of one or more valves, additional testing is required. The alarm system allows the operator to make this evaluation on a timely basis. The frequency of the testing of the alarms is the same as that required for the position indication system.

Operability of a vacuum breaker valve and the four associated indicating light circuits shall be established by cycling the valve. The sequence of the indicating lights will be observed to be that previously described. If both green light circuits are inoperable, the valve shall be considered inoperable and a pressure test is required immediately and upon indication of subsequent operation. If both red light circuits are inoperable, the valve shall be considered inoperable, however, no pressure test is required if positive closure indication is present.

Oxygen concentration is limited to 4% by volume to minimize the possibility of hydrogen combustion following a loss of coolant accident. Significant quantities of hydrogen could be generated if the core cooling systems failed to sufficiently cool the core. The occurrence of primary system leakage following a major refueling outage or other scheduled shutdown is more probable than the occurrence of the loss of coolant accident upon which the specified oxygen concentration limit is based. Permitting access to the drywell for leak inspections during a startup is judged prudent in terms of the added plant safety offered without significantly reducing the margin of safety. Thus, to preclude the possibility of starting the reactor and operating for extended periods of time with significant leaks in the primary system, leak inspections are scheduled during startup periods, when the primary system is at or near rated operating temperature and pressure. The 24-hour period to provide for inerting after Reactor Thermal Power is greater than 15% Rated Thermal Power, is judged to be sufficient to perform the leak inspection and establish the required oxygen concentration. If the containment atmosphere exceeds the oxygen concentration of $\geq 4\%$ by volume, then the oxygen concentration must be restored to $< 4\%$ by volume within the subsequent 24 hour period. The 24-hour period is allowed when oxygen concentration is $\geq 4\%$ by volume because of the low probability and long duration of an event that would generate significant amounts of hydrogen occurring during this period. The primary containment is normally slightly pressurized during periods of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, no monitoring of oxygen concentration is necessary. However, at least once a week the oxygen concentration will be determined as added assurance.

B. Standby Gas Treatment System and C. Secondary Containment

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

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the chimney during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. One standby gas treatment system circuit is designed to automatically start upon containment isolation and to maintain the reactor building pressure at the design negative pressure so that all leakage should be in-leakage. Should one circuit fail to start, the redundant alternate standby gas treatment circuit is designed to start automatically. Each of the two circuits has 100% capacity. Only one of the two standby gas treatment system circuits is needed to cleanup the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is no immediate threat to the containment system performance. Therefore, reactor operation or refueling operation may continue while repairs are being made. If neither circuit is operable, the plant is placed in a condition that does not require a standby gas treatment system.

Bases 3.7 (Continued):

While only a small amount of particulates are released from the primary containment as a result of the loss of coolant accident, high-efficiency particulate filters before and after the charcoal filters are specified to minimize potential particulate release to the environment and to prevent clogging of the charcoal adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The in-place test results should indicate a system leak tightness of less than 1% bypass leakage for the charcoal adsorbers using halogenated hydrocarbon and a HEPA filter efficiency of at least 99% removal of DOP particulates. Laboratory carbon sample test results indicate a radioactive methyl iodide removal efficiency for expected accident conditions. The allowable penetration for the laboratory test is based on 90% adsorber efficiency assumed in the off-site dose analysis and a safety factor of ≥ 2. Operation of the standby gas treatment circuits significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers. If the performance requirements are met as specified, the calculated doses would be less than the guidelines stated in 10 CFR 100 for the accidents analyzed.

D. Primary Containment Isolation Valves

The function of the Primary Containment Isolation Valves (PCIVs), in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents to within limits. The PCIVs help ensure that an adequate primary containment boundary is maintained during and after an accident by minimizing potential paths to the environment. Therefore, Technical Specifications requirements provide assurance that primary containment function assumed in the safety analysis will be maintained. These valves are either passive or active (automatic). Manual valves, deactivated automatic valves (including remote manual valves) secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices.

Closure of one of the valves in each line would be sufficient to maintain the integrity of the Primary Containment. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss-of-coolant accident. Details of the Primary Containment isolation valves are discussed in Section 5.2 of the USAR. A listing of all Primary Containment automatic isolation valves including maximum operating time is given in USAR Table 5.2-3b.

The Technical Specifications are modified by a footnote allowing penetration flow path(s) to be unisolated intermittently under Operations Committee approved administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve who is in constant communication with the control room. In this way, the penetration can be rapidly isolated when a need for the primary containment isolation is indicated.

