Exelon Nuclear
200 Exelon Way
Kennett Square, PA 19348

www.exeloncorp.com

Exelon. Nuclear

10CFR50.90

July 30, 2009

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
Docket Nos. 50-277 and 50-278

Subject: License Amendment Request for Adoption of TSTF-478-A, Revision 2, "BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control," Using the Consolidated Line Item Improvement Process

References:

1) TSTF-478-A, Revision 2, "BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control," dated November 21, 2007

2) Federal Register Notice 72FR65610 – Notice of Availability on Model Safety Evaluation; Model No Significant Hazards Determination, and Model Application for Licensees that Wish to Adopt TSTF-478, Revision 2, "BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control," dated November 21, 2007

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC, (Exelon) requests amendments to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

The proposed amendments would revise the TS for PBAPS, Units 2 and 3, consistent with NRC-approved Industry TS Task Force (TSTF) Change Traveler TSTF-478-A, Revision 2, *"BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control"* (Reference 1). The availability of this TS improvement was published in the Federal Register on November 21, 2007 (Reference 2) as part of the Consolidated Line Item Improvement Process (CLIIP). Exelon reviewed the proposed *No Significant Hazards Determination* published in Federal Register Notice 72FR65610, dated November 21, 2007 (Reference 2), as part of the CLIIP and determined that it is applicable to PBAPS, Units 2 and 3.

The proposed amendments would delete TS 3.6.3.1, "Containment Atmospheric Dilution (CAD) System," requirements and associated Bases from the PBAPS, Units 2 and 3, TS consistent with NRC-approved TSTF-478-A, Revision 2. This TSTF also discusses TS and associated Bases changes for the TS section concerning Drywell Cooling System Fans. The PBAPS, Units 2 and 3, TS do not contain this TS section, and therefore, these changes are not applicable. The NRC has previously approved a similar amendment request for Duane Arnold Energy

A001
NRR

Center dated June 28, 2007 (ML071420246). The Duane Arnold license amendment request was submitted by letter dated July 17, 2006 (ML062080521), and supplemented by letter dated March 20, 2007 (ML070890301).

Attachment 1 provides an evaluation and assessment of the proposed changes to remove TS requirements consistent with the applicable criteria specified in NRC-approved TSTF-478-A, Revision 2. These proposed changes will result in modifications to containment combustible gas control TS requirements as permitted by 10 CFR 50.44, *"Combustible gas control for nuclear power reactors."* Attachment 2 contains the TS page mark-ups for the proposed TS changes. Attachment 3 includes the re-typed TS pages. Attachment 4 contains the mark-ups for the associated TS Bases pages.

The proposed changes have been reviewed by the Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the Exelon Quality Assurance Program.

Exelon requests approval of the proposed amendments by July 30, 2010. Once approved, the amendments shall be implemented within 60 days.

There are no new commitments contained in this submittal.

Pursuant to 10 CFR 50.91(b)(1), a copy of this License Amendment Request is being provided to the designated official of the Commonwealth of Pennsylvania.

Should you have any questions concerning this letter, please contact Mr. Richard Gropp at (610) 765-5557.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of July 2009.

Respectfully,

Pamela B. Cowan
Director – Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1 – Evaluation of Proposed Changes for TSTF-478-A, Revision 2
2 – Mark-ups of Technical Specification Pages
3 – Re-typed Technical Specifications Pages
4 – Mark-ups of Technical Specification Bases Pages

cc: S. J. Collins, Administrator, Region I, USNRC
F. L. Bower, USNRC Senior Resident Inspector, PBAPS
J. Hughey, Project Manager, USNRC
R. R. Janati, Commonwealth of Pennsylvania
S. Gray, State of Maryland

ATTACHMENT 1

Evaluation of Proposed Changes

PBAPS, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56

"BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control Using the Consolidated Line Item Improvement Process"

1.0 SUMMARY DESCRIPTION

Exelon Generation Company, LLC, (Exelon) is requesting amendments to the Technical Specifications (TS), Appendix A, of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

The proposed amendments would delete TS 3.6.3.1, *"Containment Atmospheric Dilution (CAD) System,"* requirements and associated Bases to modify containment combustible gas control requirements as permitted by 10 CFR 50.44, *"Combustible gas control for nuclear power reactors."* The proposed changes are consistent with NRC-approved Revision 2 to Technical Specification Task Force (TSTF) Improved Standard Technical Specification Change Traveler, TSTF-478-A, Revision 2, *"BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control."* The availability of this TS improvement was published in the Federal Register on November 21, 2007 (Reference 2 - i.e., 72FR65610) as part of the Consolidated Line Item Improvement Process (CLIIP). Exelon reviewed the proposed *No Significant Hazards Determination* published in Federal Register Notice 72FR65610, dated November 21, 2007 (Reference 2), as part of the CLIIP and determined that it is applicable to PBAPS, Units 2 and 3.

