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RS-14-080

10 CFR 50.90

March 18, 2014

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

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: License Amendment Request for Adoption of Technical Specification Task Force (TSTF)-513, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation"

In accordance with the provisions of 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC, (EGC), is submitting a request for amendments to Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, and Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2.

The proposed amendment would revise Technical Specifications (TS) 3.4.15, "RCS Leakage Detection Instrumentation," to define a new time limit for restoring inoperable Reactor Coolant System (RCS) leakage detection instrumentation to operable status; establish alternate methods of monitoring RCS leakage when one or more required monitors are inoperable; and make TS Bases changes which reflect the proposed changes and more accurately reflect the contents of the facility design basis related to operability of the RCS leakage detection instrumentation. The changes are consistent with NRC-approved Revision 3 to Technical Specification Task Force (TSTF) Improved Standard Technical Specification (STS) Change Traveler TSTF-513, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation." The availability of this TS improvement was announced in the Federal Register on January 3, 2011 (76 FR 189) as part of the consolidated line item improvement process (CLIIP).

Consistent with the TSTF, the proposed amendment would add the containment atmosphere gaseous radioactivity monitor back into TS 3.4.15. This component was previously removed

with Amendment 140 to Byron Station and Amendment 133 to Braidwood Station (ML043550025). This attached amendment request is subdivided as follows:

- Attachment 1 provides an evaluation of the proposed changes.
- Attachments 2 and 3 provide the marked-up TS pages for Braidwood Station and Byron Station, respectively, with the proposed changes indicated.
- Attachments 4 and 5 provide the marked-up TS Bases pages for Braidwood Station and Byron Station, respectively, with the proposed changes indicated. The TS Bases pages are provided for information only and do not require NRC approval.

The proposed change has been reviewed by the Braidwood Station and Byron Station Plant Operations Review Committees and approved by their respective Nuclear Safety Review Boards in accordance with the requirements of the EGC Quality Assurance Program.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the State of Illinois of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

EGC requests approval of the proposed license amendment by March 18, 2015. Once approved, the amendment will be implemented within 60 days.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Jessica Krejcie at (630) 657-2816.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 18th day of March 2014.

Respectfully,

David M. Gullott
Manager – Licensing
Exelon Generation Company, LLC

Attachments:
1. Evaluation of Proposed Changes
2. Proposed Technical Specifications Changes for Braidwood Station, Units 1 and 2
3. Proposed Technical Specifications Changes for Byron Station, Units 1 and 2
4. Proposed Technical Specifications Bases Changes for Braidwood Station, Units 1 and 2
5. Proposed Technical Specifications Bases Changes for Byron Station, Units 1 and 2

cc: NRC Regional Administrator – Region III
NRC Senior Resident Inspector – Braidwood Station
NRC Senior Resident Inspector – Byron Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1

EVALUATION OF PROPOSED CHANGES

Subject: License Amendment Request for Adoption of TSTF-513, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation"

ATTACHMENT 1

EVALUATION OF PROPOSED CHANGES

License Amendment Request for Adoption of TSTF-513, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation"

1.0 DESCRIPTION

The proposed amendment would revise the Technical Specifications (TS) to define a new time limit for restoring inoperable Reactor Coolant System (RCS) leakage detection instrumentation to operable status; establish alternate methods of monitoring RCS leakage when one or more required monitors are inoperable; and make conforming TS Bases changes. These changes are consistent with NRC-approved Revision 3 to Technical Specification Task Force (TSTF) Standard Technical Specification (STS) Change Traveler TSTF-513, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation." The availability of this TS improvement was announced in the *Federal Register* on January 3, 2011 (76 FR 189) as part of the consolidated line item improvement process (CLIIP). Consistent with the TSTF, the proposed amendment adds the containment atmosphere gaseous radioactivity monitor back into TS 3.4.15 and Surveillance Requirements (SR) 3.4.15.1, 3.4.15.2 and 3.4.15.4. This component was previously removed with Amendment 140 to Byron Station and Amendment 133 to Braidwood Station (ML043550025).

2.0 PROPOSED CHANGES

The proposed amendment adds back the containment atmospheric gaseous monitor to TS LCO 3.4.15. The revised TS LCO 3.4.15 defines that for considering RCS leakage detection instrumentation OPERABLE, in addition to one containment sump monitor, one containment atmosphere radioactivity monitor (gaseous or particulate) is required to be operable. The gaseous monitor was previously removed from the TS 3.4.15 required monitors for containment atmosphere radioactivity monitors, however, industry experience has shown that the containment atmosphere gaseous radioactivity monitor is useful to detect an increase in RCS leak rate and provides a diverse means to confirm an RCS leak exists when other monitors detect an increase in RCS leak rate. SRs 3.4.15.1, 3.4.15.2 and 3.4.15.4 have also been updated to reflect the addition of the containment atmosphere gaseous monitor back into TS 3.4.15.

The proposed changes are consistent with TSTF-513, Revision 3 and include adding a new Condition C to TS 3.4.15, "RCS Leakage Detection Instrumentation," and revising the associated bases. New Condition C is applicable when the containment atmosphere gaseous radioactivity monitor is the only operable TS-required monitor (i.e., all other monitors are inoperable). New Condition C Required Actions require analyzing grab samples of the containment atmosphere every 12 hours and restoring another monitor within 7 days. Additionally, the TS Bases, which summarize the reasons for the specifications, are revised to clarify the specified safety function for each required instrument in the limiting condition for operation (LCO) Bases, delete discussion from the Bases that could be construed to alter the meaning of TS operability requirements, and reflect the changes made to TS 3.4.15.

