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FEB 24 2012

L-PI-12-013
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
Renewed License Nos. DPR-42 and DPR-60

Response to Requests for Additional Information (RAI) Associated with Adoption of the Alternative Source Term (AST) Methodology (TAC Nos. ME2609 and ME2610)

In a letter to the U.S. Nuclear Regulatory Commission (NRC) dated October 27, 2009 (Agencywide Documents and Management System (ADAMS) Accession No. ML093160583), the Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (hereafter "NSPM"), requested an amendment to the Technical Specifications (TS) for Prairie Island Nuclear Generating Plant (PINGP). The proposed amendment requested adoption of the Alternative Source Term (AST) methodology, in addition to TS changes supported by AST design basis accident radiological consequence analyses.

Recently, the NRC staff conducted several conference calls with NSPM staff to discuss the technical details of NSPM's main steam line break atmospheric dispersion model, which was submitted in the subject AST application. To complete their review, the NRC staff requested additional information by electronic mail dated November 2, 2011 (ADAMS Accession No. ML113110094).

Enclosure 1 to this letter provides the NSPM response to questions 2 and 4 of the November 2, 2011 request for additional information. Enclosure 2 provides a proposed markup to the TS and Enclosure 3 provides a description and justification of the TS changes. Enclosure 4 provides a proposed markup of the TS Bases for your information. Final TS Bases changes will be implemented pursuant to TS 5.5.12, "Technical Specifications (TS) Bases Control Program," at the time the amendment is implemented. Enclosure 5 provides a draft markup of the Updated Safety Analysis Report (USAR) for your information.

NSPM submits this supplement in accordance with the provisions of 10 CFR 50.90.

The supplemental information provided in this letter does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the October 27, 2009 submittal, supplemented by letters dated April 29, 2010 (ADAMS Accession No. ML101200083), May 25, 2010 (ADAMS

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Accession No. ML101460064), June 23, 2010 (ADAMS Accession No. ML101760017), August 12, 2010 (ADAMS Accession No. ML102300295), December 17, 2010 (ADAMS Accession No. ML103510322), June 22, 2011 (ADAMS Accession No. ML111740145), July 11, 2011 (ADAMS Accession No. ML111930157), August 9, 2011 (ADAMS Accession No. ML112220098), December 8, 2011 (ADAMS Accession No. ML113430091), and February 13, 2012.

In accordance with 10 CFR 50.91, NSPM is notifying the State of Minnesota of this License Amendment Request (LAR) supplement by transmitting a copy of this letter to the designated State Official.

If there are any questions or if additional information is needed, please contact Glenn Adams at (612) 330-6777.

Summary of Commitments

This letter contains two new commitments:

Commitment	Due Date
1. Implement a plant modification that will either block the 121 Laundry Fan exhaust flow path permanently or will otherwise remove the 121 Laundry Fan exhaust path as a potential source of post-accident radioactive release through the Auxiliary Building Ventilation Exhaust stack.	Within 90 days after completion of the outage in which the Unit 2 Replacement Steam Generators are installed.
2. Implement an administrative control to require Auxiliary Building Special Ventilation Zone boundary integrity during movement of heavy loads over an open reactor vessel containing irradiated fuel assemblies when the containment atmosphere is open to the outside (as described in USAR 12.2.12).	Within 90 days after completion of the outage in which the Unit 2 Replacement Steam Generators are installed.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on FEB 24 2012

Mark A. Schimmel
Mark A. Schimmel
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (5)

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota

ENCLOSURE 1

In a letter to the U.S. Nuclear Regulatory Commission (NRC) dated October 27, 2009 (Agencywide Documents and Management System (ADAMS) Accession No. ML093160583), the Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (hereafter "NSPM"), requested an amendment to the Technical Specifications (TS) for Prairie Island Nuclear Generating Plant (PINGP). The proposed amendment requested adoption of the Alternative Source Term (AST) methodology, in addition to TS changes supported by AST design basis accident radiological consequence analyses.

