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May 23, 2000
BVY 00-48

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

Subject: **Vermont Yankee Nuclear Power Station**
License No. DPR-28 (Docket No. 50-271)
Technical Specification Proposed Change No. 234
Reactor Coolant Chemistry – Conductivity and Chlorides

Pursuant to 10CFR50.90, Vermont Yankee (VY) hereby proposes to amend its Facility Operating License, DPR-28, by incorporating the attached proposed change into the VY Technical Specifications (TS). This proposed change would relocate portions of the "Reactor Coolant System – Coolant Chemistry" TS 3/4.6.B from the Technical Specifications to the Technical Requirements Manual controlled by the 10CFR50.59 process. The affected Specifications contain requirements for reactor coolant conductivity and chloride concentration. This change is consistent with Standard Technical Specifications[1] and changes previously approved by NRC for other boiling water reactors.

Attachment 1 to this letter contains supporting information and the safety assessment of the proposed change. Attachment 2 contains the determination of no significant hazards consideration. Attachment 3 provides the marked-up version of the current Technical Specification and Bases pages. Attachment 4 is the retyped Technical Specification and Bases pages.

VY has reviewed the proposed Technical Specification change in accordance with 10CFR50.92 and concludes that the proposed change does not involve a significant hazards consideration.

VY has also determined that the proposed change satisfies the criteria for a categorical exclusion in accordance with 10CFR51.22(c)(9) and does not require an environmental review. Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment needs to be prepared for this change.

Upon acceptance of this proposed change by the NRC, VY requests that a license amendment be issued by October 31, 2000 for implementation within 60 days of its effective date.

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[1] NUREG 1433, Revision 1, Standard Technical Specifications for General Electric Plants, BWR/4, dated April 7, 1995.

A001

NRR-057

If you have any questions on this transmittal, please contact Mr. Thomas B. Silko at (802) 258-4146.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Samuel L. Newton
Vice President, Operations

STATE OF VERMONT)
)ss
WINDHAM COUNTY)

SALLY A. SANDSTRUM NOTARY PUBLIC WINDHAM COUNTY, VERMONT

Then personally appeared before me, Samuel L. Newton, who, being duly sworn, did state that he is Vice President, Operations of Vermont Yankee Nuclear Power Corporation, that he is duly authorized to execute and file the foregoing document in the name and on the behalf of Vermont Yankee Nuclear Power Corporation, and that the statements therein are true to the best of his knowledge and belief.

Sally A. Sandstrum, Notary Public
My Commission Expires February 10, 2003

Attachments

cc: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS
Vermont Department of Public Service

Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 234

Reactor Coolant Chemistry – Conductivity and Chlorides

Supporting Information and Safety Assessment of Proposed Change

INTRODUCTION

Purpose

The purpose of this proposed change is to relocate the Technical Specification (TS) reactor coolant chemistry requirements for conductivity and chloride concentration from the TS to the Technical Requirements Manual (TRM).

TS Section 3/4.6.B provides chemistry requirements for the reactor coolant system for all operational modes. Specifications 3.6.B.2, 3.6.B.3, and 3.6.B.4 provide specific limits on coolant conductivity and chloride content. Associated surveillance requirements 4.6.B.2 and 4.6.B.3 control the monitoring, sampling, and analysis of reactor coolant. Action requirements are specified in TS 3.6.B.5 for situations in which the specified limits cannot be met.

Description of the Proposed Change

The current requirements stipulated by Specifications 3/4.6.B.2, 3/4.6.B.3 and 3.6.B.4 will be relocated to the TRM, and 3.6.B.5 will be repeated in the TRM as applicable to these relocated Specifications. Because of the relocation of the above TS sections, as an administrative change, TS 3.6.B.5 will be renumbered to 3.6.B.2. In addition, minor reformatting and capitalization changes are being made to correct administrative errors. The associated Bases will also be relocated to the TRM, and a single word correction is being made in Bases Section 3/4.6.C.

Relocation of the subject TS to the TRM is acceptable based on the criteria of 10CFR50.36 and the considerations of NRC's Final Policy Statement on Technical Specifications Improvements[1]. Changes to the Vermont Yankee (VY) TRM are subject to the 10CFR50.59 process. In addition, the requested change is consistent with industry Standard Technical Specifications[2] and similar to other NRC-approved changes to Technical Specifications[3].