Exelon Generation Company, LLC (EGC) is not proposing variations or deviations from the TS or TS Bases changes described in TSTF-513, Revision 3, or the NRC staff's model safety evaluation (SE) published in the *Federal Register* on January 3, 2011 (76 FR 189) as part of the CLIIP Notice of Availability.

3.0 BACKGROUND

NRC Information Notice (IN) 2005-24, "Nonconservatism in Leakage Detection Sensitivity," dated August 3, 2005, informed addressees that the reactor coolant activity assumptions for primary containment atmosphere gaseous radioactivity monitors may be non-conservative. This means the monitors may not be able to detect a 1.0 gpm leak within one hour. Some licensees, including Byron Station and Braidwood Station, have taken action in response to IN 2005-24 to remove the gaseous radioactivity monitor from the TS list of required monitors. Byron and Braidwood Stations previously removed the containment atmosphere gaseous radioactivity monitor from TS 3.4.15 with Amendment 140 to Byron Station and Amendment 133 to Braidwood Station (ML043550025). However, industry experience has shown that the primary containment atmosphere gaseous radioactivity monitor is often the first monitor to indicate an increase in RCS leak rate. As a result, the TSTF and the NRC staff met on April 29, 2008, and April 14, 2009, to develop an alternative approach to address the issue identified in IN 2005-24. The agreed solution was to retain the primary containment atmosphere gaseous radioactivity monitor in the LCO list of required equipment, revise the specified safety function of the gas monitor to specify the required instrument sensitivity level, revise the Actions to require additional monitoring, and provide less time before a plant shutdown is required when the primary containment atmosphere gaseous radioactivity monitor is the only operable monitor. Therefore, in order to follow the TSTF proposed solution to address the non-conservatism in Leakage Detection Sensitivity, Byron and Braidwood Station have determined it appropriate to revise the TS to include the containment atmosphere gaseous radioactivity monitor in TS 3.4.15.

4.0 TECHNICAL ANALYSIS

EGC has reviewed TSTF-513, Revision 3, and the model SE published on January 3, 2011 (76 FR 189) as part of the CLIIP Notice of Availability. EGC has concluded that the technical bases presented in TSTF Traveler-513, Revision 3, and the model SE prepared by the NRC staff are applicable to Braidwood and Byron Stations when the containment atmosphere gaseous radioactivity monitor is included in TS 3.4.15 as proposed.

As indicated above, EGC is proposing to revise TS 3.4.15 to add back the containment atmosphere gaseous radioactivity monitor. The gaseous channel of the containment atmosphere radioactivity monitor has been maintained functional and available in accordance with normal non-TS equipment practices. Therefore, the proposed change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed). Additionally, the associated SRs (3.4.15.1, 3.4.15.2 and 3.4.15.4) are revised to indicate the application of the SR to the required atmosphere radioactivity monitor (i.e., gaseous or particulate).

The TS Bases are being revised consistent with the TSTF-513 Revision 3 to describe when the gaseous and particulate containment atmosphere radioactivity monitors are operable. The proposed amendment requires additional batch (i.e., grab sample) or manual RCS leakage monitoring to be performed when the primary containment atmosphere gaseous radioactivity

monitor is the only operable continuous or automatic monitor. These alternative batch methods provide an RCS leakage detection capability similar to the TS-required methods. The grab sample has an RCS leakage detection capability that is comparable to that of the containment particulate radioactivity monitor. The proposed Actions and Completion Times for grab samples are adequate because use of frequent grab samples provides additional assurance (in addition to mass balances required by Conditions A and B) that any significant RCS leakage will be detected prior to significant Reactor Coolant Pressure Boundary (RCPB) degradation.

Compliance with General Design Criterion (GDC) 30, "Quality of Reactor Coolant Pressure Boundary"

Byron and Braidwood Stations' compliance with GDC 30 is discussed in the Updated Final Safety Analysis Report (UFSAR) Section 3.1.2.4.1, "Evaluation Against Criterion 30 - Quality of Reactor Coolant Pressure Boundary."

With respect to RCS leakage detection, UFSAR Section 3.1.2.4.1 states the following:

"Leakage is detected by an increase in the amount of makeup water required to maintain a normal level in the pressurizer. The reactor vessel closure joint is provided with a temperature monitored leak off between double gaskets. Leakage inside the reactor containment is drained to the reactor containment sump where it is monitored. Leakage is also detected by measuring the airborne activity in the reactor containment. Containment dry-bulb temperatures and pressure also provide indirect indication of leakage to the containment.

The reactor coolant pressure boundary leakage detection system is described in [UFSAR] Subsection 5.2.5."