Variations from the NRC-approved TSTF-478-A, Revision 2, and the proposed TS changes are delineated in Section 2.0 below.

2.0 DETAILED DESCRIPTION

Consistent with the NRC-approved Revision 2 of TSTF-478-A, the proposed TS changes delete TS 3.6.3.1, *"Containment Atmospheric Dilution (CAD) System,"* requirements. The proposed revisions to the TS Bases are also included in this submittal. Adoption of the TS Bases associated with TSTF-478-A, Revision 2, is an integral part of implementing the proposed TS amendments. The changes to the affected TS Bases pages will be incorporated in accordance with the TS Bases Control Program.

The proposed amendments are being made in accordance with the CLIIP. Exelon is proposing the following minor variations from the TS changes described in TSTF-478-A, Revision 2, and the U.S. Nuclear Regulatory Commission's (NRC's) model Safety Evaluation (SE) published in the Federal Register on November 21, 2007 (i.e., 72FR65610).

- The PBAPS, Unit 2 and 3, TS for the CAD System is TS 3.6.3.1 rather than TS 3.6.3.3 as provided in the TSTF mark-ups.
- TSTF-478-A, Revision 2, also makes TS and Bases changes for the TS section on Drywell Cooling System Fans. Since the PBAPS, Units 2 and 3, TS do not have this section these changes are not applicable.
- TS Section 3.8.7.b is being revised to delete the specific section reference for "LCO 3.6.3.1" pertaining to CAD.

3.0 BACKGROUND

The background for this application is stated in the model SE in the NRC's Notice of Availability published in the Federal Register on November 21, 2007 (i.e., 72 FR 65610) and TSTF-478-A, Revision 2. The proposed changes are consistent with the NRC-approved TSTF-478-A, Revision 2, intended to modify containment combustible gas control requirements as permitted by 10 CFR 50.44, *"Combustible gas control for nuclear power reactors."* The deviations from the approved TSTF-478-A, Revision 2, are discussed above in Section 2.0.

4.0 TECHNICAL EVALUATION

Exelon has reviewed the model SE published in the Federal Register dated November 21, 2007 (i.e., 72 FR 65610), as part of the CLIIP Notice of Availability. Exelon has concluded that the changes presented in the model SE prepared by the NRC are applicable to PBAPS, Units 2 and 3, and therefore, justify the proposed TS amendments.

Section 5.2.3.9 of the PBAPS, Units 2 and 3, Updated Final Safety Analysis Report (UFSAR) describes the CAD System and discusses the system conformance with the requirements of 10 CFR 50.44, and General Design Criteria (GDC) 41, 42, and 43 of Appendix A to 10 CFR 50.

GDC 41, *"Containment atmosphere cleanup,"* of Appendix A to 10 CFR 50 requires in part, that systems shall be provided as necessary to reduce the concentration and quality of fission products and control the concentration of hydrogen, oxygen, and other substances in the containment atmosphere following postulated accidents to assure that containment integrity is maintained. The requirements of 10 CFR 50.44 provide the standards for controlling combustible gas that may accumulate in the containment atmosphere during accidents.

10 CFR 50.44 was revised on September 16, 2003 (i.e., 68FR54123), based on studies that led to an improved understanding of combustible gas behavior during severe accidents. The studies confirmed that the hydrogen release postulated from a design-basis Loss of Coolant Accident (LOCA) was not risk significant because it was not large enough to lead to early containment failure, and that the risk associated with hydrogen combustion was from beyond design-basis (i.e., severe) accidents. As a result, requirements for maintaining hydrogen control equipment associated with a design-basis LOCA were eliminated from 10 CFR 50.44. Regulatory Guide (RG) 1.7, *"Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident,"* Revision 3, dated March 2007, provides detailed guidance that would be acceptable for implementing 10 CFR 50.44.

The CAD system will be maintained functional to support the operation of the Safety Grade Instrument Gas (SGIG) system. This ensures that a back-up pneumatic source is available for the operation of the Primary Containment Isolation Valves and Reactor Building-to-Suppression Chamber Vacuum Breakers. Maintaining the CAD system functional will also allow the system to be potentially used in conjunction with the station emergency operating procedures.

