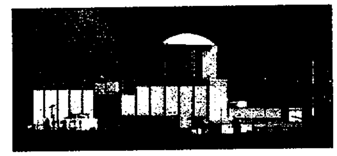
NRC-01-020

NMC
Committed to Nuclear Excellence

Kewaunee Nuclear Power Plant
N490, State Highway 42
Kewaunee, WI 54216-9511
920-388-2560

Operated by
Nuclear Management Company, LLC



March 7, 2001

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

10CFR50.90

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
PROPOSED AMENDMENT 165a TO THE KEWAUNEE NUCLEAR POWER PLANT TECHNICAL SPECIFICATIONS, CONTAINMENT ISOLATION DEVICES

References:
1) Letter from Mark L. Marchi (WPSC) to NRC Document Control Desk, dated January 13, 2000, "Proposed Amendment 165 to the Kewaunee Nuclear Power Plant Technical Specifications

2) Letter from John G. Lamb (NRC) to Mark Reddemann (NMC), dated February 1, 2001, "Kewaunee Nuclear Power Plant – Request for Additional Information Related to Proposed Amendment 165 for Technical Specifications, Containment Isolation (TAC NO. MA8017)

In reference 1, Wisconsin Public Service Corporation (WPSC) submitted proposed amendment (PA) 165 to the Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TS). This PA was submitted to revise TS section 3.6, "Containment," to add Limiting Condition for Operation (LCO) and Allowed Outage Times (AOT) for containment isolation devices. It also provided additional information, clarification, and uniformity to the basis of the associated TS. In reference 2, the Nuclear Regulatory Commission (NRC) staff transmitted a request for additional information (RAI) concerning WPSC's PA 165. This submittal is Nuclear Management Company, LLC, (NMC) response to the NRC staff RAI and replaces reference 1 in its entirety.

Based on the RAI and our responses, a number of the changes proposed in reference 1 have been modified. As a result we are resubmitting the proposed changes. Attachment 4 contains the NRC staffs RAI with the Nuclear Management Company, LLC, (NMC) response. Attachment 1 to this letter contains a description of the changes, a safety analysis, a significant hazards determination, and environmental considerations for the proposed changes. Attachment 2 contains the strike-out Technical Specification and basis pages: TS ii, TS 1.0-2, TS 3.6-1, TS 3.6-2, TS 3.6-3, TS 3.6-4, TS B3.6-1, TS B3.6-2, TS B3.6-3, TS B3.6-4, TS B3.6-5, TS 4.4-3, TS 4.4-4, TS B4.4-1, TS B4.4-3, and TS B4.4-4. Attachment 3 contains the affected Technical Specification and basis pages as revised.

3.6-2, TS 3.6-3, TS 3.6-4, TS B3.6-1, TS B3.6-2, TS B3.6-3, TS B3.6-4, TS B3.6-5, TS 4.4-3, TS 4.4-4, TS B4.4-1, TS B4.4-3, and TS B4.4-4. Attachment 3 contains the affected Technical Specification and basis pages as revised.
There is no propriety information in this submittal. NMC requests 60 days after NRC issuance of the amendment to implement.

In accordance with the requirements of 10 CFR 50.30(b), this submittal has been signed and notarized. A complete copy of this submittal has been transmitted to the State of Wisconsin as required by 10 CFR 50.91(b)(1).

Sincerely,

Mark E. Reddemann
Site Vice President

GOR

Attachments

Subscribed and Sworn to
Before Me This 7th Day
of March, 2001

Notary Public, State of Wisconsin

My Commission Expires:
February 27, 2005

cc -

US NRC Senior Resident Inspector
US NRC Region III
Electric Division, PSCW

ATTACHMENT 1

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

March 7, 2001

Proposed Amendment 165a

Description of Proposed Changes

Safety Analysis

Significant Hazards Determination

Environmental Consideration

Introduction

Current Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TS) lack clear guidance on Limiting Conditions for Operation (LCO) and Allowed Outage Times (AOT) concerning containment isolation devices and associated penetrations. The current TS that govern the containment isolation valves and associated penetrations state:

TS 1.0.g. 1 — *The nonautomatic Containment System isolation valves and blind flanges are closed as required.*

TS 1.0.g.4 — *The required automatic Containment System 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.*

TS 3.6.a — *CONTAINMENT SYSTEM INTEGRITY shall not be violated if there is fuel in the reactor which has been used for power operation, except whenever either of the following conditions remains satisfied:*

1. *The reactor is in the COLD SHUTDOWN condition with the reactor vessel head installed, or*
2. *The reactor is in the REFUELING shutdown condition.*

The purpose of this proposed amendment is to provide clear guidance that will allow time to correct an inoperable condition or to place the penetration in a safe condition if the inoperable condition can not be corrected.

This License Amendment Request (LAR) modifies Section 3.6, "Containment," of the KNPP TS. It will add Limiting Conditions for Operation (LCOs) and AOTs for containment penetrations and valves when they are found or made inoperable. TS section 1.0.g items TS 1.0.g.1 and TS 1.0.g.4 are also being modified to reference TS section 3.6 for the applicable LCOs and AOTs. To support this, changes have been added to section 4, "Surveillance Requirements," of TS. Administrative changes are also being proposed as a result of the reformatting of the proposed changes and to provide greater readability.

Summary of Basis for Change

The proposed changes are consistent with the current licensing basis of the KNPP TS and are modeled, as appropriate, after NUREG-1431, Rev. 1, "WOG Standard Technical Specification" (STS). NMC is proposing a 24-hour AOT for containment isolation valves, versus the STS AOT of 4 hours, which is consistent with KNPP current TS basis. Included in this request are several numbering and editorial changes, which are administrative in nature.

Description of Proposed Changes

1) TS section 1.0.g, "Containment System Integrity," TS section 3.6.b, "Containment Isolation Valves" and TS section 4.4.f, "Containment Isolation Device Position Verification," have been modified or added to provide delineation of the specifications for these valves. This change modified the requirements as follows:

- TS 1.0.g, the specification defining "Containment System Integrity," is being modified so items TS 1.0.g.1 and TS 1.0.g.4 allow exceptions delineated in TS 3.6.b for LCOs and AOTs associated with the containment isolation valves and other such devices used for containment isolation.

- TS 1.0.g required all manual valves and blind flanges to be closed as required. This amendment adds TS section 3.6.b, which will state that these components shall be operable and delineate their associated LCOs. The AOT requested is 24 hours for one inoperable valve versus the current TS, which does not have an AOT.

- TS 1.0.g required all automatic containment system isolation valves to be operable, or deactivated in the closed position, or at least one valve in each line having an inoperable valve closed. This proposed amendment adds TS section 3.6.b, which will specify an AOT of 24 hours, which is consistent with current TS AOT for a 480-volt bus being inoperable.

- An item from NUREG 1431 is being included in TS section 3.6 for containment penetrations unisolated under administrative controls. This allowance will provide for containment penetrations to be opened intermittently without entering an LCO for that penetration.

- Included in TS 3.6.b will be requirements for verification of penetration isolation. If an isolation device is located outside containment that device will be verified closed at least once per 31 days. If the device is inside containment it will be verified closed prior to exiting cold shutdown unless it has been previously verified closed within the last 92 days.

- A separate LCO and corresponding AOT has been added to incorporate the approval of Technical Specification Task Force (TSTF) Traveler, TSTF-30, which allows an AOT of 72 hours for those penetrations with a single containment isolation valve and a closed system.

- TS 3.6 have a modifier that allows verification of isolation devices being closed by administrative means if the device is in a high radiation area.

- Actions have been added to TS 3.6 to place the plant in a safe condition if the LCO's and associated AOT's cannot be met.

- TS Basis for TS 3.6.b was added to support the proposed TS changes.
- TS Section TS 4.4.f and TS basis section for TS 4.4.f were added to state position verification requirements and the associated basis for containment isolation devices which are included in STS but were not in the KNPP TS.

2) Administrative Changes

- Table of Contents pages TS i through TS iii are changed to show the addition of the Containment Isolation Valves section and the renumbering of the Shield Building Ventilation and Auxiliary Building Special Ventilation System technical specification sections.
- Various formatting changes are being made to Section 3.6 for clarity and uniformity.
- TS Basis section TS 3.6.c through TS 3.6.e were modified to identify which TS the basis sections applies to.

Safety Analysis of Proposed Change

Background

The Containment System is designed to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require. The principal function of the Containment Isolation System is to confine the fission products within the Primary Containment System boundary. Design limits for radiation doses resulting from accidental releases of radioactivity from a reactor plant are specified in 10 CFR 100. The off-site dose consequences for the loss-of-coolant accident (LOCA) are contained in the Updated Safety Analysis Report (USAR), Section 14.3.5, "Off-Site Dose Consequences." The containment vessel and its penetrations are designed to be essentially leak free and are demonstrated by tests to have a leakage rate not exceeding the allowable leakage rate (L_a) with margin. The proposed TS change does not affect the containment vessel design or its penetrations in any physical way.

Defense-In-Depth

This proposed amendment maintains the current defense-in-depth of the containment isolation system. Current Technical Specifications prevent plant heatup greater than 200°F (Cold Shutdown) until containment integrity is established. This precludes any energy/radiation releases due to a buildup of containment pressure from flashing of reactor coolant in the event of a system break. If containment integrity is lost while above 200°F the operators are directed to restore Containment Integrity within one hour.

To ensure at least one valve is closed when needed, two isolation barriers are provided per containment penetration thus ensuring single failure criteria is met. If there were a failure of an operable containment isolation valve to close, current plant Emergency Operating Procedures (E-0, "Reactor Trip or Safety Injection") directs the operators to manually close the valve. This proposed amendment does not change the current defense-in-depth concept. Thus, if an inoperable automatic isolation valve were open the redundant operable automatic isolation valve would close or the operators would close it. Also, if a penetration were unisolated under administrative controls the valve would be closed immediately.

Basis for Change

Change #1 – CIVs LCO's and AOT's

This proposed change modifies the requirements for containment isolation valves that are contained in the definition of "Containment System Integrity." The change in the definition section, TS 1.0.g, is in support of the modification being requested for TS section 3.6. Therefore the justification for this change is the acceptance of the modification to TS 3.6.

TS 3.6 is being modified to add explicit guidance for CIV LCOs, AOTs, and required compensatory measures. NMC is proposing two different AOTs for a single containment isolation inoperable valve. For open systems, a 24-hour AOT for a single inoperable CIV is being proposed A 72-hour AOT is being proposed for penetration isolation device in closed systems.

As stated in KNPP TS basis section 3.3, the purpose of LCOs and AOTs is to permit temporary outages of redundant components and are specified for specific time intervals that are consistent with maintenance. Inoperability of a single component does not negate the ability of the system to perform its function, but it reduces the redundancy provided in the plant design and thereby limits the ability to tolerate additional equipment failures. However, the equipment AOTs specified in the LCOs are a temporary relaxation of the single failure criterion, which, consistent with overall system reliability considerations, provides a limited time to restore equipment to the operable condition.

Kewaunee experience shows that 4 hours is not enough time to perform minor maintenance on containment isolation devices. Depending upon the failure mechanism the repairs may take 10 – 12 hours and the post maintenance testing may take another 6 – 10 hours. Therefore, the 24-hour AOT is consistent with previous minor maintenance philosophy.

A search was performed of the Licensing Basis for the Kewaunee Nuclear Power Plant. The only relevant information on the basis for an AOT for a containment isolation (CI) valve was found in the basis for TS Section 3.7, "Electrical Systems." This requested 24-hour inoperable time limitation is consistent with Kewaunee TS Section 3.7 basis.

Technical Specification Section 3.7, "Electrical Systems," TS 3.7.b.6, allows an individual 4160 Volt or 480 Volt ESF bus to be out of service for up to 24 hours. Included in the 480 volt bus loads, which would lose power when the 480 Volt ESF bus is out of service, are individual train containment isolation valves. TS Section 3.7 basis states:

> *"The intent of this TS is to provide assurance that at least one external source and one standby source of electrical power is always available to accomplish safe shutdown and containment isolation and to operate required engineered safety features equipment following an accident."*

Therefore, the original licensing basis of the plant allows one 4160 or 480 Volt ESF bus to be inoperable for 24 hours, which includes the associated containment isolation valves, such as motor operated valves that will fail as is. Thus, this TS change does not alter the original licensing.

Risk Insights

A risk assessment of the probability of a large break loss of coolant accident (LBLOCA), medium break LOCA (MBLOCA), and a small break LOCA (SBLOCA) with a train of containment isolation (CI) failing during a 4-hour verses a 24-hour time span was conducted, See Figure 1. This change in probability is considered insignificant. This calculation includes failures associated with:

(1) the CI signal,

(2) mechanical failures,

(3) operator errors, and

(4) common cause failures.