The proposed revision to the TS Bases states that the gaseous or particulate containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting 1.0 gpm of unidentified LEAKAGE within one hour given an RCS activity equivalent to that assumed in the design calculation (i.e., UFSAR Table 11.1-4, "Realistic, Operational Basis Reactor Coolant Fission and Corrosion Product Activities") for the monitors. Recently measured RCS activities are significantly lower than those identified in UFSAR Table 11.1-4, and it is acknowledged in the current TS Bases that actual setpoints for the particulate monitor are set as low as practical, considering the actual concentration of radioactivity in the RCS and the containment background radioactivity concentration. With lower RCS activity levels, a 1.0 gpm leak becomes more difficult to detect using the containment atmosphere particulate or gaseous radioactivity monitor. However, at elevated RCS activity or failed fuel conditions, a 1.0 gpm leak would be detectable within one hour. Byron and Braidwood Stations have confirmed that for the RCS activity equivalent assumed in the design calculations (i.e., those identified in UFSAR Table 11.1-4), both the gaseous and particulate monitor are capable of detecting 1.0 gpm of unidentified leakage within one hour. Additionally, the detector sensitivity for Braidwood Station and Byron Station meets that defined in RG 1.45. For the air particulate monitoring the instrument sensitivity is 1.0E-9 μCi/cc or greater and for the radiogas monitoring the instrument sensitivity is 1.0E-6 μCi/cc.

Byron and Braidwood Stations' UFSAR Section 5.2.5, "Detection of Leakage Through Reactor Coolant Pressure Boundary," contains a detailed discussion of the leakage detection systems, including the Leak-Before-Break (LBB) analysis. The section describes the means for detecting and monitoring leakage of reactor coolant to the containment area. The basic concept of LBB is that certain piping material has sufficient fracture toughness (i.e., ductility) to resist rapid flaw propagation. A postulated flaw in such piping would not lead to pipe rupture and potential damage to adjacent safety related systems, structures or components before the plant could be placed in a safe, shutdown condition. Before pipe rupture, the postulated flaw would lead to limited but detectable leakage which would be identified by the leak detection systems in time for the operator to take action. The LBB analysis for Byron and Braidwood Stations was reviewed and approved by the NRC and validated that appropriate safety margins are satisfied to assure the structural adequacy of the pipe (Reference 3). Standard Review Plan (SRP) Section 3.6.3, "Leak-Before-Break Evaluation Procedures," specifies a margin of the square-root of 2 be applied to the loads to assure that leakage-size flaws are stable at the normal load plus safe-shutdown earthquake load. A margin of ten is applied to leakage so that detection of leakage from postulated flaw size is ensured when the pipe is subjected to normal operational loads. In addition, the critical flaw size should be twice as large as the leakage flaw size (i.e., a margin of two on leakage flaw size). The proposed actions for inoperable RCS leakage detection instrumentation maintain sufficient continuity and diversity of RCS leakage detection capability that an extremely low probability of undetected RCS leakage leading to pipe rupture is maintained.

In the NRC approved Safety Evaluation for the LBB analysis for Byron and Braidwood Stations, the NRC acknowledged that the installed RCS leakage detection systems met the intent of RG 1.45 such that leakage of 1.0 gpm in one hour can be detected. This criteria continues to be met by the containment sump monitor at all times. This criterion is met by the particulate and gaseous monitor given an RCS activity equivalent to that assumed in the design calculations (i.e., UFSAR Table 11.1-4) for the monitors as described above.

5.0 REGULATORY SAFETY ANALYSIS

5.1 NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

EGC has evaluated the proposed changes to the TS using the criteria in 10 CFR 50.92 and has determined that the proposed changes do not involve a significant hazards consideration. An analysis of the issue of no significant hazards consideration is presented below:

Description of Amendment Request: The proposed amendment would revise TS 3.4.15, "Reactor Coolant System (RCS) Leakage Detection Instrumentation," Conditions and Required Actions and the licensing basis for the gaseous radioactivity monitor, as well as make associated TS Bases changes for TS 3.4.15.

Basis for proposed no significant hazards consideration determination: As required by 10 CFR 50.91(a), EGC's analysis of the issue of no significant hazards consideration using the standards in 10 CFR 50.92 is presented below:

ATTACHMENT 1

EVALUATION OF PROPOSED CHANGES

License Amendment Request for Adoption of TSTF-513, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation"

1. Does the Proposed Change Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated?

   Response: No

   The proposed change clarifies the operability requirements for the RCS leakage detection instrumentation, and prescribes the time allowed for the plant to operate when the only TS-required operable RCS leakage detection instrumentation monitor is the containment atmosphere gaseous radioactivity monitor. The monitoring of RCS leakage is not a precursor to any accident previously evaluated. The monitoring of RCS leakage is not used to mitigate the consequences of any accident previously evaluated. Therefore, it is concluded that the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the Proposed Change Create the Possibility of a New or Different Kind of Accident from any Accident Previously Evaluated?

   Response: No

   The proposed change clarifies the operability requirements for the RCS leakage detection instrumentation and prescribes the time allowed for the plant to operate when the only TS-required operable RCS leakage detection instrumentation monitor is the containment atmosphere gaseous radioactivity monitor. The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The proposed change maintains sufficient continuity and diversity of leak detection capability that the probability of piping evaluated and approved for Leak-Before-Break progressing to pipe rupture remains extremely low. Therefore, it is concluded that the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the Proposed Change Involve a Significant Reduction in a Margin of Safety?

   Response: No

   The proposed change reintroduces the containment atmosphere gaseous radioactivity monitor as an option for meeting the operability requirement for TS 3.4.15 LCO, clarifies the operability requirements for the RCS leakage detection instrumentation and prescribes the time allowed for the plant to operate when the only TS-required operable RCS leakage detection instrumentation monitor is the containment atmosphere gaseous radiation monitor.