Recently, the NRC staff conducted several conference calls with NSPM staff to discuss the technical details of NSPM's main steam line break atmospheric dispersion model, which was submitted in the subject AST application. To complete their review, the NRC staff provided a request for additional information (RAI) by electronic mail dated November 2, 2011 (ADAMS Accession No. ML113110094). For clarity, the NRC RAI information is provided below in italics font and the NSPM response is provided in plain font.

Background:

Following a conference call with the NRC staff on September 22, 2011, the licensee provided the following information concerning the design criteria for the Common Area of the Auxiliary Building (CAAB):

> *Updated Safety Analysis Report (USAR), Table 12.2-1, Page 1 indicates that the Common Area of the Auxiliary Building is a Design Class III* structure (i.e., above the concrete part of the structure). The CAAB is referred to as "Auxiliary Building (Except Class I or I*)" in the Table. This is a Design Class III* structure. USAR Table 12.2-4 indicates that Class III* structures are designed for Dead + Live + Wind or Snow normal operating loads and Dead + Live + Uniform Building Code Zone I (earthquake) Loads. USAR Section 12.2.1.3.1 defines snow loading as 50 lbs per sq-ft and the design wind speed as 100 mph. USAR Section 12.2.1.4.1d describes the load combinations for Class III* structures. These structures are designed for the greater of the above load combinations, where the Uniform Building Code Zone I earthquake loads are 0.05g. Although the CAAB is a corrugated steel building, it is structurally sound with fairly rigorous design criteria.*

RAI 2:

The NRC staff's understanding is that the common area of the auxiliary building (CAAB) is from elevation 755' to 809' and between columns 7 to 11 and J to Q (from USAR Figure 1.1-8 and Figure 1.1-16). The CAAB has metal siding between elevations 775' and 809'. There are no ventilation systems directly supplying fresh air to or providing exhaust from this area. Under normal operation the CAAB pressure is maintained

negative relative to atmosphere through indirect connection to one of the two unit's auxiliary building exhaust systems. Below elevation 775', the CAAB walls are concrete construction or have adjacent unit specific auxiliary building spaces. Please verify if the NRC staff's understanding is correct or provide information needed to correct the staff's understanding.

NSPM Response:

The Staff's understanding is correct as stated in RAI 2 with the following exceptions:

- The paragraph describes that "*under normal operation the CAAB pressure is maintained negative relative to atmosphere through indirect connection to one of the two unit's auxiliary building exhaust systems.*" This is not correct. There is no connection between the CAAB atmosphere and the auxiliary building exhaust system that would significantly reduce CAAB pressure below atmosphere. Under normal operation the CAAB pressure is atmospheric.
- The paragraph describes that "*there are no ventilation systems directly supplying fresh air to or providing exhaust from this area*". In fact, there are ventilation systems that could (under certain conditions) exhaust air from the CAAB.
    - Under normal operating conditions, a low-capacity fan draws from laundry dryers and tank vents (located in the CAAB) and exhausts into the Auxiliary Building Normal Ventilation System (ABNVS) downstream of Unit 2 exhaust fan.
    - Also, by an indirect and improbable means, it can be postulated that the ABNVS could draw air from the CAAB if boundary integrity is not established for the Auxiliary Building Special Ventilation Zone (ABSVZ) during extraordinary plant shutdown conditions.

  Both of these exhaust paths are described later in the reply to RAI 4, in context of potential accident release paths.
- The paragraph also describes the CAAB boundary as 755' to 809' elevations; however, with elimination of Spent Fuel Pool Special Ventilation System (SFPSVS) boundary requirements (TS 3.7.13), the CAAB may be expanded to include the Spent Fuel Pool (SFP) Enclosure. Thus, the CAAB is open from the ground elevation 695' to the roof elevation 809' on the south end of the building between approximately Columns Q to P.3 bordering the spent fuel pool enclosure. The CAAB boundary then extends north along the top of the spent fuel pool enclosure, down the north wall of the Spent Fuel Pool Enclosure to the roof of the filter room at approximately M.3. The boundary then extends north along the filter room roof (el. 755') and down the north wall of the filter room to elevation 735'. There is an open stairwell and other openings around ventilation ductwork that allow communication between elevation 755' and elevation 735' in this area, such that the Laundry and Dressing Area communicates with the CAAB. There is no direct communication with rooms below these areas.