LOCA and CI Failure Probability		
Accident	4-Hour AOT	24-Hour AOT
LBLOCA	1.48×10^{-8}	8.86×10^{-8}
MBLOCA	6.82×10^{-8}	4.09×10^{-7}
SBLOCA	1.51×10^{-7}	9.08×10^{-7}

Figure 1

Additionally, the change in large early release frequency (ΔLERF) and incremental conditional large early release probability (ICLERP) was calculated using an AOT of 24-hours. This calculation is independent of the above LOCA calculation and includes all 16 initiating events in the Kewaunee internal events PRA. As the CI function is not a contributor to the Core Damage Frequency (CDF), a change in CDF and incremental conditional core damage probability (ICCDP) was not calculated. The large early release frequency (LERF) was recalculated assuming one train of CI was out of service. This LERF was compared to the base LERF and multiplied by 24 hours to obtain the ICLERP. The ΔLERF and ICLERP calculated equal 5.4×10^{-8}/yr and 1.5×10^{-10}respectively. The ΔLERF is below 1×10^{-7}, so it is characterized by Regulatory Guide 1.174 as very small. The ICLERP is below the 5×10^{-8} recommendation of Regulatory Guide 1.177 for consideration as having a small impact on plant risk.

The change was also reviewed for its impact on fire, flooding and external events. As with internal events, there would be no change in CDF. The total ΔLERF and ICLERP for internal fire, internal flooding, and seismic initiators is 3.9×10^{-7}/yr, and 1.1×10^{-9} respectively. These analyses are more conservative than the internal events analysis and these numbers should therefore be taken as bounding values. Summed together the total internal and external ΔLERF and ICLERP are 4.4×10^{-7}/yr and 1.2×10^{-9} respectively. The ΔLERF is in the 10^{-7} to 10^{-6} range (Region II of Figure 4 of Regulatory Guide 1.174). The combined internal and external events LERF is 7.2×10^{-7} even with the conservative external events methodology; this is below the Regulatory Guide 1.174 limit for a change of this magnitude. The total ICLERP is well below the Regulator Guide 1.177 value. Other external events (high winds, external fires, external flooding, transportation accidents, hazardous materials) were examined and determined to be unaffected by this change.

Based on a containment release rate of one containment volume per hour, only penetrations of 5 inches or greater were included in the LERF calculation. This list of included penetrations was further reduced by only including a penetration if the below Criterion 1 or all of the below Criterion 2A and 2B were met.

1. The line penetrating containment is a containment sump or reactor cavity sump drain line.

2A. The line penetrating containment directly communicates with either the containment atmosphere or the reactor coolant system, and

2B. The line penetrating containment is not part of a closed system outside of containment, capable of withstanding severe accident conditions.

This left two types of penetrations: (1) those that are administratively closed during the entire cycle and, (2) those that are isolated by two check valves. For this calculation it was assumed that one of the two check valves is out of service for these two remaining penetrations.

Precedents

An AOT of 24 hours has been granted previously to another licensee. NRC approved the AOT per letter, dated February 17, 1994 from the US NRC to Houston Lighting & Power Company, "Issuance of Amendment Nos. 59 and 47 to Facility Operating License Nos. NPF-76 and NPF-80 and Related Relief Requests – South Texas Project, Units 1 and 2 (TAC Nos. M76048 and M76049)." This approved amendment states the following for the LCO and AOT for containment isolation valves:

LIMITING CONDITION FOR OPERATION

3.6.3 The containment isolation valves shall be OPERABLE with isolation times less than or equal to the required isolation times.

APPLICABILITY: MODES 1, 2, 3 and 4 ACTION:

With one or more of the isolation valve(s) inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and:

a. Restore the inoperable valve(s) to OPERABLE status within 24 hours, or

b. Isolate each affected penetration within 24 hours by use of at least one deactivated automatic valve secured in the isolation position, or

c. Isolate each affected penetration within 24 hours by use of at least one closed manual valve or blind flange, or

d. Be in at least HOT STANDBY within the next 6 hours and in cold shutdown within the following 30 hours.

Conclusion

Based upon the consistency with KNPP's current licensing bases, the AOT philosophy for completion of maintenance, the PRA assessment results being below the Regulatory Guidelines for consideration as having a small impact on plant risk, and prior staff approval of this extension for another facility, KNPP believes this change does not result in a significant increase in the risk to the health and safety of the public.

General Design Criteria (GDC) 57 allows the use of a closed system in combination with a containment isolation valve to provide two containment barriers against the release of radioactive material following an accident. As such, the use of a closed system is no different from isolating a failed containment isolation valve by use of a single valve. TS 3.6.b.3.C provide the necessary time to perform repairs on a failed valve associated with a closed system. A completion time of 72 hours is considered appropriate given that certain valves may be located inside containment, the reliability of a closed system, and that 72 hours is typically provided for losing one train of redundancy. This request is consistent with the Nuclear Electric Institute (NEI) Technical Specification Task Force (TSTF) traveler TSTF 30, Rev 3. In the document the NRC determined the AOT for an inoperable isolation valve for a closed system could be extended to 72 hours.

TS 3.6.b.2 is being added to allow unisolating a penetration under administrative control without entering an LCO for the penetration. This requirement credits operator action to isolate the penetration, if needed. This action is acceptable, because an individual will be dedicated to this operation; they will have continuous communications with the control room where annunciators indicate the need for containment isolation. When informed that action is required to isolate the penetration the dedicated individual will manually close the valve by either positioning a switch or hand closing the valve. This action would normally be accomplished from the control room but may be done in the auxiliary building prior to any potentially harsh or inhospitable environmental conditions. As this is a simple task, no specific training or procedures are required.

TS 3.6.3.b has been added to require verification that inoperable penetrations have at least one closed isolation device. This ensures that containment penetrations required to be isolated following an accident and not capable of automatic isolation will be in the isolated position should an event occur. The Completion Time of "once per 31 days for isolation devices outside containment" is appropriate considering the fact that the devices are operated under administrative controls and the probability of their misalignment is low. For isolation devices inside containment, the time period specified as "prior to entering intermediate shutdown from cold shutdown if not performed within the previous 92 days" is based on engineering judgment. This is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility. If the isolation valves are in a high radiation area, verification of valve position by administrative means is allowed. 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 to be in the proper position, is small. This is a new requirement being added to KNPP TS and is therefore conservative in nature.

The surveillance sections of the TS, TS Section 4.4, were changed to incorporate verification requirements for containment isolation valves. These requirements are more restrictive than previous. A relaxation of the verification requirements is added to allow valves and blind flanges located in high radiation areas to be verified closed by use of administrative means. Allowing verification by administrative means is acceptable, since access to these areas is typically restricted during plant operation. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in their proper position is small. This is a new requirement being added to KNPP TS and is therefore conservative in nature.

Change #2 – Administrative Changes

The Table of Contents is being changed to reflect the changes made due to the addition of section TS 3.6.b, TS 4.4.f. Also included is the renumbering of section TS 3.6.c through TS 3.6.e due to the addition of TS 3.6.b. Other formatting changes were made to TS section 3.6.

Significant Hazards Determination of Proposed Change

The proposed changes provide a 24-hour Allowed Outage Time (AOT) for containment isolation valves (CIVs) in open systems, a 72-hour AOT in closed system, adds requirements to perform additional surveillance, allows opening of CIVs under administrative control, and makes minor administrative changes. These changes were reviewed in accordance with 10 CFR 50.92 to show no significant hazard exists. The proposed change will not:

1. **Involve a significant increase in the probability or consequences of an accident previously evaluated**.

   The 24-hour or 72-hour AOT proposed Technical Specification change provides definition for the AOT for a containment isolation valve. The original design and design basis of the plant is still maintained and the probability and consequences of previously evaluated accidents is unchanged.

   In our current Technical Specifications the allowed outage time for a safeguards 480-volt bus is 24 hours. The basis for this outage time states:

   > *"The intent of this TS is to provide assurance that at least one external source and one standby source of electrical power is always available to accomplish safe shutdown and containment isolation and to operate required engineered safety features equipment following an accident."*

With one 480-volt safeguards bus out of service an associated motor operated containment isolation valve is also out of service. Since the 24-hour AOT is part of Kewaunee's original design basis, allowing the containment isolation valves to be out of service for 24 hours does not increase the probability or consequences of an accident previously evaluated.

A risk assessment of the probability of a loss-of-coolant-accident with a train of containment isolation failing during a 4-hour verses a 24-hour time span was conducted. This change in probability is considered insignificant.

The NRC has previously reviewed the implementation of a 72-hour AOT. This review was documented under the Technical Specification Task Force (TSTF) traveler designated TSTF-30. TSTF-30 stated that the 72-hour period is considered appropriate given that certain valves may be located inside containment, the reliability of the closed system and that 72 hours is typically provided for losing one train of redundancy throughout the NUREGs.

Periodic verification of valve position following isolation is a new requirement. This verification does not change the status of the plant but ensures the required valve position is maintained. The administrative changes also do not change the status of the plant equipment.

Intermittent opening of an isolated penetration flowpath under administrative control maintains comparable protection as an automatic isolation signal. If conditions were to exist, which require containment isolation, a dedicated operator would be instructed to isolate the penetration flowpath immediately. Based on the intermittent opening and immediate isolation, there is not a significant increase in the probability or consequences of an accident previously evaluated.

The administrative changes proposed under this request are due to the addition of TS 3.6.b and TS 4.4.f, which were inserted into the current TS. The content of the TS renumbered has not changed.

Based on this discussion these changes do not involve any physical changes to structures, systems or components. The current safety analysis and design basis for the accident mitigation functions of the containment and the containment isolation valves are maintained. On-site and off-site dose consequences remain unaffected.

Therefore there is no **significant increase in the probability or consequences of an accident previously evaluated.**

2. **Create the possibility of a new or different kind of accident from any accident previously evaluated.**

The function of the containment vessel is to contain the radiologically hazardous material following a LOCA. By maintaining at least one containment isolation barrier intact the vessel can perform its function. This amendment still ensures that at least one barrier is intact or the leakage is evaluated not to exceed that which is already evaluated and allowed by current Technical Specifications.

The accidents considered are found in the Safety Analysis, Section 14 of the Updated Safety Analysis Report (USAR). The proposed change does not involve a change to the plant design (structures, systems or components). No new failure mechanisms beyond those already considered in the current plant Safety Analysis are introduced. No new accident is introduced and no safety-related equipment or safety functions are altered. The proposed change does not affect any of the parameters or conditions that contribute to initiation of any accidents.

Thus, this proposed amendment does not **create the possibility of a new or different kind of accident from any accident previously evaluated.**

3. **Involve a significant reduction in a margin of safety.**

With one containment barrier operable during plant operation the isolation of containment is still ensured. The plant's original design basis already addressed the inability of one of the two containment isolation valves to operate for a 24-hour period. TSTF-30 states that the reliability of a closed system justifies the increase in AOT to 72 hours. The additional surveillance performed to verify CIV positions enhances the confidence in the integrity of the containment structure and unisolating a penetration under administrative controls provides similar assurance of isolation as an automatic isolation feature.

Thus, this proposed amendment does not involve a significant reduction in a margin of safety.

Environmental Considerations of Proposed Change

This proposed amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or a change to an inspection or surveillance requirement. NMC has determined that the proposed amendment involves no significant hazards consideration and no significant change in the types, or significant increase in the amounts of any effluents that may be released off-site and that there is no significant increase in the individual or cumulative occupational radiation exposure. Accordingly, this proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with this proposed amendment.

ATTACHMENT 2

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

March 7, 2001

Proposed Amendment 165a

Strike-Out TS Pages:

Table of Contents TS ii
TS 1.0-2
TS 3.6-1 through TS 3.6-4
TS B3.6-1 through TS B3.6-5
TS 4.4-3
TS 4.4-4
TS B4.4-1
TS B4.4-3
TS B4.4-4

Section	Title	Page

e. <u>OPERABLE-OPERABILITY</u>

A system or component is OPERABLE or has OPERABILITY when it is capable of performing its intended function within the required range. The system or component shall be considered to have this capability when: (1) it satisfies the LIMITING CONDITIONS FOR OPERATION defined in TS 3.0; and (2) it has been tested periodically in accordance with TS 4.0 and has met its performance requirements.

Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that is required for the system or component to perform its intended function is also capable of performing their related support functions.

f. <u>OPERATING</u>

A system or component is considered to be OPERATING when it is performing the intended function in the intended manner.

g. <u>CONTAINMENT SYSTEM INTEGRITY</u>

CONTAINMENT SYSTEM INTEGRITY is defined to exist when:

1. The nonautomatic Containment System isolation valves and blind flanges are closed, except as provided in TS 3.6.~~bas required~~.
2. The Reactor Containment Vessel and Shield Building equipment hatches are properly closed.
3. At least ONE door in both the personnel and the emergency airlocks is properly closed.
4. The required automatic Containment System isolation valves are OPERABLE, except as provided in TS 3.6.~~bor are deactivated in the closed position or at least one valve in each line having an inoperable valve is closed~~.
5. All requirements of TS 4.4 with regard to Containment System leakage and test frequency are satisfied.
6. The Shield Building Ventilation System and the Auxiliary Building Special Ventilation System satisfy the requirements of TS 3.6.~~b~~c.

3.6 CONTAINMENT SYSTEM

APPLICABILITY

Applies to the integrity of the Containment System.

OBJECTIVE

To define the operating status of the Containment System.

SPECIFICATION

a. CONTAINMENT SYSTEM INTEGRITY shall not be violated if there is fuel in the reactor which has been used for power operation, except whenever either of the following conditions remains satisfied:

   1. The reactor is in the COLD SHUTDOWN condition with the reactor vessel head installed, or

   2. The reactor is in the REFUELING shutdown condition.

b. Containment Isolation Valves

   1. When CONTAINMENT SYSTEM INTEGRITY is required, all containment isolation valves and blind flanges shall be OPERABLE, except as permitted by TS 3.6.b.2 and TS 3.6.b.3.

   2. Containment Penetration flow paths can be unisolated intermittently under administrative controls.

   3. When CONTAINMENT SYSTEM INTEGRITY is required, the following conditions of inoperability may exist during the time interval specified:

      A. For one or more penetration flow paths with two containment isolation valves per penetration and one containment isolation valve inoperable:

         1. Return the valve to OPERABLE status within 24 hours or isolate the affected penetrations flow path by use of at least one:

            a) Closed and de-activated automatic valve, or

            b) Closed manual valve, or

            c) Blind flange, or

            d) Check valve with flow through the valve secured

2. Verify the affected flow path is isolated:

a) For isolation devices outside containment, at least once per 31 days, or

b) For isolation devices inside containment, prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

B. For one or more penetration flow paths with two containment isolation valves per penetration and two containment isolation valves inoperable:

1. Return at least one isolation valve to an OPERABLE status within 1 hour or isolate the affected flow path by use of at least one:

a) Closed and de-activated automatic valve, or

b) Closed manual valve, or

c) Blind flange.

2. Verify the affected flow path is isolated:

a) For isolation devices outside containment, at least once per 31 days, or

b) For isolation devices inside containment, prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

C. For one or more penetration flow paths with one containment isolation valve and a closed system per penetration and one containment isolation valve inoperable:

1. Return the valve to OPERABLE status within 72 hours or isolate the affected penetrations flow path by use of at least one:

a) Closed and de-activated automatic valve, or

b) Closed manual valve, or

c) Blind flange.

2. Verify the affected flow path is isolated:

   a) For isolation devices outside containment, at least once per 31 days, or

   b) For isolation devices inside containment, prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

D. Valves and blind flanges in high radiation areas may be verified, as required by TS 3.6.b.3.A.2, TS 3.6.b.3.B.2, and TS 3.6.b.3.C.2, by use of administrative controls.

4. If CONTAINMENT SYSTEM INTEGRITY is required and the OPERABILITY requirements of TS 3.6.b.2 or TS 3.6.b.3 are not met within the times specified, then initiate action to:

   A. Achieve HOT STANDBY within the next 6 hours,

   B. Achieve HOT SHUTDOWN within the following 6 hours, and

   C. Achieve COLD SHUTDOWN within the next 36 hours.

~~b~~c. All of the following conditions shall be satisfied whenever CONTAINMENT SYSTEM INTEGRITY, as defined by TS 1.0.g, is required:

1. Both trains of the Shield Building Ventilation System, including filters and heaters shall be OPERABLE or the reactor shall be shut down within 12 hours, except that when one of the two trains of the Shield Building Ventilation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 7 days.

2. Both trains of the Auxiliary Building Special Ventilation System including filters and heaters shall be OPERABLE or the reactor shall be shut down within 12 hours, except that when one of the two trains of the Auxiliary Building Special Ventilation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 7 days.

3. Performance Requirements

A. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show ≥ 99% DOP removal and ≥ 99% halogenated hydrocarbon removal.

B. The results of laboratory carbon sample analysis from the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System carbon shall show ≥ 90% radioactive methyl iodide removal at conditions of 130°C, 95% RH for the Shield Building Ventilation System and 66°C, 95% RH for the Auxiliary Building Special Ventilation System.

C. Fans shall operate within ± 10% of design flow when tested.

ed. If the internal pressure of the reactor containment vessel exceeds 2 psi, the condition shall be corrected within 8 hours or the reactor shall be placed in a subcritical condition.

de. The reactor shall not be taken above the COLD SHUTDOWN condition unless the containment ambient temperature is > 40°F.

BASIS

Containment System (TS 3.6)

Containment System Integrity (TS 3.6.a)

The COLD SHUTDOWN condition precludes any energy releases or buildup of containment pressure from flashing of reactor coolant in the event of a system break. The restriction to fuel that has been irradiated during power operation allows initial testing with an open containment when negligible activity exists. The shutdown margin for the COLD SHUTDOWN condition assures subcriticality with the vessel closed even if the most reactive RCC assembly were inadvertently withdrawn. Therefore, the two parts of TS 3.6.a allow CONTAINMENT SYSTEM INTEGRITY to be violated when a fission product inventory is present only under circumstances that preclude both criticality and release of stored energy.

When the reactor vessel head is removed with the CONTAINMENT SYSTEM INTEGRITY violated, the reactor must not only be in the COLD SHUTDOWN condition, but also in the REFUELING shutdown condition. A 5% shutdown margin is specified for REFUELING conditions to prevent the occurrence of criticality under any circumstances, even when fuel is being moved during REFUELING operations.

This specification also prevents positive insertion of reactivity whenever Containment System integrity is not maintained if such addition would violate the respective shutdown margins. Effectively, the boron concentration must be maintained at a predicted concentration of 2,100 ppm[(1)] or more if the Containment System is to be disabled with the reactor pressure vessel open.

Containment Isolation Valves (TS 3.6.b)

Containment isolation valves form a part of the containment boundary. The containment isolation valves' safety function is related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during a DBA.

To be considered OPERABLE, automatic containment isolation valves are required to close within prescribed time limits and to actuate on an automatic isolation signal. Check valves are considered OPERABLE when they have satisfactorily completed their required surveillance testing. Manual isolation components are considered OPERABLE when manual valves are closed, blind flanges are in place, and closed systems are intact.

Penetration flow path(s) may be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in

(1) USAR Table 3.2-1

continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Specification TS 3.6.b.2 pertains to inoperable valves described in TS 3.6.b.3, manual valves assumed to be closed, and normally closed valves that are not assumed, by the USAR, to automatically close. This allows opening of containment isolation valves without entering the LCO or to open containment isolation valves closed as required by TS, provided the administrative controls are in place to ensure valve closure, if needed.

For these LCO(s), separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable containment isolation valve. Complying with the Required Actions may allow for continued operation, and subsequent inoperable containment isolation valves are governed by subsequent Condition entry and application of associated Required Actions.

In the event a containment isolation valve in one or more penetration flow paths is inoperable, the affected penetration flow path must be isolated within the specified time constraints. 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 1) a closed and de-activated automatic containment isolation valve, 2) a closed manual valve, 3) a blind flange, and 4) a check valve with flow through the valve secured. For a penetration flow path isolated, the device used to isolate the penetration should be the closest available one to containment. The 24-hour completion time is reasonable, considering the time required to isolate the penetration, perform maintenance, and the relative importance of supporting containment OPERABILITY.

For affected containment penetration flow paths that cannot be restored to OPERABLE status within the required completion time and that have been isolated, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure containment penetrations, requiring isolation following an accident and no longer capable of being automatically isolated, will be in that isolated position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. For the isolation devices inside containment, the time period is specified as "prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days." This is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

With two containment isolation valves in one or more penetration flow paths inoperable, the affected penetration flow path must be isolated within 1 hour. 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, and a blind flange. The 1-hour Completion Time is consistent with the ACTIONS of LCO 3.0.c. In the event the affected penetration is isolated, the affected penetration must be verified to be isolated on a periodic basis which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of "once per 31 days for verifying each affected penetration flow path is isolated" is appropriate considering the fact that the valves are operated under administrative control and the probability of their misalignment is low.

For those penetrations where one of the isolation devices is a closed system, either inside containment or outside containment, a longer outage time is allowed. This condition is only applicable to those penetration flow paths with a single containment isolation valve and a closed system. This longer outage time is due to a closed system subjected to leakage testing, missile protected, and seismic category I piping. Also, a closed system typically has flow through it during normal operation such that any loss of integrity could be observed through leakage detection system inside containment and system walkdowns outside containment. Thus, a 72-hour completion time is considered appropriate given that certain valves may be located inside containment and the reliability of the closed system.

Isolation devices located in high radiation areas shall be verified closed by use of administrative means. 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 to be in the proper position is small.

De-activation of an automatic containment isolation valve is accomplished by removing or interrupting the valves motive force, thus, preventing a change in the valve position by a single active failure. De-activation may be accomplished by opening the supply breaker for a motor operated valve, isolating air to an air operated valve, removing the supply fuse for a solenoid operated valve, or any other means for ensuring the isolation barrier cannot be affected by a single active failure.

Ventilation Systems (TS 3.6.c)

Proper functioning of the Shield Building Ventilation System is essential to the performance of the Containment System. Therefore, except for reasonable periods of maintenance outage for one redundant train of equipment, the complete system should be in readiness whenever CONTAINMENT SYSTEM INTEGRITY is required. Proper functioning of the Auxiliary Building Special Ventilation System is similarly necessary to preclude possible unfiltered leakage through penetrations that enter the Special Ventilation Zone (Zone SV).

Both the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System are designed to automatically start following a safety injection signal. Each of the two trains of both systems has 100% capacity. If one train of either system is found to be inoperable, there is not an immediate threat to the containment system performance and reactor operation may continue while repairs are being made. If both trains of either system are inoperable, the plant will be brought to a condition where the air purification system would not be required.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential radioiodine release to the atmosphere. Bypass leakage for the charcoal adsorbers and particulate removal efficiency for HEPA filters are determined by halogenated hydrocarbon and DOP respectively. The laboratory carbon sample test results indicate a radioactive methyl iodine removal efficiency under test conditions which are more severe than accident conditions.

Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers. The performance criteria for the safeguard ventilation fans are stated in Section 5.5 and 9.6 of the USAR. If the performances are as specified, the calculated doses would be less than the guidelines stated in 10 CFR Part 100 for the accidents analyzed.

In-place testing procedures will be established utilizing applicable sections of ANSI N510 - 1975 standard as a procedural guideline only.

Containment Pressure (TS 3.6.d)

The 2 psi limit on internal pressure provides adequate margin between the maximum internal pressure of 46 psig and the peak accident pressure resulting from the postulated Design Basis Accident as discussed in Sections 14.2 and 14.3 of the USAR.[2]

The reactor containment vessel is designed for 0.8 psi internal vacuum, the occurrence of which will be prevented by redundant vacuum breaker systems.

Containment Temperature (TS 3.6.e)

The requirement of a 40°F minimum containment ambient temperature is to assure that the minimum containment vessel metal temperature is well above NDTT + 30° criterion for the shell material.

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[2] USAR Section 5

d. Auxiliary Building Special Ventilation System

1. Periodic tests of the Auxiliary Building Special Ventilation System, including the door interlocks, shall be performed in accordance with TS 4.4.c.1 through TS 4.4.c.3, except for TS 4.4.c.2.d.

2. Each train of Auxiliary Building Special Ventilation System shall be operated with the heaters on at least 15 minutes every month.

3. Each system shall be determined to be operable at the time of periodic test if it starts with coincident isolation of the normal ventilation ducts and produces a measurable vacuum throughout the special ventilation zone with respect to the outside atmosphere.

e. Containment Vacuum Breaker System

The power-operated valve in each vent line shall be tested during each refueling outage to demonstrate that a simulated containment vacuum of 0.5 psig will open the valve and a simulated accident signal will close the valve. The check and butterfly valves will be leak tested in accordance with TS 4.4.b during each refueling, except that the pressure will be applied in a direction opposite to that which would occur post-LOCA.

f. Containment Isolation Device Position Verification

1. When the reactor is critical, verify each 36 inch containment purge and vent isolation valve is sealed closed every 31 days.