   The proposed change reintroduces the containment atmosphere gaseous radioactivity monitor as an option for meeting the operability requirement for TS 3.4.15 LCO, since industry experience has shown that the containment atmosphere gaseous radiation monitor is useful to detect an increase in RCS leak rate and provides a diverse means to confirm an RCS leak exists when other monitors detect an increase in RCS leak rate.

The amount of time the plant is allowed to operate with only the containment atmosphere gaseous radioactivity monitor operable does not result in a reduction in the margin of safety since an increase in RCS leakage will be detected before it potentially results in a gross failure. Therefore, it is concluded that the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above analysis, EGC concludes that the requested change does not involve a significant hazards consideration, as set forth in 10 CFR 50.92(c), "Issuance of Amendment."

5.2 APPLICABLE REGULATORY REQUIREMENTS/CRITERIA

A description of the proposed TS change and its relationship to applicable regulatory requirements were published in the *Federal Register* Notice of Availability on January 3, 2011 (76 FR 189). EGC has reviewed the NRC staff's model SE referenced in the CLIIP Notice of Availability and concluded that the regulatory evaluation section is applicable to Braidwood and Byron Stations.

6.0 ENVIRONMENTAL CONSIDERATION

The proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, and would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

7.0 REFERENCES

1. Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Change Traveler, TSTF-513-A, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation" dated January 3, 2011 (ADAMS Accession Number ML102360355)

2. Byron License Amendment No.140 and Braidwood License Amendment No.133 - Letter from G. F. Dick (NRC) to C. Crane (Exelon Generation Company), "Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 – Issuance of Amendments Re: Reactor Coolant System Leakage Detection Instrumentation (TAC Nos. MC0509, MC0510, MC0507 and MC0508)" dated January 14, 2005 (ADAMS Accession Number ML043550025)

3. Letter from R. R. Assa (NRC) to I. Johnson (Commonwealth Edison Company (now EGC)), "Safety Evaluation (SE) Regarding Leak-Before-Break Analysis — Byron Station, Units 1

and 2, and Braidwood Station, Units 1 and 2 (TAC Nos. M95342, M95343, M95344 and M95345)," dated October 25, 1996 (ADAMS Accession Number 9610290229)

ATTACHMENT 2

Proposed Technical Specifications Changes for Braidwood Station, Units 1 and 2

Braidwood Station, Units 1 and 2

Facility Operating License Nos. NPF-72 and NPF-77

Mark-up of Technical Specifications Page

3.4.15 – 1
3.4.15 – 2
3.4.15 – 3
INSERT PAGE

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor; and

b. One containment atmosphere ~~particulate~~ radioactivity monitor. (gaseous or particulate)

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Required containment sump monitor inoperable.	A.1	---------NOTE-------- Not required to be performed until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	A.2	Restore required containment sump monitor to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ~~C~~ Required ~~Containment~~ atmosphere ~~particulate~~ radioactivity monitor inoperable.	B.1.1	Analyze grab samples of the containment atmosphere.	Once per 24 hours
	OR		
	B.1.2	---------NOTE--------- Not required to be performed until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1. required	Once per 24 hours
	AND		
	B.2	Restore containment atmosphere ~~particulate~~ radioactivity monitor to OPERABLE status.	30 days
~~C~~. Required Action and associated Completion Time not met. D	~~C~~.1 D	Be in MODE 3.	6 hours
	AND		
	~~C~~.2 D	Be in MODE 5.	36 hours
~~D~~. All required monitors inoperable. E	~~D~~.1 E	Enter LCO 3.0.3.	Immediately

INSERT NEW CONDITION C (see INSERT A)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere ~~particulate~~ radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform COT of the required containment atmosphere ~~particulate~~ radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere ~~particulate~~ radioactivity monitor.	In accordance with the Surveillance Frequency Control Program

INSERT A

CONDITION	REQUIRED ACTION		COMPLETION TIME
---------NOTE--------- Only applicable when the containment atmosphere gaseous radioactivity monitor is the only OPERABLE monitor. ----------	C.1	Analyze grab samples of the containment atmosphere	Once per 12 hours
	AND		
C. Required containment sump monitor inoperable.	C.2	Restore required containment sump monitor to OPERABLE status.	7 days

ATTACHMENT 3

Proposed Technical Specifications Changes for Byron Station, Units 1 and 2

Byron Station, Units 1 and 2

Facility Operating License Nos. NPF-37 and NPF-66

Mark-up of Technical Specifications Page

3.4.15 – 1
3.4.15 – 2
3.4.15 – 3
INSERT PAGE

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor; and

b. One containment atmosphere ~~particulate~~ radioactivity monitor (gaseous or particulate)

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Required containment sump monitor inoperable.	A.1	---------NOTE-------- Not required to be performed until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	A.2	Restore required containment sump monitor to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ~~C~~ Containment atmosphere ~~particulate~~ radioactivity monitor inoperable.	B.1.1	Analyze grab samples of the containment atmosphere.	Once per 24 hours
	OR		
	B.1.2	---------NOTE--------- Not required to be performed until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	B.2	Restore containment atmosphere ~~particulate~~ radioactivity monitor to OPERABLE status.	30 days
~~C~~. Required Action and associated Completion Time not met.	~~C~~.1	Be in MODE 3.	6 hours
	AND		
	~~C~~.2	Be in MODE 5.	36 hours
~~D~~. All required monitors inoperable.	~~D~~.1	Enter LCO 3.0.3.	Immediately