RAI 4:

Please discuss releases from the Auxiliary Building Exhaust stacks (USAR Fig. 10.3-6). The auxiliary building exhaust stacks are identified on USAR Figure 10.3-6 at approximate coordinates A-9 and A-10. These exhaust stacks are not identified as a potential release point in Table 3.1-2, "Release Points and Receptor Locations", of the LAR. These exhaust stacks are not discussed in LAR section 3.1.3. Discussion of the auxiliary building exhaust stacks was not identified in any other section of the LAR, however, such discussion may have been missed by the reviewer. The discussion should indicate why the auxiliary building exhaust stacks are not considered a release point. If the justification is the exhaust fans are tripped on a safety related signal at the onset of an accident (e.g., emergency diesel load sequencing), verify the fans are shut down on an accident with no loss of offsite power. If potential releases are enveloped by a more conservative release-receptor combination, please indicate so.

NSPM Response:

No post-accident radiological releases from the Auxiliary Building Exhaust stacks are considered in the radiological consequence analysis because control systems ensure that (1) the normal large-capacity exhaust fans are tripped off (removing the primary driving mechanism), (2) the associated discharge dampers are isolated (providing positive isolation to prevent the passive migration of gases from the exhaust system), and (3) actuation of the special ventilation system draws a negative pressure on the ABNVS. These control functions are described more fully below, along with the special features that prevent the unique Unit 2 exhaust stack from becoming a limiting release source during radiological accidents.

At the initiation of radiological events that affect the Auxiliary Building, the ventilation system control circuit is designed to automatically actuate the Auxiliary Building Special Ventilation System (ABSVS) and isolate the ABNVS to prevent radiological release from the Auxiliary Building Exhaust Stacks. System logic circuitry ensures that these systems are actuated in the above manner whether or not offsite power is available. Thus, the analysis does not rely on a loss of offsite power to ensure that ABNVS exhaust fans are secured.

Both trains of ABSVS are actuated by either a Safety Injection (SI) signal in either unit or a High Radiation signal (in the Auxiliary Building Ventilation Exhaust ductwork). Actuation of either Train A or Train B ABSVS fan will secure the ABNVS make-up fans and the general exhaust air fans, in addition to closing the make-up dampers and major exhaust dampers. Thus, the fans are shutdown and the flow path isolated automatically as part of the response to an accident that generates an SI signal or a High Radiation Signal. Thus, the ABNVS is automatically isolated for these events.

As described in the response to RAI 2, two possible paths have been identified where radioactivity could bypass the isolation of the ABNVS and be released to the ABNVS exhaust stack.

- Under normal operating conditions, a low-capacity fan draws from laundry dryers and tank vents (located in the CAAB) and exhausts into the ABNVS downstream of Unit 2 exhaust fan.
- Also, by an indirect and improbable means, a scenario could be postulated that the ABNVS could draw air from the CAAB if boundary integrity is not established for the Auxiliary Building Special Ventilation Zone (ABSVZ) during extraordinary plant shutdown conditions.

Each of these potential paths is discussed below.

ABNVS Exhaust through 121 Laundry Dryer Exhaust Fan

For a Fuel Handling Accident (FHA), Heavy Load Drop (HLD), or Main Steam Line Break (MSLB) accident, the radionuclides released into the CAAB could migrate to a small ventilation exhaust path that originates at the laundry dryers and the Chemical and Volume Control System (CVCS) Monitor Tank vents (in the CAAB). Ventilation ductwork for this exhaust path penetrates the CAAB / Auxiliary Building boundary and exhausts through the Unit 2 Auxiliary Building Normal Ventilation (ABNV) Stack through the 121 Laundry and Monitor Tank Room fan. For simplicity, the 121 Laundry and Monitor Tank Room Fan will be referred to as the 121 Laundry Fan in this response.