2. When the reactor is critical, verify each 2 inch containment vent isolation valve is closed every 31 days, except when the 2 inch containment vent isolation valves are open for pressure control, ALARA, or air quality considerations for personnel entry, or Surveillances that require the valves to be open.

3. Containment isolation manual valves and blind flanges shall be verified closed as specified in TS 4.4.f.3.a and TS 4.4.f.3.b, except as allowed by TS 4.4.f.3.c.

   a. When greater than COLD SHUTDOWN, verify each containment isolation manual valve and blind flange that is located outside containment and required to be closed during accident conditions is closed every 31 days, except for containment isolation valves that are locked, sealed, or otherwise secured closed or open as allowed by TS 3.6.b.2.

b. Prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN, if not performed in the previous 92 days, verify each containment isolation manual valve and blind flange that is located inside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are locked sealed or otherwise secured closed or open as allowed by TS 3.6.b.2.

c. Valves and blind flanges in high radiation areas may be verified by use of administrative means.

Amendment No. ~~136~~ PA 165a
~~05/28/98~~ 03/02/2001

BASIS

Background - Containment ~~System~~Tests (TS 4.4)

The Containment System is designed to provide protection for the public from the consequences of a Design Basis Accident.[1] The Design Basis Accident is an instantaneous double-ended rupture of the cold leg of the Reactor Coolant System. Pressure and temperature behavior subsequent to the accident was determined by calculations evaluating the combined influence of the energy sources, the heat sinks and engineered safety features. The assumptions and effects for containment vessel leakage rate are detailed in the USAR[2] and further amplified in one of its Appendices.[3]

The total containment system consists of two systems. The Primary Containment System consists of a steel structure and its associated engineered safety features systems. The Primary Containment System, also referred to as the Reactor Containment Vessel, is a low-leakage steel shell, including all of its penetrations, designed to confine the radioactive materials that could be released by accidental loss of integrity of the Reactor Coolant System pressure boundary. It is designed for a maximum internal/test pressure of 46 psig and a temperature of 268°F.

The Secondary Containment System consists of the Shield Building, its associated engineered safety features systems, and a Special Ventilation Zone in the Auxiliary Building. The Shield Building is a medium-leakage concrete structure surrounding the Reactor Containment Vessel and is designed to provide a means for collection and filtration of fission-product leakage from the Reactor Containment Vessel following the Design Basis Accident. A 5-ft. annular space is provided between the Reactor Containment Vessel and the Shield Building. The Shield Building Ventilation System is the engineered safety feature utilized for the collection and filtration of fission-product leakage from the containment vessel.

The Special Ventilation Zone of the Auxiliary Building provides a medium-leakage boundary which confines leakage that could conceivably bypass the Shield Building annulus. The safety system associated with the Auxiliary Building Special Ventilation Zone is the Auxiliary Building Special Ventilation System (ABSVS). One of the functions of the ABSVS is to collect and filter any potential fission products that may bypass the Shield Building annulus.

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[1] USAR Section 14.3

[2] USAR Section 14.3.5

[3] USAR Appendix H

Auxiliary Building Special Ventilation System (TS 4.4.d)

Demonstration of the automatic initiation capability is necessary to assure system performance capability.[5]

Periodic checking of the inlet heaters and associated controls for each train will provide assurance that the system has the capability of reducing inlet air humidity so that charcoal adsorber efficiency is enhanced.

In-place testing procedures will be established utilizing applicable sections of ANSI N510-1975 standard as a procedural guideline.

Vacuum Breaker Valves (TS 4.4.e)

The vacuum breaker valves are 18 inch butterfly valves with air to open, spring to close operators. The valve discs are center pivot and rotate when closing to an EPT base material seat. When closed, the disc is positioned fully on the seat regardless of flow or pressure direction. Testing these valves in a direction opposite to that which would occur post-LOCA verifies leakage rates of both the vacuum breaker valves and the check valves downstream.

Isolation Device Positions (TS 4.4.f)

TS 4.4.f.1 ensures each 36 inch containment purge valve is verified sealed closed at 31-day intervals.[6] This Surveillance is designed to ensure that an inadvertent or spurious opening of a containment purge valve does not cause a gross breach of containment. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit off-site doses. Therefore, these valves are required to be in the sealed closed position when critical. A containment purge valve that is sealed closed must be closed with its control switch sealed in the close position. In this application, the term "sealed" has no connotation of leak tightness. The frequency is a result of a NRC initiative, Generic Issue B-24, related to containment purge valve use during plant operations.

TS 4.4.f.2 ensures the 2-inch vent/purge valves are closed as required or, if open, open for an allowable reason. If a 2-inch vent/purge valve is open in violation of this TS, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The TS is not required to be met when the 2-inch vent/purge valves are open for the reasons stated. The valves may be opened for pressure control, ALARA, or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The 2-inch vent/purge valves are capable of closing in the environment following a

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(5) USAR Section 9.6

(6) Letter from Steven A. Varga (NRC) to C.W. Giesler (WPSC) dated April 22, 1983

LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day frequency is consistent with other containment isolation valve requirements discussed.

TS 4.4.f.3.A requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed. The TS helps to ensure that post-accident leakage of radioactive fluids or gases outside of the containment boundary are within design limits. This TS does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The TS specifies that containment isolation valves that are open under administrative controls are not required to meet the TS during the time the valves are open. This TS does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

TS 4.4.f.3.B requires verification that each containment isolation manual valve and blind flange located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions, is closed. The TS helps to ensure that post-accident leakage of radioactive fluids or gases outside of the containment boundary is within design limits. For containment isolation valves inside containment, the frequency of "prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days" is appropriate since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. The TS specifies that containment isolation valves that are open under administrative controls are not required to meet the TS during the time they are open. This TS does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

TS 4.4.f.3.C modifies TS 4.4.f.3 for valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted when above COLD SHUTDOWN for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

ATTACHMENT 3

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

March 7, 2001

Proposed Amendment 165a

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e. OPERABLE-OPERABILITY

A system or component is OPERABLE or has OPERABILITY when it is capable of performing its intended function within the required range. The system or component shall be considered to have this capability when: (1) it satisfies the LIMITING CONDITIONS FOR OPERATION defined in TS 3.0; and (2) it has been tested periodically in accordance with TS 4.0 and has met its performance requirements.

Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that is required for the system or component to perform its intended function is also capable of performing their related support functions.

f. OPERATING

A system or component is considered to be OPERATING when it is performing the intended function in the intended manner.

g. CONTAINMENT SYSTEM INTEGRITY

CONTAINMENT SYSTEM INTEGRITY is defined to exist when:

1. The nonautomatic Containment System isolation valves and blind flanges are closed, except as provided in TS 3.6.b.
2. The Reactor Containment Vessel and Shield Building equipment hatches are properly closed.
3. At least ONE door in both the personnel and the emergency airlocks is properly closed.
4. The required automatic Containment System isolation valves are OPERABLE, except as provided in TS 3.6.b.
5. All requirements of TS 4.4 with regard to Containment System leakage and test frequency are satisfied.
6. The Shield Building Ventilation System and the Auxiliary Building Special Ventilation System satisfy the requirements of TS 3.6.c.

3.6 CONTAINMENT SYSTEM

APPLICABILITY

Applies to the integrity of the Containment System.

OBJECTIVE

To define the operating status of the Containment System.

SPECIFICATION

a. CONTAINMENT SYSTEM INTEGRITY shall not be violated if there is fuel in the reactor which has been used for power operation, except whenever either of the following conditions remains satisfied:

   1. The reactor is in the COLD SHUTDOWN condition with the reactor vessel head installed, or

   2. The reactor is in the REFUELING shutdown condition.

b. Containment Isolation Valves

   1. When CONTAINMENT SYSTEM INTEGRITY is required, all containment isolation valves and blind flanges shall be OPERABLE, except as permitted by TS 3.6.b.2 and TS 3.6.b.3.

   2. Containment Penetration flow paths can be unisolated intermittently under administrative controls.

   3. When CONTAINMENT SYSTEM INTEGRITY is required, the following conditions of inoperability may exist during the time interval specified:

      A. For one or more penetration flow paths with two containment isolation valves per penetration and one containment isolation valve inoperable:

         1. Return the valve to OPERABLE status within 24 hours or isolate the affected penetrations flow path by use of at least one:

            a) Closed and de-activated automatic valve, or

            b) Closed manual valve, or

            c) Blind flange, or

            d) Check valve with flow through the valve secured

2. Verify the affected flow path is isolated:

   a) For isolation devices outside containment, at least once per 31 days, or

   b) For isolation devices inside containment, prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

B. For one or more penetration flow paths with two containment isolation valves per penetration and two containment isolation valves inoperable:

   1. Return at least one isolation valve to an OPERABLE status within 1 hour or isolate the affected flow path by use of at least one:

      a) Closed and de-activated automatic valve, or

      b) Closed manual valve, or

      c) Blind flange.

   2. Verify the affected flow path is isolated:

      a) For isolation devices outside containment, at least once per 31 days, or

      b) For isolation devices inside containment, prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

C. For one or more penetration flow paths with one containment isolation valve and a closed system per penetration and one containment isolation valve inoperable:

   1. Return the valve to OPERABLE status within 72 hours or isolate the affected penetrations flow path by use of at least one:

      a) Closed and de-activated automatic valve, or

      b) Closed manual valve, or

      c) Blind flange.

2. Verify the affected flow path is isolated:

a) For isolation devices outside containment, at least once per 31 days, or

b) For isolation devices inside containment, prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

D. Valves and blind flanges in high radiation areas may be verified, as required by TS 3.6.b.3.A.2, TS 3.6.b.3.B.2, and TS 3.6.b.3.C.2, by use of administrative controls.

4. If CONTAINMENT SYSTEM INTEGRITY is required and the OPERABILITY requirements of TS 3.6.b.2 or TS 3.6.b.3 are not met within the times specified, then initiate action to:

A. Achieve HOT STANDBY within the next 6 hours,

B. Achieve HOT SHUTDOWN within the following 6 hours, and

C. Achieve COLD SHUTDOWN within the next 36 hours.

c. All of the following conditions shall be satisfied whenever CONTAINMENT SYSTEM INTEGRITY, as defined by TS 1.0.g, is required:

1. Both trains of the Shield Building Ventilation System, including filters and heaters shall be OPERABLE or the reactor shall be shut down within 12 hours, except that when one of the two trains of the Shield Building Ventilation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 7 days.

2. Both trains of the Auxiliary Building Special Ventilation System including filters and heaters shall be OPERABLE or the reactor shall be shut down within 12 hours, except that when one of the two trains of the Auxiliary Building Special Ventilation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 7 days.

3. Performance Requirements

A. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show ≥ 99% DOP removal and ≥ 99% halogenated hydrocarbon removal.

B. The results of laboratory carbon sample analysis from the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System carbon shall show ≥ 90% radioactive methyl iodide removal at conditions of 130°C, 95% RH for the Shield Building Ventilation System and 66°C, 95% RH for the Auxiliary Building Special Ventilation System.

C. Fans shall operate within ± 10% of design flow when tested.

d. If the internal pressure of the reactor containment vessel exceeds 2 psi, the condition shall be corrected within 8 hours or the reactor shall be placed in a subcritical condition. |

e. The reactor shall not be taken above the COLD SHUTDOWN condition unless the containment ambient temperature is > 40°F. |

BASIS

Containment System (TS 3.6)

Containment System Integrity (TS 3.6.a)

The COLD SHUTDOWN condition precludes any energy releases or buildup of containment pressure from flashing of reactor coolant in the event of a system break. The restriction to fuel that has been irradiated during power operation allows initial testing with an open containment when negligible activity exists. The shutdown margin for the COLD SHUTDOWN condition assures subcriticality with the vessel closed even if the most reactive RCC assembly were inadvertently withdrawn. Therefore, the two parts of TS 3.6.a allow CONTAINMENT SYSTEM INTEGRITY to be violated when a fission product inventory is present only under circumstances that preclude both criticality and release of stored energy.

When the reactor vessel head is removed with the CONTAINMENT SYSTEM INTEGRITY violated, the reactor must not only be in the COLD SHUTDOWN condition, but also in the REFUELING shutdown condition. A 5% shutdown margin is specified for REFUELING conditions to prevent the occurrence of criticality under any circumstances, even when fuel is being moved during REFUELING operations.

This specification also prevents positive insertion of reactivity whenever Containment System integrity is not maintained if such addition would violate the respective shutdown margins. Effectively, the boron concentration must be maintained at a predicted concentration of 2,100 ppm[(1)] or more if the Containment System is to be disabled with the reactor pressure vessel open.

Containment Isolation Valves (TS 3.6.b)

Containment isolation valves form a part of the containment boundary. The containment isolation valves' safety function is related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during a DBA.