5.0 REGULATORY EVALUATION

5.1 Applicable Regulatory Requirements

A description of these proposed changes and their relationship to applicable regulatory requirements and guidance was provided in the NRC's Notice of Availability published in the Federal Register dated November 21, 2007 (i.e., 72FR65610).

5.2 Precedent

This application is being made in accordance with the CLIIP. Exelon is not proposing significant variations or deviations from the TS changes described in TSTF-478-A, Revision 2 or in the content of the NRC's model SE published in the Federal Register on November 21, 2007 (i.e., 72FR65610). A similar amendment request was submitted for Duane Arnold Energy Center on July 17, 2006 (ML062080521). The NRC approved the license amendment request for Duane Arnold on June 28, 2007 (ML071790186).

5.3 No Significant Hazards Consideration (NSHC)

Exelon has reviewed the proposed no significant hazards consideration determination published in the *Federal Register* on November 21, 2007 (i.e., 72FR65610), as part of the CLIIP Notice of Availability. Exelon has concluded that the determination presented in the notice is applicable to PBAPS, Units 2 and 3, and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

Based on the above, Exelon concludes that the proposed changes do not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of no significant hazards consideration is justified.

5.4 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

Exelon has reviewed the environmental evaluation included in the model SE published on November 21, 2007 (i.e., 72 FR 65610), as part of the CLIIP Notice of Availability. Exelon has concluded that the NRC's findings presented in that evaluation are applicable to PBAPS, Units 2 and 3, and the evaluation is hereby incorporated by reference for this application.

7.0 REFERENCES

1. Federal Register Notice, Notice of Availability published on November 21, 2007 (72FR65610).

2. TSTF-478-A Revision 2, *"BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control."*

3. NRC letter dated June 28, 2007 to Duane Arnold Energy Center – Issuance of Amendment Regarding Technical Specification Change Related to the Revised Rule for Combustible Gas Control (TAC No. MD2619) (ML071420246)

4. Duane Arnold Energy Center letter dated July 17, 2006 to U.S. Nuclear Regulatory Commission – Technical Specification Change Request (TSCR-083): Adoption of TSTF-478, Rev. 0, "BWR technical Specification Changes that Implement the Revised Rule for Combustible Gas Control" (ML062080521)

5. Duane Arnold Energy Center letter dated March 20, 2007 to U.S. Nuclear Regulatory Commission – Response to Request for Additional Information Regarding Proposed Technical Specification Changes at Duane Arnold Energy Center to Implement the Revised Rule for Combustible Gas Control (TAC No. MD2619) (ML070890301)

ATTACHMENT 2

Mark-ups of Technical Specifications Pages

PBAPS, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56

REVISED TECHNICAL SPECIFICATIONS PAGES

Unit 2	Unit 3
ii	ii
3.6-31	3.6-31
3.6-32	3.6-32
3.8-41	3.8-41

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.3.1 ~~Containment Atmospheric Dilution (CAD) System~~Deleted

LCO 3.6.3.1 Two CAD subsystems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both CAD subsystems inoperable.	A.1 Restore CAD subsystem(s) to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify Safety Grade Instrument Gas (SGIG) System header pressure is ≥ 80 psig.	24 hours
SR 3.6.3.1.2	Verify CAD System liquid nitrogen storage tank level is ≥ 33 inches water column.	24 hours
SR 3.6.3.1.3	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.3.1.4	Verify each SGIG System manual valve in the flow paths servicing CAD System valves, that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.3.1.5	Verify the CAD System supplies nitrogen to the SGIG System upon loss of the normal air supply.	24 months

The information on this page has been deleted.
Intentionally left blank.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems—Operating

LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE:

a. Unit 2 Division I and Division II AC and DC electrical power distribution subsystems; and

b. Unit 3 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE by LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," LCO 3.5.1, "ECCS —Operating," LCO 3.6.2.3, "RHR Suppression Pool Cooling," LCO 3.6.2.4, "RHR Suppression Pool Spray," ~~LCO 3.6.3.1,~~ "Containment Atmospheric Dilution (CAD) System," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.7.1, "High Pressure Service Water (HPSW) System," LCO 3.7.2, "Emergency Service Water (ESW) System and Normal Heat Sink," LCO 3.7.3, "Emergency Heat Sink," and LCO 3.8.1, "AC Sources—Operating."

APPLICABILITY: MODES 1, 2, and 3.