Need for Proposed Change

The proposed change will support VY plans for the application of Noble Metal Chemical Addition (NMCA), which is scheduled to occur at the end of the current operating cycle (approximately May 1, 2001). VY intends to inject noble metal compounds into the reactor vessel to ameliorate the potential for crack initiation and to mitigate crack growth in the reactor vessel surfaces, internal components and piping because of intergranular stress corrosion cracking. NMCA also serves to reduce radiation fields occurring from implementation of hydrogen water chemistry.

The application of noble metals at VY will be similar to the processes previously used at a number of operating boiling water reactors. Coolant conductivity should temporarily increase during the injection

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[1] USNRC "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," 58FR39132, dated July 22, 1993.

[2] NUREG 1433, Revision 1, Standard Technical Specifications for General Electric Plants, BWR/4, dated April 7, 1995.

[3] Letter from D. M. Skay (NRR) to O. D. Kingsley (ComEd), "Issuance of Amendments (TAC Nos. MA5879 and MA5880)," for the LaSalle County Station, Units 1 and 2, dated October 1, 1999.

of noble metal solutions due to reaction products. To account for this expected increase, the conductivity limits relocated to the TRM may be changed as necessary to provide temporary allowance for higher levels of conductivity during and immediately following NMCA. Any change to the TRM will be strictly controlled in accordance with the provisions of 10CFR50.59. The increase in conductivity should only occur for a relatively short period until the reactor water cleanup system reduces conductivity to pre-application levels.

TS Bases

Conforming changes are also being made to the associated TS Bases by relocating the associated sections to the TRM. One unrelated word change is being made in Bases section 3/4.6.C to correct an administrative error that occurred in a previous request for a license amendment. The word "equivalent" as used to describe a drain sump is being changed to "equipment" to reflect the correct terminology.

BACKGROUND

TS 3/4.6.B provides chemistry limits for the reactor coolant system under all operational modes. The chemistry limits for the reactor coolant system are established to prevent damage to reactor materials in contact with the coolant. To prevent stress corrosion cracking of the stainless steel, coolant chloride limits are specified. The effect of chloride is not as great when the oxygen concentration of the coolant is low; thus, the higher limit on chlorides permitted during power operation. During shutdown and refueling operations, the temperature necessary for stress corrosion to occur is not present, so higher concentrations of chlorides are not considered harmful during these periods.

Conductivity is monitored on a continuous basis since this parameter is a good overall indicator of coolant chemistry. When the conductivity is in its normal range, pH, chlorides and other impurities affecting conductivity will also be within their acceptable limits. Samples of the coolant are taken periodically and serve as a reference for calibration of the conductivity monitors.

Non-fuel assembly materials in the primary system are primarily type-304 stainless steels. The reactor water chemistry limits are established to provide an environment favorable to these materials. Limits are placed on coolant conductivity and chloride content to prevent stress corrosion cracking of primary system materials. Conductivity is limited because it can be continuously and reliably measured and gives an indication of abnormal conditions and the presence of unusual materials in the coolant. Chloride limits are specified to prevent stress corrosion cracking of stainless steel.

Periodically, and when conductivity becomes abnormal, chloride measurements are made to determine whether they are also within their normal operating values. It is recognized that in some cases conductivity could be high as a result of the presence of a neutral salt that would not have an effect on pH or chloride concentration.

In boiling water reactors where near neutral pH is maintained, conductivity provides a good and prompt measure of the quality of the reactor water. Significant changes in conductivity provide the reactor operator with a warning mechanism to allow the operator to remedy the condition before reactor coolant chemistry limits are reached. Methods available to the operator for correcting the off-standard condition include operation of the reactor water cleanup system, reducing the input of impurities, and placing the reactor in a cold shutdown condition.

During reactor startup and hot standby, the dissolved oxygen content of reactor water may be higher than during normal power operation. During this period more restrictive limits are placed on chloride ion concentration. After power operation has been established, boiling deaerates the reactor water thus reducing the influence of oxygen on potential chloride stress corrosion cracking.

Comparison to Standard Technical Specifications (STS)

Because coolant chemistry requirements related to conductivity and chloride do not meet the criteria of 10CFR50.36, NUREG 1433, Revision 1, "Standard Technical Specifications General Electric Plants, BWR/4," dated April 7, 1995, does not contain reactor coolant chemistry limits for conductivity and chlorides.

SAFETY ASSESSMENT

The reactor coolant chemistry requirements contained in current TS 3/4.6.B.2, 3/4.6.B.3, and 3.6.B.4 will be relocated to the Technical Requirements Manual. In addition, TS 3.6.B.5 as applicable to these provisions will be repeated in the TRM. Any future changes to these requirements will be controlled by the 10CFR50.59 process, and any identified unreviewed safety questions would require prior NRC review and approval.