Required

C

INSERT NEW CONDITION C (see INSERT A)

required

D

D

D

E

E

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the containment atmosphere ~~particulate~~ radioactivity monitor. required	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform COT of the containment atmosphere ~~particulate~~ radioactivity monitor. required	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump monitor. required	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the containment atmosphere ~~particulate~~ radioactivity monitor.	In accordance with the Surveillance Frequency Control Program

INSERT A

CONDITION	REQUIRED ACTION		COMPLETION TIME
---------NOTE-------- Only applicable when the containment atmosphere gaseous radioactivity monitor is the only OPERABLE monitor. ---------- C. Required containment sump monitor inoperable.	C.1	Analyze grab samples of the containment atmosphere	Once per 12 hours
	AND		
	C.2	Restore required containment sump monitor to OPERABLE status.	7 days

ATTACHMENT 4

Proposed Technical Specifications Bases Changes for Braidwood Station, Units 1 and 2

Braidwood Station, Units 1 and 2

Facility Operating License Nos. NPF-72 and NPF-77

Mark-up of Technical Specifications Bases Pages

B 3.4.15 – 1
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B 3.4.15 – 6
B 3.4.15 – 7
B 3.4.15 – 8
B 3.4.15 – 9

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

GDC 30 of Appendix A to 10 CFR 50 (Ref. 1) requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide 1.45, Revision 0, (Ref. 2) describes acceptable methods for selecting leakage detection systems.

Leakage detection systems must have the capability to detect significant Reactor Coolant Pressure Boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE. In addition to meeting the OPERABILITY requirements, the monitors are typically set to provide the most sensitive response without causing an excessive number of spurious alarms.

~~Industry practice has shown that water flow changes of 0.5 to 1.0 gpm can be readily detected in contained volumes by monitoring changes in water level, in flow rate, or in the operating frequency of a pump.~~ The containment sump, used to collect unidentified LEAKAGE, is instrumented to identify leakages of 1.0 gpm within one hour. ~~This sensitivity is acceptable for detecting increases in unidentified LEAKAGE.~~

The reactor coolant contains radioactivity that, when released to the containment, ~~can~~ may be detected by radiation monitoring instrumentation. ~~An instrument sensitivity of 10^{-9} μCi/cc radioactivity for particulate monitoring is practical for leakage detection systems.~~ Radioactivity detection systems are~~is~~ included for monitoring both particulate and gaseous ~~activity~~ activities because of ~~its~~ their sensitivities~~y~~ and rapid responses to RCS LEAKAGE. ~~The detection of RCS leakage using radiation monitors depends on the concentration of radioactivity in the RCS.~~

Other indications may be used to detect an increase in unidentified LEAKAGE; however, they are not required to be OPERABLE by this LCO.

BASES

BACKGROUND (continued)

Air temperature and pressure monitoring methods may also be used to infer unidentified LEAKAGE to the containment. Containment temperature and pressure fluctuate slightly during unit operation, but a rise above the normally indicated range of values may indicate RCS leakage into the containment. The relevance of temperature and pressure measurements ~~are~~ is affected by containment free volume and, for temperature, detector location. Alarm signals from these instruments can be valuable in recognizing rapid and sizable leakage to the containment. Temperature and pressure monitors are not required by this LCO.

The above-mentioned LEAKAGE detection methods or systems differ in sensitivity and response time. Some of these systems could serve as early alarm systems signaling the operators that closer examination of other detection systems is necessary to determine the extent of any corrective action that may be required.

APPLICABLE SAFETY ANALYSES

The need to evaluate the severity of an alarm or an indication is important to the operators, and the ability to compare and verify with indications from other systems is necessary. ~~The system response times and sensitivities are described in the UFSAR (Ref. 3).~~

The safety significance of RCS LEAKAGE varies widely depending on its source, rate, and duration. Therefore, detecting and monitoring RCS LEAKAGE into the containment area is necessary. Quickly separating the identified LEAKAGE from the unidentified LEAKAGE provides quantitative information to the operators, allowing them to take corrective action should a leak occur detrimental to the safety of the plant and the public.

RCS leakage detection instrumentation satisfies Criterion 1 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

~~One method of protecting against large RCS leakage derives from the ability of instruments to rapidly detect extremely small leaks.~~ This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide ~~a high degree of~~ confidence that small amounts of unidentified LEAKAGE ~~extremely small leaks~~ are detected in time to allow actions to place the unit in a safe condition, when RCS LEAKAGE indicates possible RCPB degradation. The RCS leak detection instrumentation required by this TS supports the Leak-Before-Break licensing basis (Ref. 4).

~~The LCO is satisfied when monitors of diverse measurement means are available. Thus, the containment sump monitor, in combination with a particulate radioactivity monitor, provides an acceptable minimum.~~

This LCO requires two instruments to be OPERABLE.