To be considered OPERABLE, automatic containment isolation valves are required to close within prescribed time limits and to actuate on an automatic isolation signal. Check valves are considered OPERABLE when they have satisfactorily completed their required surveillance testing. Manual isolation components are considered OPERABLE when manual valves are closed, blind flanges are in place, and closed systems are intact.

Penetration flow path(s) may be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in

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[(1)]USAR Table 3.2-1

continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Specification TS 3.6.b.2 pertains to inoperable valves described in TS 3.6.b.3, manual valves assumed to be closed, and normally closed valves that are not assumed, by the USAR, to automatically close. This allows opening of containment isolation valves without entering the LCO or to open containment isolation valves closed as required by TS, provided the administrative controls are in place to ensure valve closure, if needed.

For these LCO(s), separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable containment isolation valve. Complying with the Required Actions may allow for continued operation, and subsequent inoperable containment isolation valves are governed by subsequent Condition entry and application of associated Required Actions.

In the event a containment isolation valve in one or more penetration flow paths is inoperable, the affected penetration flow path must be isolated within the specified time constraints. 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 1) a closed and de-activated automatic containment isolation valve, 2) a closed manual valve, 3) a blind flange, and 4) a check valve with flow through the valve secured. For a penetration flow path isolated, the device used to isolate the penetration should be the closest available one to containment. The 24-hour completion time is reasonable, considering the time required to isolate the penetration, perform maintenance, and the relative importance of supporting containment OPERABILITY.

For affected containment penetration flow paths that cannot be restored to OPERABLE status within the required completion time and that have been isolated, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure containment penetrations, requiring isolation following an accident and no longer capable of being automatically isolated, will be in that isolated position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. For the isolation devices inside containment, the time period is specified as "prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days." This is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

With two containment isolation valves in one or more penetration flow paths inoperable, the affected penetration flow path must be isolated within 1 hour. 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, and a blind flange. The 1-hour Completion Time is consistent with the ACTIONS of LCO 3.0.c. In the event the affected penetration is isolated, the affected penetration must be verified to be isolated on a periodic basis which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of "once per 31 days for verifying each affected penetration flow path is isolated" is appropriate considering the fact that the valves are operated under administrative control and the probability of their misalignment is low.

For those penetrations where one of the isolation devices is a closed system, either inside containment or outside containment, a longer outage time is allowed. This condition is only applicable to those penetration flow paths with a single containment isolation valve and a closed system. This longer outage time is due to a closed system subjected to leakage testing, missile protected, and seismic category I piping. Also, a closed system typically has flow through it during normal operation such that any loss of integrity could be observed through leakage detection system inside containment and system walkdowns outside containment. Thus, a 72-hour completion time is considered appropriate given that certain valves may be located inside containment and the reliability of the closed system.

Isolation devices located in high radiation areas shall be verified closed by use of administrative means. 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 to be in the proper position is small.

De-activation of an automatic containment isolation valve is accomplished by removing or interrupting the valves motive force, thus, preventing a change in the valve position by a single active failure. De-activation may be accomplished by opening the supply breaker for a motor operated valve, isolating air to an air operated valve, removing the supply fuse for a solenoid operated valve, or any other means for ensuring the isolation barrier cannot be affected by a single active failure.

Ventilation Systems (TS 3.6.c)

Proper functioning of the Shield Building Ventilation System is essential to the performance of the Containment System. Therefore, except for reasonable periods of maintenance outage for one redundant train of equipment, the complete system should be in readiness whenever CONTAINMENT SYSTEM INTEGRITY is required. Proper functioning of the Auxiliary Building Special Ventilation System is similarly necessary to preclude possible unfiltered leakage through penetrations that enter the Special Ventilation Zone (Zone SV).

Both the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System are designed to automatically start following a safety injection signal. Each of the two trains of both systems has 100% capacity. If one train of either system is found to be inoperable, there is not an immediate threat to the containment system performance and reactor operation may continue while repairs are being made. If both trains of either system are inoperable, the plant will be brought to a condition where the air purification system would not be required.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential radioiodine release to the atmosphere. Bypass leakage for the charcoal adsorbers and particulate removal efficiency for HEPA filters are determined by halogenated hydrocarbon and DOP respectively. The laboratory carbon sample test results indicate a radioactive methyl iodine removal efficiency under test conditions which are more severe than accident conditions.

Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers. The performance criteria for the safeguard ventilation fans are stated in Section 5.5 and 9.6 of the USAR. If the performances are as specified, the calculated doses would be less than the guidelines stated in 10 CFR Part 100 for the accidents analyzed.

In-place testing procedures will be established utilizing applicable sections of ANSI N510 - 1975 standard as a procedural guideline only.

Containment Pressure (TS 3.6.d)

The 2 psi limit on internal pressure provides adequate margin between the maximum internal pressure of 46 psig and the peak accident pressure resulting from the postulated Design Basis Accident as discussed in Sections 14.2 and 14.3 of the USAR.[2]

The reactor containment vessel is designed for 0.8 psi internal vacuum, the occurrence of which will be prevented by redundant vacuum breaker systems.

Containment Temperature (TS 3.6.e)

The requirement of a 40°F minimum containment ambient temperature is to assure that the minimum containment vessel metal temperature is well above NDTT + 30° criterion for the shell material.

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[2] USAR Section 5

d. Auxiliary Building Special Ventilation System

1. Periodic tests of the Auxiliary Building Special Ventilation System, including the door interlocks, shall be performed in accordance with TS 4.4.c.1 through TS 4.4.c.3, except for TS 4.4.c.2.d.

2. Each train of Auxiliary Building Special Ventilation System shall be operated with the heaters on at least 15 minutes every month.

3. Each system shall be determined to be operable at the time of periodic test if it starts with coincident isolation of the normal ventilation ducts and produces a measurable vacuum throughout the special ventilation zone with respect to the outside atmosphere.

e. Containment Vacuum Breaker System

The power-operated valve in each vent line shall be tested during each refueling outage to demonstrate that a simulated containment vacuum of 0.5 psig will open the valve and a simulated accident signal will close the valve. The check and butterfly valves will be leak tested in accordance with TS 4.4.b during each refueling, except that the pressure will be applied in a direction opposite to that which would occur post-LOCA.

f. Containment Isolation Device Position Verification

1. When the reactor is critical, verify each 36 inch containment purge and vent isolation valve is sealed closed every 31 days.

2. When the reactor is critical, verify each 2 inch containment vent isolation valve is closed every 31 days, except when the 2 inch containment vent isolation valves are open for pressure control, ALARA, or air quality considerations for personnel entry, or Surveillances that require the valves to be open.

3. Containment isolation manual valves and blind flanges shall be verified closed as specified in TS 4.4.f.3.a and TS 4.4.f.3.b, except as allowed by TS 4.4.f.3.c.

   a. When greater than COLD SHUTDOWN, verify each containment isolation manual valve and blind flange that is located outside containment and required to be closed during accident conditions is closed every 31 days, except for containment isolation valves that are locked, sealed, or otherwise secured closed or open as allowed by TS 3.6.b.2.

b. Prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN, if not performed in the previous 92 days, verify each containment isolation manual valve and blind flange that is located inside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are locked sealed or otherwise secured closed or open as allowed by TS 3.6.b.2.

c. Valves and blind flanges in high radiation areas may be verified by use of administrative means.

BASIS

Background - Containment Tests (TS 4.4)

The Containment System is designed to provide protection for the public from the consequences of a Design Basis Accident.[1] The Design Basis Accident is an instantaneous double-ended rupture of the cold leg of the Reactor Coolant System. Pressure and temperature behavior subsequent to the accident was determined by calculations evaluating the combined influence of the energy sources, the heat sinks and engineered safety features. The assumptions and effects for containment vessel leakage rate are detailed in the USAR[2] and further amplified in one of its Appendices.[3]

The total containment system consists of two systems. The Primary Containment System consists of a steel structure and its associated engineered safety features systems. The Primary Containment System, also referred to as the Reactor Containment Vessel, is a low-leakage steel shell, including all of its penetrations, designed to confine the radioactive materials that could be released by accidental loss of integrity of the Reactor Coolant System pressure boundary. It is designed for a maximum internal/test pressure of 46 psig and a temperature of 268°F.

The Secondary Containment System consists of the Shield Building, its associated engineered safety features systems, and a Special Ventilation Zone in the Auxiliary Building. The Shield Building is a medium-leakage concrete structure surrounding the Reactor Containment Vessel and is designed to provide a means for collection and filtration of fission-product leakage from the Reactor Containment Vessel following the Design Basis Accident. A 5-ft. annular space is provided between the Reactor Containment Vessel and the Shield Building. The Shield Building Ventilation System is the engineered safety feature utilized for the collection and filtration of fission-product leakage from the containment vessel.

The Special Ventilation Zone of the Auxiliary Building provides a medium-leakage boundary which confines leakage that could conceivably bypass the Shield Building annulus. The safety system associated with the Auxiliary Building Special Ventilation Zone is the Auxiliary Building Special Ventilation System (ABSVS). One of the functions of the ABSVS is to collect and filter any potential fission products that may bypass the Shield Building annulus.

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[1] USAR Section 14.3

[2] USAR Section 14.3.5

[3] USAR Appendix H

Auxiliary Building Special Ventilation System (TS 4.4.d)

Demonstration of the automatic initiation capability is necessary to assure system performance capability.[5]

Periodic checking of the inlet heaters and associated controls for each train will provide assurance that the system has the capability of reducing inlet air humidity so that charcoal adsorber efficiency is enhanced.

In-place testing procedures will be established utilizing applicable sections of ANSI N510-1975 standard as a procedural guideline.

Vacuum Breaker Valves (TS 4.4.e)

The vacuum breaker valves are 18 inch butterfly valves with air to open, spring to close operators. The valve discs are center pivot and rotate when closing to an EPT base material seat. When closed, the disc is positioned fully on the seat regardless of flow or pressure direction. Testing these valves in a direction opposite to that which would occur post-LOCA verifies leakage rates of both the vacuum breaker valves and the check valves downstream.

Isolation Device Positions (TS 4.4.f)

TS 4.4.f.1 ensures each 36 inch containment purge valve is verified sealed closed at 31-day intervals.[6] This Surveillance is designed to ensure that an inadvertent or spurious opening of a containment purge valve does not cause a gross breach of containment. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit off-site doses. Therefore, these valves are required to be in the sealed closed position when critical. A containment purge valve that is sealed closed must be closed with its control switch sealed in the close position. In this application, the term "sealed" has no connotation of leak tightness. The frequency is a result of a NRC initiative, Generic Issue B-24, related to containment purge valve use during plant operations.

TS 4.4.f.2 ensures the 2-inch vent/purge valves are closed as required or, if open, open for an allowable reason. If a 2-inch vent/purge valve is open in violation of this TS, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The TS is not required to be met when the 2-inch vent/purge valves are open for the reasons stated. The valves may be opened for pressure control, ALARA, or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The 2-inch vent/purge valves are capable of closing in the environment following a

[5] USAR Section 9.6

[6] Letter from Steven A. Varga (NRC) to C.W. Giesler (WPSC) dated April 22, 1983

LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day frequency is consistent with other containment isolation valve requirements discussed.