The exhaust from the 121 Laundry Fan is directed into the Unit 2 ABNVS exhaust line downstream of the isolation damper and is released through the Unit 2 ABNV Stack. Thus, if the 121 Laundry Fan were running, it could provide a potential path to the environment. The 121 Laundry Fan draws air from the Laundry Dryers and the three CVCS Monitor Tanks (small exhaust from the atmosphere above the liquid inside the three tanks) on the 735' elevation of the CAAB at a low volumetric flowrate (less than 2000 cfm).

Activity released from a FHA, HLD, or MSLB event would need to traverse through a relatively tortuous path to be released through the 121 Laundry Fan. In order to reach this area of the 735' elevation, the activity needs to first reach the 755' elevation of the CAAB and go down through three relatively small openings (one stairwell and two openings provided for ductwork traverse).

Notwithstanding the likelihood that dilution in the auxiliary building would significantly mitigate a radioactive release via the 121 Laundry Fan, this specific release path is not recognized and has not been analyzed in the current licensing basis. Therefore, the issue is being addressed in NSPM's corrective action program (CAP). NSPM commits to implement a plant modification that will either block the subject flow path permanently

or will otherwise remove the 121 Laundry Fan exhaust path as a potential source of post-accident radioactive release through the Auxiliary Building Normal Ventilation Exhaust stack.

Conclusion
As described above, the flow paths for the radioactivity from a FHA, HLD or MSLB to reach the 121 Laundry Fan are relatively tortuous and would be diluted prior to reaching the release point. However, rather than crediting this dilution, or analyzing the ABNVS stack as a release point, NSPM has committed to install a modification that precludes a release that might be otherwise propagated by the operation of the 121 Laundry Fan. By precluding this release path, the modification will preserve the integrity of the ABSVS zone and the AST analyses that assume the CAAB as the limiting release point.

ABNVS Exhaust When ABSVZ Integrity Is Not Established

In response to the RAI question, NSPM staff re-examined the radiological accidents and the possible operating conditions of the ABNVS to identify any other potential for accident release from the auxiliary building normal exhaust stacks. The only additional vulnerability stemmed from having a common ABSVS shared between the two units, in conjunction with a common Technical Specification for that system. This vulnerability is discussed below.

Normally, with either unit in Modes 1-4, TS 3.7.12 would ensure the integrity of the ABSVZ prior to the accident and thereby ensure that the radiological release from a FHA and a HLD[1] would not escape from the CAAB into the ABSVZ. With respect to the proposed AST LAR, this ABSVZ integrity ensures the CAAB is the limiting release point for a FHA and a HLD.

However, TS 3.7.12 is inadequate for the proposed amendment in that it does not ensure ABSVZ integrity for the unlikely event that neither PINGP unit is operating in Modes 1-4. For example, if Unit 1 experienced a Mode 6 FHA when Unit 2 was in Mode 5 (or 6) with the ABSVZ compromised, the radioactive plume could be drawn from containment or the SFP into the CAAB, through the compromised ABSVZ boundary, and into the ABNVS exhaust. This path would compromise the assumption that the CAAB was the limiting release path for the FHA.

To remedy this condition and restore the viability of the proposed radiological analysis that assumes the CAAB is the limiting release point, NSPM proposes a revised TS 3.7.12 to extend the ABSVZ operability statement to include the fuel handling operations that are precursors to the FHA. Thus, TS 3.7.12 will be revised to require that the ABSVS be OPERABLE during movement of irradiated fuel assemblies.

[1] The HLD of concern is a non-design basis event described in USAR Section 12.2.12 involving a HLD over the reactor with the containment atmosphere open to the outside. This event evokes a 7-day minimum wait after subcriticality, and assumes a release from the CAAB.

In this manner, it can be assured that the radioactive release from the FHA will be enveloped by the CAAB until released from the point assumed in the analysis. The revised TS markup is attached as Enclosure 2 to this letter.