The containment sump is used to collect unidentified LEAKAGE. The LCO requirements apply to the total amount of unidentified LEAKAGE collected in the sump. The containment floor drain sump flow monitor (RF008) and the reactor cavity sump flow monitor (RF010) are normally utilized to fulfill the containment sump monitor requirement. Alarms are provided to alert the operator of leakages of 1.0 gpm. When the alarm function is not capable of detecting 1.0 gpm of unidentified LEAKAGE within one hour, the containment floor drain sump flow indication may be periodically monitored to ensure the capability of detecting 1.0 gpm of unidentified LEAKAGE within one hour.

In lieu of the containment floor drain sump flow monitor (RF008), either containment sump level monitor (PC002 or PC003) can be used by monitoring a change in sump level over a period of time in such a manner as to ensure the capability of detecting 1.0 gpm of unidentified LEAKAGE within one hour.

The identification of unidentified LEAKAGE will be delayed by the time required for unidentified LEAKAGE to travel to the containment sump and it may take longer than one hour to detect unidentified LEAKAGE of 1.0 gpm, depending on the origin and magnitude of the LEAKAGE. This sensitivity is acceptable for containment sump monitor OPERABILITY.

~~For the containment atmosphere radioactivity monitor, the PR011A (particulate) monitor satisfies the LCO requirement. The monitor is capable of detecting a 1.0 gpm leak within one hour at the sensitivity recommended in Regulatory Guide~~

~~1.45 and using the expected RCS activities of UFSAR Table 11.1-4. The actual setpoints are set as low as practicable, considering the actual concentration of radioactivity in the RCS and the containment background radiation concentration.~~

The reactor coolant contains radioactivity that, when released to the containment, can be detected by the gaseous or particulate containment atmosphere radioactivity monitor. Only one of the two detectors is required to be OPERABLE. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE, but have recognized limitations. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. If there are few fuel element cladding defects and low levels of activation products, it may not be possible for the gaseous or particulate containment atmosphere radioactivity monitor to detect a 1.0 gpm increase within one hour during normal operation. However, the gaseous or particulate containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting a 1.0 gpm increase in unidentified LEAKAGE within one hour given an RCS activity equivalent to that assumed in the design calculations for the monitors (UFSAR Table 11.1-4).

The LCO is satisfied when monitors of diverse measurement means are available. Thus, the containment sump monitor, in combination with a gaseous or particulate radioactivity monitor, provides an acceptable minimum.

BASES

APPLICABILITY

Because of elevated RCS temperature and pressure in MODES 1, 2, 3, and 4, RCS leakage detection instrumentation is required to be OPERABLE.

In MODE 5 or 6, the temperature is to be ≤ 200°F and pressure is maintained low or at atmospheric pressure. Since the temperatures and pressures are far lower than those for MODES 1, 2, 3, and 4, the likelihood of leakage and crack propagation are much smaller. Therefore, the requirements of this LCO are not applicable in MODES 5 and 6.

ACTIONS

A.1 and A.2

With the required containment sump monitor inoperable, no other form of sampling can provide the equivalent information; however, the containment ~~particulate~~ atmosphere radioactivity monitor will provide indications of changes in leakage. Together with the containment atmosphere radioactivity monitor, the periodic surveillance for RCS water inventory balance, SR 3.4.13.1, must be performed at an increased frequency of 24 hours to provide information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Restoration of the required sump monitor to OPERABLE status within a Completion Time of 30 days is required to regain the function after the monitor's failure. This time is acceptable, considering the Frequency and adequacy of the RCS water inventory balance required by Required Action A.1.

BASES

ACTIONS (continued)

B.1.1, B.1.2, and B.2

With ~~the~~ both gaseous and particulate containment atmosphere radioactivity monitoring instrumentation channels inoperable, alternative action is required. Either grab samples of the containment atmosphere must be taken and analyzed ~~for particulate radioactivity~~ or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information.

With a sample obtained and analyzed or water inventory balance performed every 24 hours, the reactor may be operated for up to 30 days to allow restoration of the required containment atmosphere radioactivity monitor~~s~~.

The 24 hour interval provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

C.1 and C.2

With the required containment sump monitor inoperable, the only means of detecting LEAKAGE is the required containment atmosphere radioactivity monitor. A Note clarifies that this Condition is applicable when the only OPERABLE monitor is the containment atmosphere gaseous radioactivity monitor. The containment atmosphere gaseous radioactivity monitor typically cannot detect a 1.0 gpm leak within one hour when RCS activity is low. In addition, this configuration does not provide the required diverse means of leakage detection. Indirect methods of monitoring RCS leakage must be implemented. Grab samples of the containment atmosphere must be taken to provide alternate periodic information. The 12 hour interval is sufficient to detect increasing RCS leakage. The Required Action provides 7 days to restore another RCS leakage monitor to OPERABLE status to regain the intended leakage detection diversity. The 7 day Completion Time ensures that the unit will not be operated in a degraded configuration for a lengthy time period.

BASES

ACTIONS (continued)

~~C~~D.1 and ~~C~~D.2

If a Required Action and associated Completion Time of Condition A, B or ~~B~~C is not met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to 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 plant systems.

~~D~~E.1

With all required monitors inoperable, no means of monitoring leakage are available, and immediate actions, in accordance with LCO 3.0.3, are required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere ~~particulate~~ radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere ~~particulate~~ radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test consists of exercising the digital computer hardware using data base manipulation and injecting simulated process data to verify OPERABILITY of alarm and trip functions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.
2. Regulatory Guide 1.45, Revision 0, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.
3. UFSAR, Section 5.2.5.
4. Safety Evaluation Regarding Leak-Before-Break Analysis - Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, dated October 25, 1996.