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.3.1 ~~Containment Atmospheric Dilution (CAD) System~~Deleted

LCO 3.6.3.1 Two CAD subsystems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or both CAD subsystems inoperable.	A.1	Restore CAD subsystem(s) to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify Safety Grade Instrument Gas (SGIG) System header pressure is ≥ 80 psig.	24 hours
SR 3.6.3.1.2	Verify CAD System liquid nitrogen storage tank level is ≥ 33 inches water column.	24 hours
SR 3.6.3.1.3	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.3.1.4	Verify each SGIG System manual valve in the flow paths servicing CAD System valves, that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.3.1.5	Verify the CAD System supplies nitrogen to the SGIG System upon loss of the normal air supply.	24 months

The information on this page has been deleted.
Intentionally left blank.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems—Operating

LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE:

a. Unit 2 Division I and Division II AC and DC electrical power distribution subsystems; and

b. Unit 3 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE by LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," LCO 3.5.1, "ECCS—Operating," LCO 3.6.2.3, "RHR Suppression Pool Cooling," LCO 3.6.2.4, "RHR Suppression Pool Spray," ~~LCO 3.6.3.1,~~ "Containment Atmospheric Dilution (CAD) System," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.7.1, "High Pressure Service Water (HPSW) System," LCO 3.7.2, "Emergency Service Water (ESW) System and Normal Heat Sink," LCO 3.7.3, "Emergency Heat Sink," LCO 3.7.4, "Main Control Room Emergency Ventilation (MCREV) System," and LCO 3.8.1, "AC Sources—Operating."

APPLICABILITY: MODES 1, 2, and 3.

ATTACHMENT 3

Re-typed Technical Specifications Pages

PBAPS, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56

REVISED TECHNICAL SPECIFICATIONS PAGES

Unit 2	Unit 3
ii	ii
3.6-31	3.6-31
3.6-32	3.6-32
3.8-41	3.8-41

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.3.1 Deleted

The information on this page has been deleted.
Intentionally left blank.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems—Operating

LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE:

a. Unit 2 Division I and Division II AC and DC electrical power distribution subsystems; and

b. Unit 3 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE by LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," LCO 3.5.1, "ECCS —Operating," LCO 3.6.2.3, "RHR Suppression Pool Cooling," LCO 3.6.2.4, "RHR Suppression Pool Spray," "Containment Atmospheric Dilution (CAD) System," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.7.1, "High Pressure Service Water (HPSW) System," LCO 3.7.2, "Emergency Service Water (ESW) System and Normal Heat Sink," LCO 3.7.3, "Emergency Heat Sink," and LCO 3.8.1, "AC Sources—Operating."

APPLICABILITY: MODES 1, 2, and 3.

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.3.1 Deleted

The information on this page has been deleted.
Intentionally left blank.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems—Operating

LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE:

a. Unit 2 Division I and Division II AC and DC electrical power distribution subsystems; and

b. Unit 3 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE by LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," LCO 3.5.1, "ECCS—Operating," LCO 3.6.2.3, "RHR Suppression Pool Cooling," LCO 3.6.2.4, "RHR Suppression Pool Spray," "Containment Atmospheric Dilution (CAD) System," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.7.1, "High Pressure Service Water (HPSW) System," LCO 3.7.2, "Emergency Service Water (ESW) System and Normal Heat Sink," LCO 3.7.3, "Emergency Heat Sink," LCO 3.7.4, "Main Control Room Emergency Ventilation (MCREV) System," and LCO 3.8.1, "AC Sources—Operating."

APPLICABILITY: MODES 1, 2, and 3.

ATTACHMENT 4

Mark-ups of Technical Specifications Bases Pages

PBAPS, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56

REVISED TECHNICAL SPECIFICATIONS BASES PAGES

Unit 2	Unit 3
ii	ii
B 3.6-16	B 3.6-16
B 3.6-35	B 3.6-35
B 3.6-64	B 3.6-64
B 3.6-65	B 3.6-65
B 3.6-66	B 3.6-66
B 3.6-67	B 3.6-67
B 3.6-68	B 3.6-68
B 3.6-69	B 3.6-69
B 3.6-70	B 3.6-70

TABLE OF CONTENTS (continued)

(continued)

BACKGROUND (continued)

each of the supported system and components in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," and LCO 3.6.1.5, "Reactor Building-to-Suppression Chamber Vacuum Breakers~~,~~." ~~and LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~ For the SGIG System, liquid nitrogen from the CAD System liquid nitrogen storage tank passes through the CAD System liquid nitrogen vaporizer where it is converted to a gas. The gas then flows into a Unit 2 header and a Unit 3 header separated by two manual globe valves. From each header, the gas then branches to each valve operator or valve seal supplied by the SGIG System. Each branch is separated from the header by a manual globe valve and a check valve.