Also, for the HLD event in containment (a non-design basis event described in USAR 12.2.12), the current set of administrative restrictions does not ensure ABSVZ operability during movement of heavy loads over an open reactor vessel containing irradiated fuel assemblies (when the containment is open to atmosphere). Without ABSVZ integrity, the plume from this non-design basis event could migrate from the containment, through the compromised ABSVZ boundary, and into the ABNVS exhaust. This path would compromise the assumption that the CAAB was the limiting release path for this particular HLD event.

To remedy this condition and restore the viability of the proposed radiological analysis that assumes the CAAB is the limiting release point, NSPM commits to a revised administrative restriction to require ABSVZ operability during heavy load handling operations that are a precursor to this specific HLD event. Thus, NSPM commits to implement an administrative control to require Auxiliary Building Special Ventilation Zone boundary integrity during movement of heavy loads over an open reactor vessel containing irradiated fuel assemblies when the containment atmosphere is open to the outside (as described in USAR 12.2.12).

In this manner, it can be assured that the radioactive release from the HLD will be enveloped by the CAAB until released from the point assumed in the analysis. For information, the revised USAR markup is attached as Enclosure 4 to this letter.

The effect of this condition on the current radiological analysis of FHA and HLD has been identified in the NSPM CAP. Note that the aforementioned condition is not applicable to the MSLB because a logical precursor to the MSLB is the operation of the accident unit in an operating Mode 1-4, which would invoke TS 3.7.12.

<u>Conclusion</u>
As described above, TS 3.7.12 and USAR 12.2.12 do not ensure that the ABSVZ integrity will be established prior to a FHA and HLD respectively. However, the proposed TS and USAR revisions will extend the ABSVZ operability statement to include fuel handling operations that are precursors to the FHA, and the heavy load handling operations that are precursors to the HLD. In this manner, it can be assured that the radioactive release from the FHA and HLD will be enveloped by the CAAB until released from the point assumed in the analysis. By precluding this release path, the TS and USAR revisions will preserve the integrity of the ABSVZ and the AST analyses that assume the CAAB as the limiting release point.

Technical Specification Pages (Markup)

3.7.12-1
3.7.12-2
3.7.12-3

3 pages follow

3.7 PLANT SYSTEMS

3.7.12 Auxiliary Building Special Ventilation System (ABSVS)

LCO 3.7.12 Two ABSVS trains shall be OPERABLE.

--------------------------------------NOTE--------------------------------------
The ABSVS boundary may be opened under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4~~.~~,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ABSVS train inoperable.	A.1 Restore ABSVS train to OPERABLE status.	7 days
B. Two ABSVS trains inoperable due to inoperable ABSVS boundary in MODES 1, 2, 3, or 4.	B.1 Restore ABSVS boundary to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. Two ABSVS trains inoperable due to inoperable ABSVS boundary during movement of irradiated fuel assemblies. OR Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each ABSVS train for $\geq$ 15 minutes with the heaters operating.	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.12.2	Perform required ABSVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.3	Verify each ABSVS train can produce a negative pressure within 20~~6~~ minutes after initiation.	92 days
SR 3.7.12.4	Verify each ABSVS train actuates on an actual or simulated actuation signal.	24 months

ENCLOSURE 3

Evaluation of the Proposed TS Changes

PROPOSED CHANGES

Brief descriptions of the associated proposed TS changes are provided below along with discussions of the justification for each change. The specific wording changes to the TS are provided in Enclosure 2.

TS 3.7.12, "Auxiliary Building Special Ventilation System (ABSVS)"

- APPLICABILITY: The APPLICABILITY is expanded to include movement of irradiated fuel assemblies.

  Justification: Whereas the APPLICABILITY was previously limited to MODES 1-4, the proposed change would ensure ABSVS operability for all times that irradiated fuel is being moved (regardless of either unit's operating MODE). This change will ensure that the supporting ventilation boundaries are established during fuel movement to ensure that any release from a fuel handling accident (FHA) will be confined to the areas assumed in the radiological analyses.

- CONDITION B: Consistent with the expansion of the APPLICABILITY to include movement of irradiated fuel, CONDITION B is revised to apply only during MODES 1, 2, 3, or 4.