The NRC's regulatory requirements related to the content of TS are set forth in 10CFR50.36. In promulgating this rule, NRC determined that the purpose of the TS is to impose only those conditions or limitations upon reactor operations necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. TS that do not meet the screening criteria for retention as TS may be relocated to another licensee controlled document. The four criteria defined in 10CFR50.36 are applied to the current TS for reactor coolant chemistry parameters as follows:

Criterion 1: *Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.*

The reactor coolant chemistry parameters of conductivity and chloride are not used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. The current TS provide limits on particular chemical properties and surveillance requirements to monitor these properties to ensure that degradation of the reactor coolant pressure boundary is not exacerbated by poor chemistry. However, degradation of the reactor coolant pressure boundary is a long-term process. Other regulations and TS provide direct means to monitor and correct the degradation of the reactor coolant pressure boundary; for example, inservice inspection and primary coolant leakage limits.

Criterion 2: *A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.*

The chemistry parameters of conductivity and chloride content are not used as an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 3: *A structure, system, or component (SSC) that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.*

The coolant chemistry parameters of conductivity and chloride concentration are not SSCs used as part of the primary success path and do not function or actuate to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 4: *A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.*

Operating experience or probabilistic safety assessments have not shown reactor coolant chemistry parameters of conductivity and chloride content to be significant to public health and safety.

The relocation of these TS from 3/4.6.B to the TRM will continue to provide adequate assurance that conductivity limits and chloride concentrations will continue to be met, monitored and acted upon as appropriate. The proposed change is consistent with NUREG-1433, Rev. 1, "Standard Technical Specifications, General Electric Plants, BWR/4."

Because of the relocation of the above TS sections, it is desirable to renumber remaining TS 3.6.B.5 to "3.6.B.2." Other minor formatting changes are being made to correct administrative errors. These are administrative changes made to provide a consistent TS format and do not involve the change to any technical requirements.

In summary, the relocated requirements do not meet the criteria of 10CFR50.36 for retention in TS and are not required to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. Following relocation to the TRM, the provisions of 10CFR50.59 will provide adequate regulatory control over any future changes to these coolant chemistry requirements.

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Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 234

Reactor Coolant Chemistry – Conductivity and Chlorides

Determination of No Significant Hazards Consideration

Determination of No Significant Hazards Consideration

Description of amendment request:

This proposed change relocates those portions of Technical Specifications (TS) related to reactor coolant conductivity and chloride requirements to the Technical Requirements Manual. The proposed change simplifies the TS, meets regulatory requirements for relocated TS, and conforms to the criteria of 10CFR50.36. The Specifications for reactor coolant conductivity and chloride content do not meet the screening criteria of 10CFR50.36 for retention in the TS, as reflected in NUREG-1433, Rev. 1, "Standard Technical Specifications, General Electric Plants, BWR/4."

The relocation of requirements from the Technical Specifications to the Technical Requirements Manual is administrative in nature. The reactor coolant chemistry requirements related to conductivity and chloride content are unchanged as a result of this action. Future changes to these requirements will be controlled by 10CFR50.59.

Basis for no significant hazards determination:

Pursuant to 10CFR50.92, Vermont Yankee (VY) has reviewed the proposed change and concludes that the change does not involve a significant hazards consideration since the proposed change satisfies the criteria in 10CFR50.92(c).

1. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change is administrative in nature and does not involve the modification of any plant equipment or affect basic plant operation. Conductivity and chloride limits are not assumed to be an initiator of any analyzed event, nor are these limits assumed in the mitigation of consequences of accidents.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed change does not involve any physical alteration of plant equipment and does not change the method by which any safety-related system performs its function. As such, no new or different types of equipment will be installed, and the basic operation of installed equipment is unchanged. The methods governing plant operation and testing remain consistent with current safety analysis assumptions. Therefore, the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. <u>The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment will not involve a significant reduction in a margin of safety.</u>

The proposed change represents the relocation of current Technical Specification requirements to the Technical Requirements Manual, based on regulatory guidance and previously approved changes for other stations. The proposed change is administrative in nature, does not negate any existing requirement, and does not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. As such, there are no changes being made to safety analysis assumptions, safety limits or safety system settings that would adversely affect plant safety as a result of the proposed change. Margins of safety are unaffected by requirements that are retained, but relocated from the Technical Specifications to the Technical Requirements Manual.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