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ATTACHMENT 5

Proposed Technical Specifications Bases Changes for Byron Station, Units 1 and 2

Byron Station, Units 1 and 2

Facility Operating License Nos. NPF-37 and NPF-66

Mark-up of Technical Specifications Bases Pages*

B 3.4.15 – 1
B 3.4.15 – 2
B 3.4.15 – 3
B 3.4.15 – 4
B 3.4.15 – 5
B 3.4.15 – 6
B 3.4.15 – 7
B 3.4.15 – 8
B 3.4.15 – 9

* Note, the Byron Station TS Bases changes include an additional change for deletion of the language surrounding the humidity monitor on page B 3.4.15 – 2. This change is not related to TSTF-513 Revision 3, but is shown here as the TS Bases pages are in the process of being revised in accordance with 10 CFR 50.59.

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

GDC 30 of Appendix A to 10 CFR 50 (Ref. 1) requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide 1.45, Revision 0, (Ref. 2) describes acceptable methods for selecting leakage detection systems.

Leakage detection systems must have the capability to detect significant Reactor Coolant Pressure Boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE. In addition to meeting the OPERABILITY requirements, the monitors are typically set to provide the most sensitive response without causing an excessive number of spurious alarms.

~~Industry practice has shown that water flow changes of 0.5 to 1.0 gpm can be readily detected in contained volumes by monitoring changes in water level, in flow rate, or in the operating frequency of a pump.~~ The containment sump, used to collect unidentified LEAKAGE, is instrumented to identify leakages of 1.0 gpm within one hour. ~~This sensitivity is acceptable for detecting increases in unidentified LEAKAGE.~~

The reactor coolant contains radioactivity that, when released to the containment, ~~can~~ may be detected by radiation monitoring instrumentation. ~~An instrument sensitivity of 10^{-9} µCi/cc radioactivity for particulate monitoring is practical for leakage detection systems.~~ Radioactivity detection systems are~~is~~ included for monitoring both particulate and gaseous activit~~y~~ies because of ~~its~~ their ~~sensitivity~~ sensitivities and rapid responses to RCS LEAKAGE. ~~The detection of RCS leakage using radiation monitors depends on the concentration of radioactivity in the RCS.~~

Other indications may be used to detect an increase in unidentified LEAKAGE; however, they are not required to be OPERABLE by this LCO.

BASES

BACKGROUND (continued)

~~Since the humidity level is influenced by several factors, a quantitative evaluation of an indicated leakage rate by this means may be questionable and should be compared to observed increases in liquid flow into or from the containment sump. Humidity level monitoring is considered most useful as an indirect alarm or indication to alert the operator to a potential problem. Humidity monitors are not required by this LCO.~~

Air temperature and pressure monitoring methods may also be used to infer unidentified LEAKAGE to the containment. Containment temperature and pressure fluctuate slightly during unit operation, but a rise above the normally indicated range of values may indicate RCS leakage into the containment. The relevance of temperature and pressure measurements ~~are~~ is affected by containment free volume and, for temperature, detector location. Alarm signals from these instruments can be valuable in recognizing rapid and sizable leakage to the containment. Temperature and pressure monitors are not required by this LCO.

The above-mentioned LEAKAGE detection methods or systems differ in sensitivity and response time. Some of these systems could serve as early alarm systems signaling the operators that closer examination of other detection systems is necessary to determine the extent of any corrective action that may be required.

APPLICABLE SAFETY ANALYSES

The need to evaluate the severity of an alarm or an indication is important to the operators, and the ability to compare and verify with indications from other systems is necessary. ~~The system response times and sensitivities are described in the UFSAR (Ref. 3).~~

The safety significance of RCS LEAKAGE varies widely depending on its source, rate, and duration. Therefore, detecting and monitoring RCS LEAKAGE into the containment area is necessary. Quickly separating the identified LEAKAGE from the unidentified LEAKAGE provides quantitative information to the operators, allowing them to take corrective action should a leak occur detrimental to the safety of the plant and the public.

RCS leakage detection instrumentation satisfies Criterion 1 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

~~One method of protecting against large RCS leakage derives from the ability of instruments to rapidly detect extremely small leaks.~~ This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide ~~a high degree of~~ confidence that ~~extremely small leaks~~small amounts of unidentified LEAKAGE are detected in time to allow actions to place the unit in a safe condition, when RCS LEAKAGE indicates possible RCPB degradation. The RCS leak detection instrumentation required by this TS supports the Leak-Before-Break licensing basis (Ref. 4).

~~The LCO is satisfied when monitors of diverse measurement means are available. Thus, the containment sump monitor, in combination with a particulate radioactivity monitor, provides an acceptable minimum.~~

This LCO requires two instruments to be OPERABLE.

The containment sump is used to collect unidentified LEAKAGE. The LCO requirements apply to the total amount of unidentified LEAKAGE collected in the sump. The containment floor drain sump flow monitor (RF008) and the reactor cavity sump flow monitor (RF010) are normally utilized to fulfill the containment sump monitor requirement. Alarms are provided to alert the operator of leakages of 1.0 gpm. When the alarm function is not capable of detecting 1.0 gpm of unidentified LEAKAGE within one hour, the containment floor drain sump flow indication may be periodically monitored to ensure the capability of detecting 1.0 gpm of unidentified LEAKAGE within one hour.