  Justification: This change retains the original intent of the CONDITION, which originally applied these ACTIONS and COMPLETION TIMES only to MODES 1, 2, 3, or 4. A new CONDITION D has been created to specifically address the two-train ABSVS inoperability during movement of irradiated fuel assemblies.

- CONDITION C: Consistent with the expansion of the APPLICABILITY to include movement of irradiated fuel, CONDITION C is revised to apply only during MODES 1, 2, 3, or 4.

  Justification: This change retains the original intent of the CONDITION, which originally applied these ACTIONS and COMPLETION TIMES only to MODES 1, 2, 3, or 4. A new CONDITION D has been created to specifically provide ACTIONS and COMPLETION TIMES during movement of irradiated fuel assemblies.

- CONDITION D: The proposed change would add a new CONDITION to describe the REQUIRED ACTION and COMPLETION TIME for ABSVS inoperability during movement of irradiated fuel.

Justification: Whereas CONDITION A allows irradiated fuel movement for 7 days with one ABSVS train inoperable, the REQUIRED ACTIONS and COMPLETION TIMES of CONDITION D require immediate suspension of fuel movement when the ABSV boundary is inoperable. In this CONDITION, the ABSVS boundary would not perform the isolation function required by the radiological analyses, so the prudent action is to suspend without delay the activity that would be the initiating event for a fuel handling accident. This REQUIRED ACTION and COMPLETION TIME is consistent with a similar TS (3.7.10).

In summary, these changes are acceptable because they conservatively expand the APPLICABILITY of ABSVS operability to include movement of irradiated fuel assemblies; a potential accident initiator that had not been considered previously. The proposed CONDITIONS, REQUIRED ACTIONS, and COMPLETION TIMES are consistent with similar Technical Specifications.

TS Bases Pages (Markup)

For Information Only

Note that this markup includes the draft changes provided in the license amendment request dated October 27, 2009

8 pages follow

B 3.7 PLANT SYSTEMS

B 3.7.12 Auxiliary Building Special Ventilation System (ABSVS)

BASES

BACKGROUND

The ABSVS is a standby ventilation system, common to the two units, that is designed to collect and filter air from the Auxiliary Building Special Ventilation (ABSV) boundary following a loss of coolant accident (LOCA). The ABSV boundary contains those areas within the auxiliary building which have the potential for collecting significant containment leakage that could bypass the shield building and leakage from systems which could recirculate primary coolant during LOCA mitigation.

Whereas the ABSVS function during plant operating modes is to contain the radioactivity release within the ABSV boundary and process it accordingly, the ABSVS function for the fuel handling accident (in containment or spent fuel pool) is to maintain a ABSV boundary that prevents the radioactivity release that occurs outside the ABSV boundary from entering into the Auxiliary Building Special Ventilation Zone (ABSVZ). This refueling function is therefore unique and does not require further processing of the released radioactivity (because the radioactivity is prevented from entering the ABSVZ).

The ABSVS consists of two independent and redundant trains. Each train consists of a heater, a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan.

Ductwork, dampers, and instrumentation also form part of the system. The system initiates filtered ventilation of the ABSV boundary following receipt of a safety injection (SI) signal, high radiation signal or manual initiation. The radiation signal is not credited in the USAR for accident mitigation.

BASES

BACKGROUND (continued)

The exhaust from the main condenser air ejector is directed to the ABSVS for filtering prior to exhausting from the plant via the shield building stack to mitigate steam generator tube leakage.

When the ABSVS actuates, the normal nonsafeguards supply and exhaust dampers close automatically, and the Auxiliary Building Normal Ventilation System supply and exhaust fans trip. The prefilters remove any large particles in the air, and with the heaters, reduce the level of entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. The heaters are designed to dry incoming air at 100% saturation by increasing the temperature of the air entering the charcoal bed. The air is then dry enough to support the charcoal adsorber iodine removal efficiency requirements.

The ABSVS would typically only be used for post accident atmospheric cleanup functions. The ABSVS and ABSV boundary are discussed in the USAR (References 1, 2 and 3).