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Attachment 3

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 234

Reactor Coolant Chemistry – Conductivity and Chlorides

Marked-up Version of the Current Technical Specifications

3.6 LIMITING CONDITIONS FOR OPERATION

2. The reactor coolant water shall not exceed the following limits with steaming rates less than 100,000 pounds per hour except as specified in Specification 3.6.B.3:

Conductivity	5umho/cm
Chloride ion	0.1 ppm

3. For reactor startups the maximum value for conductivity shall not exceed 10 umho/cm and the maximum value for chloride ion concentration shall not exceed 0.1 ppm, in the reactor coolant water for the first 24 hours after placing the reactor in the power operating condition.

4.6 SURVEILLANCE REQUIREMENTS

e. With the radioiodine concentration in the reactor coolant greater than 1.1 microcuries/gram dose equivalent I-131, a sample of reactor coolant shall be taken every 4 hours and analyzed for radioactive iodines of I-131 through I-135, until the specific activity of the reactor coolant is restored below 1.1 microcuries/gram dose equivalent I-131.

2. During startups and at steaming rates below 100,000 pounds per hour, a sample of reactor coolant shall be taken every four hours and analyzed for conductivity and chloride content.

3. a. With steaming rates greater than or equal to 100,000 pounds per hour, a reactor coolant sample shall be taken at least every 96 hours and when the continuous conductivity monitors indicate abnormal conductivity (other than short-term spikes), and analyzed for conductivity and chloride ion content.

3.6 LIMITING CONDITIONS FOR OPERATION

4. Except as specified in Specification 3.6.B.3 above, the reactor coolant water shall not exceed the following limits with steaming rates greater than or equal to 100,000 pounds per hours.

Conductivity	5 uhmo/cm
Chloride ion	0.5 ppm

5. If Specification 3.6.B is not met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

C. Coolant Leakage

1.a. Any time irradiated fuel is in the reactor vessel and reactor coolant temperature is above 212°F, reactor coolant leakage into the primary containment from unidentified sources shall not exceed 5 gpm. In addition, the total reactor coolant system leakage into the primary containment shall not exceed 25 gpm.

b. While in the run mode, reactor coolant leakage into the primary containment from unidentified sources shall not

4.6 SURVEILLANCE REQUIREMENTS

b. When the continuous conductivity monitor is inoperable, a reactor coolant sample shall be taken every four hours and analyzed for conductivity and chloride ion content.

C. Coolant Leakage

1. Reactor coolant system leakage, for the purpose of satisfying Specification 3.6.C.1, shall be checked and logged once per shift, not to exceed 12 hours.

BASES: 3.6 and 4.6 (Cont'd)

Whenever an isotopic analysis is performed, a reasonable effort will be made to determine a significant percentage of those contributors representing the total radioactivity in the reactor coolant sample. Usually at least 80 percent of the total gamma radioactivity can be identified by the isotopic analysis.

It has been observed that radioiodine concentration can change rapidly in the reactor coolant during transient reactor operations, such as reactor shutdown, reactor power changes, and reactor startup if failed fuel is present. As specified, additional reactor coolant samples shall be taken and analyzed for reactor operations in which steady-state radioiodine concentrations in the reactor coolant indicate various levels of iodine releases from the fuel. Since the radioiodine concentration in the reactor coolant is not continuously measured, reactor coolant sampling would be ineffective as a means to rapidly detect gross fuel element failures. However, some capability to detect gross fuel element failures is inherent in the radiation monitors in the off-gas system on the main steam line.

Materials in the primary system are primarily 304 stainless steel and Zircaloy. The reactor water chemistry limits are established to prevent damage to these materials. The limit placed on chloride concentration is to prevent stress corrosion cracking of the stainless steel.