TS 4.4.f.3.A requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed. The TS helps to ensure that post-accident leakage of radioactive fluids or gases outside of the containment boundary are within design limits. This TS does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The TS specifies that containment isolation valves that are open under administrative controls are not required to meet the TS during the time the valves are open. This TS does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

TS 4.4.f.3.B requires verification that each containment isolation manual valve and blind flange located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions, is closed. The TS helps to ensure that post-accident leakage of radioactive fluids or gases outside of the containment boundary is within design limits. For containment isolation valves inside containment, the frequency of "prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days" is appropriate since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. The TS specifies that containment isolation valves that are open under administrative controls are not required to meet the TS during the time they are open. This TS does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

TS 4.4.f.3.C modifies TS 4.4.f.3 for valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted when above COLD SHUTDOWN for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

ATTACHMENT 4

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

March 7, 2001

Proposed Amendment 165a

NRC Staff Request for Additional Information

and

Nuclear Management Company, LLC, Responses

1.0 Definitions

1.0-1_ CTS 1.0.g
CTS 3.6.a, and 3.6.b
TS 3.6.a.1, 3.6.a.2, 3.6.b, 3.6.c, and 3.6.d

The markup of the Current Technical Specifications (CTS) shows that CTS 1.0.g "CONTAINMENT SYSTEM INTEGRITY": is deleted and that the phrase "CONTAINMENT SYSTEM INTEGRITY" in CTS 3.6.a and 3.6.b is changed to "Containment System Integrity" in the corresponding renumbered Technical Specification (TS) 3.6.a.1 and 3.6.d respectively. Furthermore, the new TS 3.6.a.2, 3.6.b, and 3.6.c uses the new terminology or phrase "When Containment System Integrity is required." The justifications provided for the deletion of CTS 1.0.g is that CTS 1.0.g.1, 1.0.g.2, 1.0.g.3, and 1.0.g.4 are incorporated by the new TS 3.6.a.2, 3.6.b and 3.6.c. No specific justification is provided for the deletion of CTS 1.0.g.5 or 1.0.g.6; although it can be implied from the other justifications that these two items are incorporated by CTS 4.4 and CTS 3.6.b (new TS 3.6.d) respectively, and a general justification statement that the changes are consistent with NUREG - 1431, "Standard Technical Specifications (STS) Westinghouse Plants." While the staff finds the justifications for adding TS 3.6.a.2, 3.6.b and 3.6.c as related to CTS 1.0.g is acceptable, it finds the overall change with regards to the definition deletion unacceptable. The staff acknowledges that NUREG - 1431 does not include in STS 1.0 a definition for "CONTAINMENT SYSTEM INTEGRITY" or "CONTAINMENT INTEGRITY." However, in the development of NUREG - 1431 from NUREG - 0542, the old W-STS, the definition of "CONTAINMENT INTEGRITY" was relocated in STS entirety from the Definition Section (1.0) to the Bases for Containment (STS B3.6.1 Bases - BACKGROUND), and is used to define what constitutes an OPERABLE containment. Furthermore, the requirements in the definition with regards to containment airlocks and containment isolation valves are also relocated to their respective Bases and used to define what constitutes an OPERABLE airlock and containment isolation valve. In addition the use of the phrases "Containment System Integrity shall not be violated..." or "Whenever/when Containment System Integrity is required..." is meaningless, since the term "Containment System Integrity" is not defined anywhere nor explained. **Comment:** Either retain the definition CTS 1.0.g "CONTAINMENT SYSTEM INTEGRITY" in CTS 1.0 or revise the "Basis" to define "Containment System Integrity," or what constitutes an OPERABLE containment, containment airlock, and containment isolation valve, and to be in conformance with the intent of NUREG - 1431, revise the LCOs in TS 3.6 to reflect the requirement that the containment is OPERABLE. Provide appropriate discussions and justifications for this change.

NMC Response:

NMC agrees. During our review of the Standard Technical Specification (STS) the definition section was the only section reviewed for a definition of "Containment Integrity." As this definition exists in the basis section of STS the current KNPP TS definition will be maintained in the definition section. This will maintain a definition of "Containment System Integrity," and avoid operator confusion by maintaining this definition in an already familiar location.

3.6 Containment Systems

3.6.0-1 CTS 3.0.c
CTS 3.6
TS 3.6

The staff has reviewed the justifications provided for the changes in CTS 3.6, and finds that they are incomplete and unacceptable. The basic justification is that the changes are consistent with NUREG - 1431 Rev. 1. Consistency with the NUREG or standard is not a basis for acceptability. Based on the wording of the CTS, an inoperability of a containment system (containment, airlocks, equipment hatches, isolation valves, etc.) would require an immediate shutdown of the plant. Under the proposed TS this immediate shutdown is delayed for a period of time depending on the action and/or the inoperable component(s). In some cases the change is More Restrictive than the CTS requirements, while in others it is Less Restrictive. These changes need to be justified for Kewaunee. **Comment:** Except for the justification associated with the 24 hour allowed outage time (AOT) for containment isolation valves, provide additional discussion and justification for the propose TS changes. The 24 hour AOT for containment isolation valves is considered by the staff as a generic change and is being reviewed independent of this review.

NMC Response:

NMC will resubmit the license amendment request. In this re-submittal each change to the TS will be justified individually.

3.6.a Containment

3.6.a-1 CTS 3.0.c
TS 3.6.a.1
TS 3.6.a.2

Based on the wording and structure of TS 3.6.a.2, it seems that TS 3.6.a.2 specifies the OPERABILITY and remedial actions for the reactor containment vessel and shield building equipment hatches only. It is unclear based on the justifications that state that the changes are consistent with NUREG - 1431, if the actions specified in TS 3.6.a.2.A are also supposed to apply to an inoperable reactor containment vessel or shield building. If the actions associated with TS 3.6.a.2.A are to apply to an inoperable reactor containment vessel or shield building, then TS 3.6.a.2.A needs to be revised. If not, do the actions associated with TS 3.6.a.1, i.e., CTS 3.0.c, apply? NUREG - 1431 does not contain a specific Action for inoperable equipment hatches, the Action for an inoperable equipment hatch is encompassed by the overall containment or shield building Actions for an inoperable containment (STS 3.6.1) or shield building (STS 3.6.19). In light of the discussion and request associated with RAI 1.0-1, it would seem that TS 3.6.a.2 is unnecessary. See RAI 3.6.a.2. **Comment:** Provide additional discussion and justification for this change. Revise the TS as appropriate. See RAIs 1.0-1 and 3.6.a-2.

NMC Response:

NMC agrees that TS 3.6.a.2 is unnecessary. In NMC's responds to question 1.0-1 above we stated that the definition of "Containment System Integrity" would be maintained in the definition section. Maintaining this definition removes the need to include individual TS Limiting Conditions of Operability (LCO) for the containment and shield building equipment hatches. These conditions will be in the definition of "Containment System Integrity." Therefore, no change in the TS associated with the equipment hatches is requested.

3.6.a-2 CTS 1.0.g.2 and 1.0.g.6
CTS 3.6.a and 3.6.b.1
TS 3.6.a.1, 3.6.a.2, and 3.6.d.1
STS 3.6.19 and Associated Bases

Based on the wording of CTS 1.0.g.2, 1.0.g.6, 3.6.a, and 3.6.b.1 and TS 3.6.a.1, 3.6.a.2 and 3.6.d.1, it would seem that ACTIONS for an inoperable shield building would be those ACTIONS associated with an inoperable containment. NUREG - 1431 in STS 3.6.19 provides specific ACTIONS inoperable shield building and its associated equipment hatch/access openings which are less stringent than the ACTIONS associated with containment: Provide a discussion and justification as to why these less stringent requirements were not used for shield building inoperability and/or shield building equipment hatch inoperability in TS 3.6.a.2.A.

NMC Response:

As per discussions above, these TS change will not be resubmitted. Therefore no change is requested and no justification required.

3.6.b Containment Air Locks

3.6.b-1 TS 3.6.b.2, 3.6.b.3, and Associated Basis
STS 3.6.2 ACTIONS and Associated Bases

The staff has reviewed the proposed remedial actions associated with an inoperable airlock(s), and finds that these proposed actions are not consistent with or meet the intent of the actions specified in STS 3.6.2 ACTIONS and its associated Bases. See RAIs 3.6.b-2, 3.6.b-3, 3.6.b-4, 3.6.b-5, 3.6.b.-7, 3.6.b-8, and 3.6.b-9 for specific concerns with regards to TS 3.6.b.2, 3.6.b.3 and their associated Bases. **Comment:** Revise TS 3.6.b.2, 3.6.b.3 and their associated Bases to bring them into conformance with STS 3.6.2

ACTIONS and its associated Bases. See RAIs 3.6.b-2, 3.6.b-3, 3.6.b-4, 3.6.b-5, 3.6.b-7, 3.6.b-8, and 3.6.b-9.

NMC Response:

As KNPP TS will be retaining the current definition TS 1.0.g, "Containment System Integrity," the TS change request for containment air locks, as described above, will not be submitted. Therefore the answers associated with RAIs 3.6.b-2, 3.6.b-3, 3.6.b-4, 3.6.b-5, 3.6.b-6, 3.6.b-7, 3.6.b-8, and 3.6.b-9 is no longer necessary and will reference the answer to this question.

3.6.b-2 TS 3.6.b.2.A and 3.6.b.2.B
STS 3.6.2 ACTION Note 2, ACTIONS A and B, and Associated Bases

TS 3.6.b.2.A and 3.6.b.2.B specify the remedial actions to be taken for an inoperable airlock door and an inoperable interlock mechanism. The introductory statements – "Both air locks may have one inoperable door if:" and "Both air locks may have an inoperable interlock mechanism if:" - conflict with the balance of the ACTION statements. These statements would only allow one air lock door or one interlock mechanism to be inoperable. However, the balance of the ACTIONS in TS 3.6.b.2.A.1, 3.6.b.2.A.2, 3.6.b.2.B.1 and 3.6.b.2.B.2 seen to imply that one could have one door in each airlock or both interlocks in both airlocks inoperable at the same time, which is consistent with the intent of the STS. In the STS the combination of STS 3.6.2 ACTION Note 2 and the wording of STS 3.6.2 CONDITIONS A and B allows for both air locks to have an inoperable door and how the actions are applied if more than one component is inoperable. Furthermore, in the TS as proposed, an inoperable door and an inoperable interlock mechanism would result in entry into TS 3.6.b.2.C, which is not the intent of the STS ACTIONS. **Comment:** Revise the introductory statements to TS 3.6.b.2.A and 3.6.b.2.B to be consistent with the wording associated with STS 3.6.2 ACTION Note 1 and Conditions A and B.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-3 TS 3.6.b.2.A.2 and 3.6.b.2.B.2
STS 3.6.2 Required Action (RA) A.2, A.3, B.2, and B.3

Proposed TS 3.6.2.A.2 and 3.6.b.2.B.2 specifies that after the OPERABLE airlock door is verified closed in the affected airlock, "The OPERABLE door(s) is administratively controlled closed." The terminology "administratively controlled closed" is undefined, and is not consistent with or meets the intent of the STS which specified in STS 3.6.2 RA A.2 and B.2 that the OPERABLE door(s) be locked closed. The basis for locking the door is that there is a low likelihood of a locked door being in misposition which would not be the case if it were just administratively controlled closed. In addition, in order to allow continued operation the STS specifies in STS 3.6.2 RA A.3 and B.3 that the locked doors be verified locked closed on a 31 day frequency to assure that an acceptable containment leakage boundary is maintained. The proposed TS does not contain this requirement. See RAI 3.6.b-8 for an additional concern in this area. **Comment:** Revise TS 3.6.b.2.A.2 and 3.6.b.2.B.2 to be consistent with the wording of STS 3.6.2 RA A.2 and B.2 respectively. Also, revise the submittal to add the requirements of STS 3.6.2 RA A.3 and B.3. Provide appropriate discussions and justifications for these changes. See RAI 3.6.b-8.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-4 TS 3.6.b.2.A.2
STS 3.6.2 ACTION Note 1, RA A Note 2, and Associated Bases.

TS 3.6.b.2.A.2 allows the OPERABLE door to be opened for entry and exit to repair the inoperable air lock component. This corresponds to STS 3.6.2 ACTION Note 1. See RAI 3.6.b-7 for additional concerns in this area. However, STS 3.6.2 RA A restricts this entry and exit if both airlocks are inoperable. This Note is needed to facilitate containment entry and exit to perform other TS surveillances, ACTIONS and/or repairs and is also necessary if repairs to the inoperable air lock doors must be made from inside containment. TS 3.6.b.2.A.2 as currently written would have an indefinite time limit. This is unacceptable. **Comment:** Revise TS 3.6.b.2.A.2 and associated Basis to more accurately reflect the Notes associated with STS 3.6.2 RA A. Provide any necessary discussion and justifications associated with this change. See RAI 3.6.b-7.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-5 TS 3.6.b.3
STS 3.6.2 ACTION D

TS 3.6.b.3 states that if "...the OPERABILITY requirements of TS 3.6.b.2 are not met within the times specified, then within 1 hour initiate action to:" shutdown the plant within a certain time period. This is not consistent with the STS. In the STS if the Required Actions and associated Completion Times are not met, an immediate shutdown is started. One is not given an additional hour to prepare for a shutdown. It is assumed that sufficient time has been provided for in the previous Required Actions to either correct the problem or prepare for a shutdown. **Comment:** Revise proposed TS 3.6.b.3 and its associated Basis to delete the 1 hour time requirement to initiate action.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-6 CTS 4.4
TS 3.6.b.2.B
STS SR 3.6.2.1, SR 3.6.2.2 and Associated Bases

STS 3.6.2 has two Surveillance Requirements (SR) associated with it. SR 3.6.2.1 which addresses airlock leakage and SR 3.6.2.2 which deals with the operability of the interlock mechanism. The corresponding CTS SR for STS SR 3.6.2.1 is CTS 4.4. However, the proposed amendment does not propose a corresponding SR for SR 3.6.2.2 even though they do propose an ACTION for an inoperable airlock interlock mechanism. **Comment:** Revise the proposed amendment to provide a SR that corresponds to STS SR 3.6.2.2 and its associated Bases as modified by TSTF-17 Rev. 1. Provide the necessary discussions and justifications for this change.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-7 TS 3.6.b.2.A.2, 3.6.b.2.B.2 and Basis for 3.6.b
STS 3.6.2 ACTION Note 1 RA A Note 2, RA B Note 2 and Associated Bases