APPLICABLE SAFETY ANALYSES

The design basis of the ABSVS is established by the large break LOCA. The potential leakage paths from the containment to the auxiliary building are discussed in Reference 1. The system evaluation assumes a passive failure of the ECCS outside containment, such as an RHR pump seal failure, during the recirculation mode (Ref. 4). In such a case, the system limits radioactive release to within the 10 CFR ~~100~~ 50.67 (Ref. 5) limits. The analysis of the effects and consequences of a large break LOCA is presented in References 3 and 4. The ABSVS also actuates following a small break LOCA, in those cases where the ECCS goes into the recirculation mode of long term cooling, to clean up releases of smaller leaks, such as from valve stem packing.

A less-limiting function of the ABSVS is to prevent the radiological release of the fuel handling accident (FHA) from entering the ABSVZ. Whether the accident initiates in the SFP or in the containment, the radiological analyses of the FHA assume the

BASES

APPLICABLE SAFETY ANALYSES (continued)

release point is the Common Area of the Auxiliary Building (CAAB), which is considered the limiting release point for Control Room dose evaluation. The ABSVZ boundary prevents the intrusion of radioactivity into the ABSVZ where it may be exhausted out the ABNVS Exhaust Stack(s), which may be closer to the respective Control Room intake than the assumed release point. These radiological analyses do not take any credit for ABSVS fan operation or filtering; the only credited function is isolation. Noting however that the ABSV boundary operability allows up to 10 square feet of openings through which the FHA plume could be assumed to pass, credit is taken for ABSVS actuation on the High Radiation signal whereupon the plume is filtered and discharged from a location that is less limiting for the Control Room dose than that assumed in the analysis (i.e., the CAAB).

The ABSVS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent and redundant trains of the ABSVS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train.

This OPERABILITY requirement ensures that the atmospheric releases, in the event of a Design Basis Accident (DBA) in containment, from ECCS pump leakage and containment leakage which bypasses the shield building would not result in doses exceeding 10 CFR 100 limits (Ref. 5).

In order for the ABSVS to be OPERABLE, the Turbine Building roof exhauster fans must be capable of being de-energized within 30 minutes following a loss of coolant accident.

BASES

LCO (continued)

An ABSVS train is considered OPERABLE when its associated:

a. Fan is OPERABLE;

b. HEPA filter and charcoal adsorbers are capable of passing their design flow and performing their filtration functions;

c. Heater, ductwork, and dampers are OPERABLE and air circulation can be maintained; and

d. Instrumentation and controls are OPERABLE.

The ABSV boundary is OPERABLE if both of the following conditions can be met:

a. Openings in the ABSV boundary are under direct administrative control and can be reduced to less than 10 square feet within ~~6~~20 minutes following an accident; and

b. Dampers and actuation circuits that isolate the Auxiliary Building Normal Ventilation System following an accident are OPERABLE or can be manually isolated within ~~6~~20 minutes following an accident.

The LCO is modified by a Note allowing the ABSV boundary to be opened under administrative controls. As discussed above, openings must be closed to less than 10 square feet within ~~6~~20 minutes following an accident.

APPLICABILITY

In MODES 1, 2, 3, and 4 for either unit, the ABSVS is required to be OPERABLE.

In addition, during movement of irradiated fuel assemblies, the ABSV boundary must be OPERABLE to prevent releases from a fuel handling accident from entering the ABSV zone.
~~When both units are in MODE 5 or 6, the ABSVS is not required to be OPERABLE.~~

BASES (continued)

ACTIONS

A.1

With one ABSVS train inoperable, action must be taken to restore OPERABLE status within 7 days. During this time, the remaining OPERABLE train is adequate to perform the ABSVS function.

The 7 day Completion Time is appropriate because the ABSVS risk contribution is substantially less than that for the ECCS (72 hour Completion Time). The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

Concurrent failure of two ABSVS trains would result in the loss of functional capability; therefore, LCO 3.0.3 must be entered immediately.

B.1

In MODE 1, 2, 3, or 4, wWith both ABSVS trains inoperable due to an inoperable ABSV boundary, action must be taken to restore OPERABLE status within 24 hours.