When conductivity is in its proper normal range (approximately 10 µmho/cm during reactor startup and 5 µmho/cm during power operation), pH and chloride and other impurities affecting conductivity must also be within their normal range. When and if conductivity becomes abnormal, then chloride measurements are made to determine whether or not they are also out of their normal operating values. This would not necessarily be the case. Conductivity could be high due to the presence of a neutral salt, e.g., Na_2SO_4, which would not have an effect on pH or chloride. In such a case, high conductivity alone is not a cause for shutdown. In some types of water-cooled reactors, conductivities are in fact high due to purposeful addition of additives. In the case of BWRs, however, no additives are used and where neutral pH is maintained, conductivity provides a very good measure of the quality of the reactor water. Significant changes therein provide the operator with a warning mechanism so he can investigate and remedy the condition causing the change before limiting conditions, with respect to variables affecting the boundaries of the reactor coolant, are exceeded. Methods available to the operator for correcting the off-standard condition include operation of the reactor cleanup system reducing the input of impurities and placing the reactor in the cold shutdown condition. The major benefit of cold shutdown is to reduce the temperature dependent corrosion rates and provide time for the cleanup system to reestablish the purity of the reactor coolant. During startup periods, which are in the category of less than 100,000 pounds per hour, conductivity may exceed 5 µmho/cm because of the initial evolution of gases and the initial addition of dissolved metals. During this period of time when the conductivity exceed 5 µmho (other than short term spikes), samples will be taken to assure the chloride concentration is less than 0.1 ppm.

The conductivity of the reactor coolant is continuously monitored. The samples of the coolant which are taken every 96 hours will serve as a reference for calibration of these monitors and is considered adequate to assure accurate readings of the monitors. If conductivity is within its normal range, chlorides and other

BASES: 3.6 and 4.6 (Cont'd)

impurities will also be within their normal ranges. The reactor cooling samples will also be used to determine the chlorides. Therefore, the sampling frequency is considered adequate to detect long-term changes in the chloride ion content. Isotopic analyses required by Specification 4.6.B.1.b may be performed by a gamma scan and gross beta and alpha determination.

The conductivity of the feedwater is continuously monitored and alarm set points consistent with Regulatory requirements given in Regulatory Guide 1.56, "Maintenance of Water Purity in Boiling Water Reactors," have been determined. The results from the conductivity monitors on the feedwater can be correlated with the results from the conductivity monitors on the reactor coolant water to indicate demineralizer breakthrough and subsequent conductivity levels in the reactor vessel water.

C. Coolant Leakage

The 5 gpm limit for unidentified leaks was established assuming such leakage was coming from the reactor coolant system. Tests have been conducted which demonstrate that a relationship exists between the size of a crack and the probability that the crack will propagate. These tests suggest that for leakage somewhat greater than the limit specified for unidentified leakage, the probability is small that imperfections or cracks associated with such leakage would grow rapidly. Leakage less than the limit specified can be detected within a few hours utilizing the available leakage detection systems. If the limit is exceeded and the origin cannot be determined in a reasonably short time the plant should be shutdown to allow further investigation and corrective action.

The 2 gpm increase limit in any 24 hour period for unidentified leaks was established as an additional requirement to the 5 gpm limit by Generic Letter 88-01, "NRC Position on Intergranular Stress Corrosion Cracking (IGSCC) in BWR Austenitic Stainless Steel Piping."

The removal capacity from the drywell floor drain sump and the ~~equivalent~~ equipment drain sump is 50 gpm each. Removal of 50 gpm from either of these sumps can be accomplished with considerable margin.

D. Safety and Relief Valves

Safety analyses have shown that only three of the four relief valves are required to provide the recommended pressure margin of 25 psi below the safety valve actuation settings as well as compliance with the MCPR safety limit for the limiting anticipated overpressure transient. For the purposes of this limiting condition, a relief valve that is unable to actuate within tolerance of its set pressure is considered to be as inoperable as a mechanically malfunctioning valve.

The setpoint tolerance value for as-left or refurbished valves is specified in Section III of the ASME Boiler and Pressure Vessel Code as ±1% of set pressure. However, the code allows a larger tolerance value for the as-found condition if the supporting design analyses demonstrate that the applicable acceptance criteria are met. Safety analysis has been performed which shows that with all safety and safety relief valves within ±3% of the specified set pressures in Table 2.2.1 and with one inoperable safety relief valve, the reactor coolant pressure safety limit of 1375 psig and the MCPR safety limit are not exceeded during the limiting overpressure transient.

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Attachment 4

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 234

Reactor Coolant Chemistry – Conductivity and Chlorides

Retyped Technical Specification Pages

Listing of Affected Technical Specifications Pages

Replace the Vermont Yankee Nuclear Power Station Technical Specifications pages listed below with the revised pages. The revised pages contain vertical lines in the margin indicating the areas of change.

Remove	Insert
118	118
119	119
119a*	---
141	141
142	142

* - Note, existing page 119a is being re-numbered as page 119. No other changes are being made to page 119a.