The first and third paragraphs of the Basis for TS 3.6.b provide a discussion on the exception to open the OPERABLE door(s) in an inoperable airlock. The discussion is based on, and uses the words in the Basis discussion in STS B3.6.2 for ACTION Note 1 and RA B Note 2. While the Basis discussion for TS 3.6.b.2.B.2 is acceptable, the Basis discussion associated with TS 3.6.b.2.A.2 is incomplete. See RAI 3.6.b-4 for one concern with STS RA A Note 2 and its associated Bases with regards to TS 3.6.b.A.2. The Bases for TS 3.6.b.2.A.2 uses virtually word- for- word the last half of the STS Bases descriptive paragraph for STS 3.6.2 ACTION Note 1 to describe this exception. The first part of this STS paragraph which provides a description of the preferred methods for air lock repair entry and exit is not used. The staff believes this is important information on how this Note is to be applied and therefore needs to be included in the Basis discussion. In addition, the second to last sentence in the Basis for TS 3.6.b.2.A.2 states the following: "After each entry and exit, the OPERABLE door must be closed." The STS wording is "must be immediately closed." The deletion of the word "immediately" is significant, in that it describes the time period associated with door closure. The proposed TS does not. **Comment:** Revise the Basis discussion for TS 3.6.b.2.A.2 to accurately reflect the Bases discussion for STS B3.6.2 ACTION Note 1. See RAI 3.6.b-4.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-8 TS 3.6.b.2 and Associated Basis
STS 3.6.2 RA A.3 Note, RA B.3 Note and Associated Bases

The second paragraph in the Bases for TS 3.6.b describes the verification of air lock door closure in high radiation areas. The proposed TS 3.6.b.2 does not contain an allowance to allow verification that the air lock door is locked closed by use of administrative controls or remote indications. Resolution of RAI 3.6.b-3 will address verification in high radiation areas. However, verification of the door being locked closed by administrative controls or remote indication is unacceptable. As stated in RAI 3.6.b-3 closure by administrative controls is unacceptable. In addition, the staff does not know how an air lock door can be verified locked closed by remote indications. **Comment:** Revise the paragraph to reflect the STS wording. See RAI 3.6.b-3.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.b-9 TS 3.6.b.2, 3.6.b.3 and Associated Basis

The Basis for TS 3.6.b provides a discussion on the purpose of the ACTIONS, and a justification for the AOTs, and the shutdown times associated with TS 3.6.b.2.C and 3.6.b.3. However, no discussion or justification except for the air lock door opening exceptions is provided on the purpose of the ACTIONS and for the AOTs associated with TS 3.6.b.2.A and 3.6.b.2.B. **Comment:** Revise the Bases for TS 3.6.b to include a discussion on the purpose and justification for the AOTs associated with TS 3.6.b.2.A and 3.6.b.2.B.

NMC Response:

NMC response is no longer necessary, reference answer to RAI question 3.6.b-1.

3.6.c Containment Isolation Valves

3.6.c-1 TS 3.6.c.2, 3.6.c.3 and Associated Basis
STS 3.6.3 ACTIONS and Associated Bases

The staff has reviewed the proposed remedial actions associated with inoperable containment isolation valves (CIV), and finds that the proposed actions are not consistent with or meet the intent of the ACTIONS specified in STS 3.6.3 ACTIONS and its associated Bases. See RAI 3.6.c-2, 3.6.c-3, 3.6.c-4, 3.6.c-5, 3.b.c-6, 3.6.c-8 and 3.6.c-9 for specific concerns with regards to TS 3.6.c.2, 3.6.c.3 and their associated Basis. **Comment:** Revise TS 3.6.c.2, 3.6.c.3 and their associated Basis to bring them into conformance with STS 3.6.3 ACTIONS and its associated Basis. See RAI 3.3.6.c-2, 3.6.c-3, 3.6.c-4, 3.6.c-5, 3.6.c-6, 3.6.c-8 and 3.6.c-9.

NMC Response:

Due to changes from the original license amendment request dated January 13, 2000 associated with retaining KNPP's current definition of, "Containment System Integrity," the TS numbering associated with these TS has also changed. The containment air lock section of the TS will not be submitted. Therefore the original TS submittal section 3.6.c will be numbered section 3.6.b in this submittal. See RAI questions 3.3.6.c-2, 3.6.c-3, 3.6.c-4, 3.6.c-5, 3.6.c-6, 3.6.c-8 and 3.6.c-9 for the specific responses and TS section 3.6.b for the changes.

3.6.c-2 CTS 3.0.c
TS 3.6.c.2.A, 3.6.c.2.B and Associated Basis
STS 3.6.3 ACTION Note 2, ACTIONS A and B, and Associated Bases

TS 3.6.c.2.A and 3.6.c.2.B specify the remedial actions to be taken for one or two inoperable CIVs in a penetration. The introductory statements – "With one containment isolation valve in a penetration inoperable:" and "With two containment isolation valves in a penetration inoperable:" - conflict with the balance of the ACTION statements and the Basis discussion. These statements would only allow one penetration to be inoperable at a time. However, the balance of the ACTION in TS 3.6.c.2.A and the associated Basis discussion seem to imply that one could have more than one penetration inoperable at the same time, which is consistent with the intent of the STS. In the STS the combination of STS 3.6.3 ACTION Note 2 and the wording of STS 3.6.3 CONDITIONS A and B allows for more than one penetration to be inoperable. In the TS as proposed, more than one inoperable penetration could result in entry into CTS 3.0.c which is not the intent of the STS ACTIONS. **Comment:** Revise the introductory statements to TS 3.6.c.2.A and 3.6.c.2.B to be consistent with the wording associated with STS 3.6.3 ACTION Note 1, and CONDITIONS A and B.

NMC Response:

Agree. NMC will revise the introductory statements to TS 3.6.c.2.A and 3.6.c.2.B to be consistent with the wording associated with STS 3.6.3 ACTION Note 1, and CONDITIONS A and B. Specifically the statement, "With one or more penetration flowpaths". . . will be added to the beginning of each of these statements and, "in a penetration" will be removed to state that more than one penetration may be inoperable at the same time.

3.6.c-3 TS 3.6.c.A.1
STS 3.6.3 ACTION C and Associated Bases

TS 3.6.c.2.A.1 requires that a penetration with an inoperable CIV be isolated with 24 hours using one of a number of isolation devices, one of which may be a check valve with the flow through the valve secured. TS 3.6.c.2.A.1 also contains an exception with regards to the check valve which states that "A check valve shall not be used for flow path isolation if the affected penetration has only one containment isolation valve." The staff has two problems with this statement. In the STS the corresponding ACTION with regards to penetrations with one CIV is STS 3.6.3 ACTION C. In NUREG-1431 ACTION C applies to penetrations with only one CIV and a closed system. The staff cannot determine if the penetrations at Kewaunee with only one CIV are in closed systems (10 CFR 50 Appendix A GDC 57) or open systems. If all these penetrations are in closed systems, then the ACTION is acceptable including the 24 hour AOT. Since TSTF-30 modified the Completion Time in STS 3.6.3 ACTION C from 4 hours to 72 hours for this situation, the 24 hour AOT is acceptable for these penetrations only. The only change that would be needed would be to clarify that the penetration is in a closed system. However, if one or more of these penetrations are in an open system, then the 24 hour AOT is unacceptable. TSTF-30 Rev. 3 makes a distinction between penetrations with only one CIV in a closed system and an open system. The distinction is that for a closed system a 72 hour Completion Time is allowed for isolation while only 4 hours is allowed for isolation in an open system. These changes were made to NUREGs-1433 and 1434 (BWR/4 and BWR/6 respectively) since these types of systems were present in those designs. If this type of penetration/system design is present at Kewaunee then the AOT must be modified to reflect the various types of penetration/systems. Consideration should be given to providing a separation ACTION for these types of penetrations/systems to take advantage of the longer AOT. **Comment:** Revise TS 3.6.c.2.A.1 and associated Basis to reflect the above discussion with regards to STS 3.6.3 ACTION C as modified by TSTF-30 Rev. 3

NMC Response:

Agree. Kewaunee has 14 penetrations with a single containment isolation valve. See Table 1 for a listing of these penetrations. KNPP TS will be modified to incorporate these changes.

TSTF-30 Rev. 3 modifies STS 3.6.3 Action C. Included, as part of this modification is the addition of a reference in the basis section to the Standard Review Plane (SRP) section 6.2.4. The SRP defines what is required to be considered a closed system inside containment. The criteria for a closed system are:

SRP 6.2.4 – Containment Isolation System – Acceptance Criteria

1. The system does not communicate with either the reactor coolant system or the containment atmosphere.

2. The system is protected against missiles and pipe whip.

3. The system is designated seismic Category I

4. The system is classified Safety Class 2. (Regulatory Guide 1.141, "Containment Isolation Provisions for Fluid Systems")

5. The system is designed to withstand temperatures at least equal to the containment design temperature.

6. The system is designed to withstand the external pressure from the containment structure acceptance test.

7. The system is designed to withstand the loss-of-coolant accident transient and environment.

When Kewaunee was designed and built these design requirements did not exist. One system, Component Cooling (CC), has been evaluated as meeting the criteria for being designated a closed system per ANSI/ANS-56.2-1984, "Containment Isolation Provisions For Fluid Systems After A LOCA." The other systems have not been evaluated to meet ANSI/ANS 56.2-1984 or the SRP criteria for a closed system inside containment, although these systems are design to operate post-accident. Being designed to operate post-accident and not in communication with the Reactor Coolant System or containment atmosphere, these systems meet the criteria of closed system inside containment.

GENERAL DESIGN CRITERIA (GDC) 57 ALLOWS THE USE OF A CLOSED SYSTEM IN COMBINATION WITH A CONTAINMENT ISOLATION VALVE TABLE 1 PENETRATIONS WITH SINGLE ISOLATION VALVE					
Penetration		**Process**	**Closed Portion**	**Inside/Outside**	Class
1	6E	Main Steam Line A	Steam Generator	Inside	4A
2	6W	Main Steam Line B	Steam Generator	Inside	4A
3	10	RHR Loop I	RHR System	Outside	6
4	28N	Cold Leg SI	SI System	Outside	6
5	32N	CC from RxCP	CC System	Inside	6
6	32E				
7	33E	CC to RxCP	CC System	Inside	6
8	33N				
9	38NW	SW from Cntmt FCU's	SW System	Inside	6
10	38NE				
11	38ES				
12	38EN				
13	39	CC Return From Excess LD Heat Exchanger	CC System	Inside	4
14	40	CC To Excess LD Heat Exchanger	CC System	Inside	4

It can be seen from the above Table 1 that the penetration with a single isolation valve and a closed system are one of two classes. Either they are KNPP class 4 penetration or class 6 penetration.

Class 4 penetrations are considered missile protected and are normally operating incoming and outgoing lines that penetrate the Reactor Containment Vessel. They are connected to closed systems inside the Reactor Containment Vessel, which have a low probability of being ruptured by the assumed accident, and are provided with at least one remotely-operated valve located outside the Reactor Containment Vessel.

The steam line penetrations are considered class 4A penetrations. The isolation system for these penetrations are subject to special consideration on leakage and testing requirements because their principal function is related to rupture of steam generator secondary side systems and not loss of coolant.

Class 6 penetration is with systems required to operate in the post-accident condition. The design and operational criteria for the isolation valves in these systems is governed by the functional requirements of the systems as outlined in the USAR section in which the system is described.

The Service Water System is pressurized inside the containment, but the pressure at certain points downstream of the coils will be below the containment design pressure of 46 psig. However, since the fan coils and service water lines form a closed system inside the containment, no contaminated leakage is expected into these units. Should such an unlikely situation occur, the unit could be remotely isolated to prevent leakage.

The RHR and SI systems are considered closed systems outside containment. These systems are included in KNPP System Integrity Plan. The System Integrity Plan tests these systems under post-accident system pressures to quantify the leakage from the system ensuring the total leakage is less than that analyzed to maintain offsite dose post-accident within requirements.

Therefore, all penetration flowpaths with a single containment isolation valve have a closed system as the other isolation device. These closed systems are either inside or outside containment.