The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the availability of the ABSVS to provide a filtered release (albeit with potential for some unfiltered leakage).

If the ABSV boundary cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply.

BASES

ACTIONS (continued)

C.1 and C.2

In MODE 1, 2, 3, or 4, iIf an ABSVS train cannot be restored to OPERABLE status or the ABSV boundary cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply.

To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

With both ABSVS trains inoperable due to an inoperable ABSV boundary or if the inoperable ABSVS train cannot be restored to OPERABLE status within the required Completion Time during movement of irradiated fuel assemblies, action must be taken immediately to suspend activities that could result in a release of radioactivity. This places the plant in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

This SR verifies that each ABSVS train can be manually started and the associated filter heater energizes.

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Each ABSVS. train must be operated ≥ 15 minutes per month with the heaters

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1 (continued)

energized. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available

SR 3.7.12.2

This SR verifies that the required ABSVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorbers efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations).

Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.3

This SR verifies proper functioning of the ABSVS by verifying the integrity of the ABSV boundary and the ability of the ABSVS to maintain a negative pressure with respect to potentially uncontaminated adjacent areas.

During the post accident mode of operation, the ABSVS is designed to maintain a slight negative pressure within the ABSV boundary with respect to the containment and shield building.

Each ABSVS train is started from the control room and the following are verified:

a. Associated Auxiliary Building Normal Ventilation System fans trip and dampers close; and

b. A measurable negative pressure is drawn within the ABSV boundary within 20~~6~~ minutes after initiation, with a 10 square foot opening within the ABSV boundary.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.12.3 (continued)

The 92 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.4

The ABSVS initiates on a safety injection signal, high radiation signal or manual actuation. This SR verifies that each ABSVS train starts and operates on an actual or simulated safety injection actuation signal or on manual initiation.

The 24 month Frequency is consistent with industry reliability experience for similar equipment. The 24 month Frequency is acceptable since this system usually passes the Surveillance when performed.

REFERENCES

1. USAR, Appendix G.
2. USAR, Section 10.3.
3. USAR, Section 14.
4. USAR, Section 6.7.
5. 10 CFR ~~100.11~~50.67.

USAR Page (Markup)

For Information Only

12.2.12-6

1 page follows

c. A load drop analysis was completed for lifting the Reactor Vessel Head over irradiated fuel in an open vessel. The bottom of the reactor vessel head shall not be lifted higher than an elevation of 756.5 feet (Reference 56).

The residual heat piping is protected from heavy load drop hazards by structural members of overhead floor levels; therefore, heavy loads may be moved over the reactor coolant pump vaults without administrative control.

Safe shutdown equipment is that equipment required for continued decay heat removal and for maintaining the plant shutdown. The steam generators and/or residual heat removal systems are required per TS 3.1. Since no single load can be carried over both steam generators, the auxiliary feedwater, main feedwater and steam piping in containment are considered part of the safe load path.

With the reactor coolant system temperature above Mode 5, Cold Shutdown, the Containment Building polar crane will not be used for moving loads without specific written procedures.

During heavy load lifts over the open fueled reactor vessel, at least one isolation valve will be closed in each line penetrating the containment which provides a direct path from the containment atmosphere to the outside, except as described below.

Movement of the reactor vessel head and upper internals over the open fueled reactor after the fuel has been subcritical in excess of seven days is permissible with containment atmosphere open to the outside with the following restrictions (Reference 61):

a. The bottom of the upper internals shall not be lifted higher than an elevation of 735′-6″.

b. Administrative controls shall be in place to provide containment closure within 1 hour of a dropped load.

The 230 Ton Reactor Building Cranes were purchased from Whiting Corporation of Illinois in the late sixties. The specification against which these cranes were purchased predates CMAA Specifications #70. However, the cranes were qualified against EOSI Specification #61 and USAS B30.2-1967. A review verified the cranes substantially meet the requirements of CMAA Specification #70.

c. Administrative controls shall be in place to ensure Auxiliary Building Special Ventilation Zone boundary integrity.