3.6 LIMITING CONDITIONS FOR OPERATION

2. If Specification 3.6.B is not met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

C. Coolant Leakage

1.a. Any time irradiated fuel is in the reactor vessel and reactor coolant temperature is above 212°F, reactor coolant leakage into the primary containment from unidentified sources shall not exceed 5 gpm. In addition, the total reactor coolant system leakage into the primary containment shall not exceed 25 gpm.

b. While in the run mode, reactor coolant leakage into the primary containment from unidentified sources shall not

4.6 SURVEILLANCE REQUIREMENTS

e. With the radioiodine concentration in the reactor coolant greater than 1.1 microcuries/gram dose equivalent I-131, a sample of reactor coolant shall be taken every 4 hours and analyzed for radioactive iodines of I-131 through I-135, until the specific activity of the reactor coolant is restored below 1.1 microcuries/gram dose equivalent I-131.

C. Coolant Leakage

1. Reactor coolant system leakage, for the purpose of satisfying Specification 3.6.C.1, shall be checked and logged once per shift, not to exceed 12 hours.

3.6 LIMITING CONDITIONS FOR OPERATION

increase by more than 2 gpm within any 24 hour period.

2. Both the sump and air sampling systems shall be operable during power operation. From and after the date that one of these systems is made or found inoperable for any reason, reactor operation is permissible only during succeeding seven days.

3. If these conditions cannot be met, initiate an orderly shutdown and the reactor shall be in the cold shutdown condition within 24 hours.

4.6 SURVEILLANCE REQUIREMENTS

BASES: 3.6 and 4.6 (Cont'd)

Whenever an isotopic analysis is performed, a reasonable effort will be made to determine a significant percentage of those contributors representing the total radioactivity in the reactor coolant sample. Usually at least 80 percent of the total gamma radioactivity can be identified by the isotopic analysis.

It has been observed that radioiodine concentration can change rapidly in the reactor coolant during transient reactor operations, such as reactor shutdown, reactor power changes, and reactor startup if failed fuel is present. As specified, additional reactor coolant samples shall be taken and analyzed for reactor operations in which steady-state radioiodine concentrations in the reactor coolant indicate various levels of iodine releases from the fuel. Since the radioiodine concentration in the reactor coolant is not continuously measured, reactor coolant sampling would be ineffective as a means to rapidly detect gross fuel element failures. However, some capability to detect gross fuel element failures is inherent in the radiation monitors in the off-gas system on the main steam line.

Isotopic analyses required by Specification 4.6.B.1.b may be performed by a gamma scan and gross beta and alpha determination.

BASES: 3.6 and 4.6 (Cont'd)

C. Coolant Leakage

The 5 gpm limit for unidentified leaks was established assuming such leakage was coming from the reactor coolant system. Tests have been conducted which demonstrate that a relationship exists between the size of a crack and the probability that the crack will propagate. These tests suggest that for leakage somewhat greater than the limit specified for unidentified leakage, the probability is small that imperfections or cracks associated with such leakage would grow rapidly. Leakage less than the limit specified can be detected within a few hours utilizing the available leakage detection systems. If the limit is exceeded and the origin cannot be determined in a reasonably short time the plant should be shutdown to allow further investigation and corrective action.

The 2 gpm increase limit in any 24 hour period for unidentified leaks was established as an additional requirement to the 5 gpm limit by Generic Letter 88-01, "NRC Position on Intergranular Stress Corrosion Cracking (IGSCC) in BWR Austenitic Stainless Steel Piping."

The removal capacity from the drywell floor drain sump and the equipment drain sump is 50 gpm each. Removal of 50 gpm from either of these sumps can be accomplished with considerable margin.

D. Safety and Relief Valves

Safety analyses have shown that only three of the four relief valves are required to provide the recommended pressure margin of 25 psi below the safety valve actuation settings as well as compliance with the MCPR safety limit for the limiting anticipated overpressure transient. For the purposes of this limiting condition, a relief valve that is unable to actuate within tolerance of its set pressure is considered to be as inoperable as a mechanically malfunctioning valve.

The setpoint tolerance value for as-left or refurbished valves is specified in Section III of the ASME Boiler and Pressure Vessel Code as ±1% of set pressure. However, the code allows a larger tolerance value for the as-found condition if the supporting design analyses demonstrate that the applicable acceptance criteria are met. Safety analysis has been performed which shows that with all safety and safety relief valves within ±3% of the specified set pressures in Table 2.2.1 and with one inoperable safety relief valve, the reactor coolant pressure safety limit of 1375 psig and the MCPR safety limit are not exceeded during the limiting overpressure transient.