With one or more penetration flow paths with one PCIV inoperable, the affected penetration must be returned to operable status or isolated within 4 hours (8 hours for MSIVs and 72 hours for EFCVs). The 4 hour completion time is reasonable considering the time required to isolate the penetration and the relative importance of supporting primary containment. The 8 hour completion time for MSIVs allows a period of time to restore the MSIVs to operable status given the fact that MSIV closure will result in a potential for plant shutdown. The 72 hour completion time for EFCVs is reasonable considering the instrument and the small diameter of the penetration piping combined with the ability of the penetration to act as an isolation boundary. With one or more penetrations with two PCIVs inoperable, either the inoperable PCIVs must be returned to operable status or the affected penetration flow path must be isolated within 1 hour.

Specification 3.7.D.3 requires the containment to be purged and vented through the standby gas treatment system except during inerting and deinerting operations. This provides for iodine and particulate removal from the containment atmosphere. Use of the 2-inch flow path prevents damage to the standby gas treatment system in the event of a loss of coolant accident during purging or venting. Use of the reactor building plenum and vent flow path for inerting and deinerting operations permits the control room operators to monitor the activity level of the resulting effluent by use of the Reactor Building Vent Wide Range Gas Monitors.

E. Combustible Gas Control System

The function of the Combustible Gas Control System (CGCS) is to maintain oxygen concentrations in the post-accident containment atmosphere below combustible concentrations. Oxygen may be generated in the hours following a loss of coolant accident from radiolysis of reactor coolant.

The Technical Specifications limit oxygen concentrations during operation to less than four percent by volume during operation. The maintenance of an inert atmosphere during operation precludes the build-up of a combustible mixture due to a fuel metal-water reaction. The other potential mechanism for generation of combustible mixtures is radiolysis of coolant which has been found to be small.

A special report is required to be submitted to the Commission to outline CGCS equipment failures and corrective actions to be taken if inoperability of one train exceeds thirty days. In addition, if both trains are inoperable for more than 30 days, the plant is required to shutdown until repairs can be made.

Bases 4.7 (Continued):

D. Primary Containment Isolation Valves

Those large pipes comprising a portion of the reactor coolant system whose failure could result in uncovering the reactor core are supplied with automatic isolation valves (except those lines needed for emergency core cooling system operation or containment cooling). The closure times specified in USAR Table 5.2-3b are adequate to prevent loss of more coolant from the circumferential rupture of any of these lines outside the containment than from a steam line rupture. Therefore, this isolation valve closure time is sufficient to prevent uncovering the core.

The primary containment isolation valves are highly reliable, have low service requirement, and most are normally closed. The initiating sensor and associated trip channels are also checked to demonstrate the capability for automatic isolation. Reference Section 5.2.2.5.3 and Table 5-2-3b USAR. The test interval of once per operating cycle for automatic initiation results in a failure probability of 1.1×10^{-7} that a line will not isolate. More frequent testing for valve operability results in a more reliable system.

Normally closed PCIVs are considered operable when:

Manual valves are closed, or opened in accordance with appropriate administrative controls, or

Automatic valves or remote manual valves are capable of performing their intended safety function, or

Automatic valves or remote manual valves are de-activated and secured in their closed position and this condition has been included in their design basis, or

Blind flanges are in place, or

Closed systems are intact.

With one or more penetration flow paths with one or more PCIVs inoperable, restore the valves to operable status or the affected penetration flow paths 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 criterion are a closed and de-activated automatic valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured, except that a check valve with flow through the valve secured, cannot be used to isolate a penetration with only one PCIV or a penetration with two inoperable PCIVs. For an isolated penetration the device used to isolate the penetration should be the closest available valve to the primary containment. Affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that primary containment penetrations required to be isolated following an accident, and no longer capable of being automatically isolated,

Bases 4.7 (Continued):

will be in the isolation position should an event occur. This required action does not require any testing or device manipulation. Rather, it involves verification that those devices outside containment and capable of potentially being mispositioned are in the correct position. The completion time of "monthly" for devices outside containment is appropriate because the devices are operated under administrative controls and the probability of their misalignment is low. For the devices inside primary containment, the time period specified "prior to entering Startup or Hot Shutdown from Cold Shutdown; if primary containment was deinerted while in Cold Shutdown, if not performed in the previous 92 days" is based on engineering judgement and is considered reasonable in view of the inaccessibility of the devices and other administrative controls ensuring that device misalignment is an unlikely possibility.

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