3.6.c-4 TS 3.6.c.2.A.2.b, 3.6.c.2.B.2.b and Associated Basis
STS 3.6.3 RA A.2

TS 3.6.c.2.A.2.b and 3.b.c.2.B.2.b specify that the affected penetration shall be verified to be isolated prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN for isolation devices inside containment. This is not consistent with the STS which requires the verification frequency for isolation device inside containment to be prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days. The frequency of "if not performed within the previous 92 days" has not been included. No justification is provided this omission, which could be considered to be a generic change. The frequency is needed to ensure that isolation device misalignment is an unlikely possibility. **Comment:** Revise TS 3.6.c.2.A.2.b, 3.6.c.2.b.2.b and the associated Basis to reflect the STS requirement to verify isolation prior to entering INTERMEDIATE SHUTDOWN from COLD SHUTDOWN if not performed within the previous 92 days.

NMC Response:

NMC agrees. These TS will be modified to include the statement, "if not performed within the previous 92 days."

3.6.c-5 TS 3.6.c.2.C
STS 3.6.3 ACTION Note 1, and Associated Bases

STS 3.6.3 ACTION Note 1 allows penetration flow paths to be unisolated intermittently under administrative controls. The associated Bases for STS 3.6.3 ACTION Note 1 describes what constitutes "under administrative controls." The proposed TS change combines STS 3.6.3 ACTION Note 1 and its associated Bases into TS 3.6.c.2.C. However, the proposed TS makes two changes which changes the intent of STS 3.6.3

ACTION Note 1. TS 3.6.c.2.C limited only to those flow paths with inoperable CIVs. The intent of the STS Note is to allow any closed CIV except certain purge valves to be opened under administrative controls and not restrict it to just those valves closed as a result of Required Actions. In addition, the Note prevents unnecessary entry into the ACTION statements when a normally closed valve is opened. The second change deletes the word "intermittently." By deleting this word, TS 3.6.c.2.C allows the closed valve to remain open indefinitely, which was not the intent of the STS Note. **Comment:** Revise TS 3.6.c.2.C to bring it into conformance with STS 3.6.3 ACTION Note 1 and its Associated Bases.

NMC Response:

Agree. TS 3.6.c.2.C is revised and relocated. New location of TS is TS 3.6.b.2.

3.6.c-6 TS 3.6.c.3
STS 3.6.2 ACTION D

TS 3.6.c.3 states that if "...the OPERABILITY requirements of TS 3.6.c.2 are not met within the times specified, then within 1 hour initiate action to:" shutdown the plant within a certain time period. This is not consistent with the STS. In the STS if the Required Actions and associated Completion Times are not met, an immediate shutdown is started. One is not given an additional hour to prepare for a shutdown. It is assumed that sufficient time has been provided for in the previous Required Actions to either correct the problem or prepare for a shutdown. **Comment:** Revise proposed TS 3.6.c.3 to delete the 1 hour time requirement to initiate action.

NMC Response:

Agree. 1-hour time requirement to initiate action is deleted.

3.6.c-7 CTS 1.0.g.1 and 1.0.g.4
TS 3.6.c.1
STS SR 3.6.3.1 through 3.6.3.11 and Associated Bases

STS 3.6.3 has a number of SRs associated with it to verify CIV OPERABILITY. The CTS through CTS 1.0.g describes what constitutes an OPERABLE CIV. The proposed TS specify that the CIVs be OPERABLE and provide proposed ACTIONS for inoperable CIVs, but do not propose corresponding SRs to verify CIV OPERABILITY. As a minimum the staff believes that STS SR 3.6.3.1 and/or 2, 3.6.3.3, 3.6.3.4, 3.6.3.5 and 3.6.3.8 should be in the proposed TS amendment. **Comment:** Revise the proposed amendment to provide the appropriate SRs to verify CIV OPERABILITY, or provide appropriate discussions and justifications as to why they should not be included.

NMC Response:

NMC reviewed the above listed SR additions for inclusion in KNPP TS. Disposition of the addition of the SR are as follows:

- **SR 3.6.3.1 and/or 2**: NMC added TS 4.4.f.1 and TS 4.4.f.2 to the KNPP TS to address these surveillance requirements. The requirement for verifying these valves sealed closed is modified from STS to require this verification only when critical. Per letter from the NRC[1], the NRC agreed that these valves only need to be sealed shut while above hot shutdown, therefore verifying these valves sealed closed while critical maintains the current licensing basis.
- **SR 3.6.3.3 and 4** NMC added these surveillance requirements to the KNPP TS. These SRs are KNPP TS 4.4.f.3.
- **SR 3.6.3.5 and 8** These SR are already included in KNPP TS. SR 3.6.5 is required by KNPP TS 4.2.a.2 that requires these valves to be included in the KNPP Inservice Testing Program. SR 3.6.3.8 is KNPP TS 4.1.b that refers to TS Table 4.1-3 which requires a Containment Isolation Trip test.

3.6.c-8 TS 3.6.c.2 and Associated Basis
STS 3.6.3 RA A.2 Note, RA C.2 Note and Associated Bases

The third paragraph in the Basis for TS 3.6.c describes the verification of isolation device closure in high radiation areas. The proposed TS 3.6.c.2 does not contain an allowance to allow verification that the penetration is closed/isolated by use of administrative means. **Comment:** Revise TS 3.b.c.2 to allow penetrations in high radiation areas to be verified isolated by administrative means. Provide the necessary discussions and justification for this change.

NMC Response:

Agree. This addition will be made to the TS amendment request with associated justification provided.

3.6.c-9 TS 3.6.c.2, 3.6.c.3 and Associated Basis

The Basis for TS 3.6.c provides a discussion on the purpose the ACTION and a justification for the AOTs for TS 3.6.c.2.A. However, no discussion or justification is provided on the purpose of the ACTIONS and Notes and for the AOTs associated with TS 3.6.c.2.B, 3.6.c.2.C, and 3.6.c.3. **Comment:** Revise the Basis for TS 3.6.c to include a discussion on the purpose of the ACTIONS and justification for the AOTs associated with TS 3.6.c.2.B, 3.6.c.2.C and 3.6.c.3.

NMC Response:

The basis section will be revised to include a discussion on the purpose of the ACTIONS and justification for the AOTs associated with TS 3.6.b.2.B, 3.6.b.2.C and 3.6.b.3. Note that as the TS request for the containment air locks is no longer required the TS section has changed for section 3.6.c to 3.6.b.

Additional Questions

1. What is the algorithm for LERF, ICLERP?

NMC Response:

LERF = (Early Bypass) + [CDF(Non Bypass) * CIL]

(Early Bypass) = core damage frequency due to early containment bypass sequences. These sequences are assumed to result in both core damage and large early release

Early containment bypass sequences are defined as all interfacing systems LOCAs that are not isolated and all steam generator tube ruptures that result in core damage within 4 hours of the initiator.

CDF(Non Bypass) = core damage frequency due to non containment bypass sequences.

Non containment bypass sequences are defined as all isolated interfacing systems LOCAs and all other sequences except for steam generator tube ruptures.

CIL = Containment Isolation for LERF.

Containment isolation for LERF is defined as failure of any penetration greater than 5" except for those that do not meet Criterion 1 or (2A and 2B) as discussed in the submittal.

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2. Does Criterion 1 or do all of the Criterion 2A and 2B cover the following penetration flow paths:

- CIVs in penetrations connected to safety injection line check valve leakage path
- CIVs in penetrations connected to the reactor coolant system sample line
- CIVs in penetrations connected to letdown or reactor coolant pump bleedoff line
- CIVs in penetrations connected to non-essential containment cooling
- CIVs in penetrations used to support RCS inventory control safety function under accident condition

- CIVs in penetrations used to support containment heat removal function using containment sprays
- CIVs in penetrations used to support containment heat removal function using fan coolers

NMC Response:

- CIVs in penetrations connected to safety injection line check valve leakage path

Yes, this penetration is included in the model.

- CIVs in penetrations connected to the reactor coolant system sample line

No, these lines are not sump drain lines and are less than 2"

- CIVs in penetrations connected to letdown or reactor coolant pump bleedoff line

The letdown line does not meet the criteria because it is not a sump drain line and it is less than 2".

The reactor coolant pump bleedoff line is included in the containment isolation fault tree, but is not considered for large early releases, since it is less than 5".

- CIVs in penetrations connected to non-essential containment cooling

There is no non-essential containment cooling at Kewaunee.

- CIVs in penetrations used to support RCS inventory control safety function under accident condition

Yes, these valves are included in the containment isolation fault tree, but are not considered for large early releases, since they are less than 5".

- CIVs in penetrations used to support containment heat removal function using containment sprays

Yes, these valves are included in the containment isolation fault tree, but are not considered for large early releases, since the potential release path (the test lines) are less than 5".

- CIVs in penetrations used to support containment heat removal function using fan coolers

No, these lines are not sump drain lines and do not directly communicate with the RCS or containment.

3. To ensure that specific PRA's are adequate to support the requested TS changes, the staff will require each licensee to furnish, in its submittal, information on PRA quality, including:

   - Verification that the PRA reflects the asbuilt, as-operated plant.
   - Updates of the PRA since the last review cycle, including corrections of weaknesses identified in the past.
   - Details of their peer review process, a summary of the peer review findings, and a discussion of the independence on internal reviews/reviewers.
   - Description of the PRA quality assurance methods.
   - Results of reviews of pertinent accident sequences and cut sets for modeling adequacy and completeness (with respect to this application)

NMC Response

The PRA model used in the submittal reflects the as-built as-operated plant as of April 1998. There have been no changes to the plant since then that would affect the analysis in the submittal. A peer review of the Kewaunee PRA was conducted prior to the December 2 submittal of the Kewaunee Individual Plant Examination (IPE). This consisted of an independent internal review, involving plant staff who had not worked on the PRA, and an independent external review involving contractors who had not worked on the PRA.

The internal review was conducted by five people with senior Reactor Operator Licenses and four past or present Shift Technical Advisors. These reviewers were drawn from operations, reactor engineering, maintenance and operator training. The more major findings were as follows:

- The Non-safety related valves at the outlet of the component cooling heat exchangers should be credited
- Several motor operated valves (MOVs) were modeled as spuriously transferring when there was in reality no credible mechanism for them to do so.
- Several power supplies for MOVs were mis-identified.
- There is no procedural way to get to primary system bleed and feed during a steam generator tube rupture.
- Many reactor trips were miscategorized in the initiating event calculation.

The external review was lead by Sargent & Lundy Engineers. The reviewers were experts in a variety of PRA areas including human reliability, structural engineering, systems modeling, data analysis and accident sequences. Reviewers were from Sargent & Lundy, Battelle National Laboratory, Safety Management Incorporated, and Wisconsin Electric Power Company. The major findings were as follows:

- System initiators were modeled separately from the event tree models, potentially missing some dependencies.
- Fault tree truncation levels were inconsistent.
- Some support systems could be lost because the dummy probability assigned to them was less than 1.0.
- Human error dependence was not addressed in all cases.
- Common Cause was inappropriately applied.
- Human error probabilities appeared to be overly optimistic.
- Some initiating event frequencies appeared to be low.

All of the major findings of the internal and external reviews were properly addressed. Other findings were examined for validity after the review and addressed if necessary.

Subsequent to the review and the IPE, numerous changes were made to the Kewaunee PRA. The major changes were as follows:

- Addressed NRC Requests for Additional Information including:
    - Adding a new initiating event: Loss of a 4160 V AC bus.
    - Completely revising the Human Reliability Analysis to address several NRC concerns.
    - Changing containment fan coil unit success criteria to reflect equipment survivability concerns.
- Removed operator action to stop RHR pumps running on miniflow
- Took credit for RWST refill
- Took credit for air accumulators on certain AOV's
- Modeled alternate means of cooling air compressors
- Reactor cavity changed from dry to wet due to design change.
- Test & Maintenance modeled for both trains instead of just one.
- Loss of DC bus modeled for each train instead of most conservative.
- Loss of AC bus modeled for each train instead of most conservative.
- Component cooling modeled so each train has a 0.5 probability of being in standby.
- LOCA's, SGTR's, and SLB's modeled so each loop has a 0.5 probability of being the broken loop.
- Charging pump relief valve model corrected.
- Service water strainers removed based on analysis.
- A probability that Pressurizer PORV block valves are open was added, previously 1 of 2 was assumed open.

Each PRA revision, whether to the models or the documentation, is accomplished through a proceduralized form which is signed by two members of the PRA group, one as the author, one as the reviewer.

The primary area of concern for this application is the containment isolation model. The containment isolation model is complete in that it includes all the penetrations of interest. The cutoff for which penetrations contribute to the large early release frequency (LERF) is based on the Westinghouse Owners Group. The additional cutsets generated in this analysis were examined and determined to be reasonable.

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[1] Letter from Steven A. Varga (NRC) to C.W. Geisler (WPSC), dated April 22, 1983, "Completion of the Review of Venting and Purging Containment while at Full Power and Effect on LOCA (MPA B-24)."