In lieu of the containment floor drain sump flow monitor (RF008), either containment sump level monitor (PC002 or PC003) can be used by monitoring a change in sump level over a period of time in such a manner as to ensure the capability of detecting 1.0 gpm of unidentified LEAKAGE within one hour. For Byron Unit 2 only, the containment sump level monitors (PC002 and PC003) also have the ability to provide an alarm to alert the operator of leakages of 1.0 gpm.

The identification of unidentified LEAKAGE will be delayed by the time required for unidentified LEAKAGE to travel to the containment sump and it may take longer than one hour to detect unidentified LEAKAGE of 1.0 gpm, depending on the origin and magnitude of the LEAKAGE. This sensitivity is acceptable for containment sump monitor OPERABILITY.

~~For the containment atmosphere radioactivity monitor, the~~

~~PR011A (particulate) monitor satisfies the LCO requirement. The monitor is capable of detecting a 1.0 gpm leak within one hour at the sensitivity recommended in Regulatory Guide 1.45 and using the expected RCS activities of UFSAR Table 11.1-4. The actual setpoints are set as low as practicable, considering the actual concentration of radioactivity in the RCS and the containment background radiation concentration.~~

The reactor coolant contains radioactivity that, when released to the containment, can be detected by the gaseous or particulate containment atmosphere radioactivity monitor. Only one of the two detectors is required to be OPERABLE. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE, but have recognized limitations. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. If there are few fuel element cladding defects and low levels of activation products, it may not be possible for the gaseous or particulate containment atmosphere radioactivity monitor to detect 1.0 gpm increase within one hour during normal operation. However, the gaseous or particulate containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting 1.0 gpm increase in unidentified LEAKAGE within one hour given an RCS activity equivalent to that assumed in the design calculations for the monitors (UFSAR Table 11.1-4).

The LCO is satisfied when monitors of diverse measurement means are available. Thus, the containment sump monitor, in combination with a gaseous or particulate radioactivity monitor, provides an acceptable minimum.

BASES

APPLICABILITY

Because of elevated RCS temperature and pressure in MODES 1, 2, 3, and 4, RCS leakage detection instrumentation is required to be OPERABLE.

In MODE 5 or 6, the temperature is to be ≤ 200°F and pressure is maintained low or at atmospheric pressure. Since the temperatures and pressures are far lower than those for MODES 1, 2, 3, and 4, the likelihood of leakage and crack propagation are much smaller. Therefore, the requirements of this LCO are not applicable in MODES 5 and 6.

ACTIONS

A.1 and A.2

With the required containment sump monitor inoperable, no other form of sampling can provide the equivalent information; however, the containment ~~particulate~~ atmosphere radioactivity monitor will provide indications of changes in leakage. Together with the containment atmosphere radioactivity monitor, the periodic surveillance for RCS water inventory balance, SR 3.4.13.1, must be performed at an increased frequency of 24 hours to provide information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Restoration of the required sump monitor to OPERABLE status within a Completion Time of 30 days is required to regain the function after the monitor's failure. This time is acceptable, considering the Frequency and adequacy of the RCS water inventory balance required by Required Action A.1.

BASES

ACTIONS (continued)

B.1.1, B.1.2, and B.2

With ~~the~~ both gaseous and particulate containment atmosphere radioactivity monitoring instrumentation channels inoperable, alternative action is required. Either grab samples of the containment atmosphere must be taken and analyzed ~~for particulate radioactivity~~ or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information.

With a sample obtained and analyzed or water inventory balance performed every 24 hours, the reactor may be operated for up to 30 days to allow restoration of the required containment atmosphere radioactivity monitor.

The 24 hour interval provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

C.1 and C.2

With the required containment sump monitor inoperable, the only means of detecting LEAKAGE is the required containment atmosphere radioactivity monitor. A Note clarifies that this Condition is applicable when the only OPERABLE monitor is the containment atmosphere gaseous radioactivity monitor. The containment atmosphere gaseous radioactivity monitor typically cannot detect a 1.0 gpm leak within one hour when RCS activity is low. In addition, this configuration does not provide the required diverse means of leakage detection. Indirect methods of monitoring RCS leakage must be implemented. Grab samples of the containment atmosphere must be taken to provide alternate periodic information. The 12 hour interval is sufficient to detect increasing RCS leakage. The Required Action provides 7 days to restore another RCS leakage monitor to OPERABLE status to regain the intended leakage detection diversity. The 7 day Completion Time ensures that the unit will not be operated in a degraded configuration for a lengthy time period.

BASES

ACTIONS (continued)

~~C~~D.1 and D~~G~~.2

If a Required Action and associated Completion Time of Condition A, B or ~~B~~C is not met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to 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 plant systems.

~~D~~E.1

With all required monitors inoperable, no means of monitoring leakage are available, and immediate actions, in accordance with LCO 3.0.3, are required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere ~~particulate~~ radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere ~~particulate~~ radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test consists of exercising the digital computer hardware using data base manipulation and injecting simulated process data to verify OPERABILITY of alarm and trip functions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.
2. Regulatory Guide 1.45, Revision 0, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.
3. UFSAR, Section 5.2.5.
4. Safety Evaluation Regarding Leak-Before-Break Analysis - Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, dated October 25, 1996.

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