To support SGIG System functions, the CAD System liquid nitrogen storage tank minimum required level is a 16 inches water column and a minimum required SGIG System header pressure of 80 psig. ~~Minimum requirements for the CAD System liquid nitrogen storage tank to support CAD System OPERABILITY are specified in LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~

APPLICABLE SAFETY ANALYSES

The PCIVs LCO was derived from the assumptions related to minimizing the loss of reactor coolant inventory, and establishing the primary containment boundary during major accidents. As part of the primary containment boundary, PCIV OPERABILITY supports leak tightness of primary containment. Therefore, the safety analysis of any event requiring isolation of primary containment is applicable to this LCO.

The DBAs that result in a release of radioactive material and are mitigated by PCIVs are a LOCA and a main steam line break (MSLB). In the analysis for each of these accidents, it is assumed that PCIVs are either closed or close within the required isolation times following event initiation. This ensures that potential paths to the environment through PCIVs (including primary containment purge valves) are minimized. Of the events analyzed in Reference 1, the LOCA is a limiting event due to radiological consequences. The closure time of the main steam isolation valves (MSIVs) is the most significant variable from a radiological standpoint. The MSIVs are required to close within 3 to 5 seconds after signal generation. Likewise, it is assumed that the primary containment is isolated such that release of fission products to the environment is controlled.

(continued)

BASES

BACKGROUND (continued)

suppression chamber atmosphere. Low spray temperatures and atmospheric conditions that yield the minimum amount of contained noncondensible gases are assumed for conservatism.

The Safety Grade Instrument Gas (SGIG) System supplies pressurized nitrogen gas (from the Containment Atmospheric Dilution (CAD) System liquid nitrogen storage tank) as a safety grade pneumatic source to the CAC System purge and exhaust isolation valve inflatable seals, the reactor building-to-suppression chamber vacuum breaker air operated isolation butterfly valves and inflatable seal, and the CAC and CAD Systems vent control air operated valves. The SGIG System thus performs two distinct post-LOCA functions: (1) supports containment isolation and (2) supports CAD System vent operation. SGIG System requirements are addressed for each of the supported system and components in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," LCO 3.6.1.5, and "Reactor Building-to-Suppression Chamber Vacuum Breakers~~,"~~." ~~and LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~ For the SGIG System, liquid nitrogen from the CAD System liquid nitrogen storage tank passes through the CAD System liquid nitrogen vaporizer where it is converted to a gas. The gas then flows into a Unit 2 header and a Unit 3 header separated by two manual globe valves. From each header, the gas then branches to each valve operator or valve seal supplied by the SGIG System. Each branch is separated from the header by a manual globe valve and a check valve.

To support SGIG System functions, the CAD System liquid nitrogen storage tank minimum required level is a 16 inches water column and a minimum required SGIG System header pressure of 80 psig. ~~Minimum requirements for the CAD System liquid nitrogen storage tank to support CAD System OPERABILITY are specified in LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~

APPLICABLE SAFETY ANALYSES

Analytical methods and assumptions involving the reactor building-to-suppression chamber vacuum breakers are used as part of the accident response of the containment systems. Internal (suppression-chamber-to-drywell) and external (reactor building-to-suppression chamber) vacuum breakers

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3.1 ~~Containment Atmospheric Dilution (CAD) System~~Deleted

BASES

BACKGROUND

The CAD System functions to maintain combustible gas concentrations within the primary containment at or below the flammability limits following a postulated loss of coolant accident (LOCA) by purging hydrogen and oxygen with nitrogen. To ensure that a combustible gas mixture does not occur, oxygen concentration is kept < 5.0 volume percent (v/o).

The CAD System is manually initiated and consists of two 100% capacity subsystems. Each subsystem consists of the liquid nitrogen supply tank, the atmospheric vaporizer, an electric vaporizer, and connected piping to supply the drywell and suppression chamber volumes. The liquid nitrogen tank, the atmospheric vaporizer and electric vaporizer are common components which are shared between the CAD subsystems of the two units. Piping from the liquid nitrogen tank downstream of the vaporizers is routed into a common header where it is split and routed to each unit. *Two pipes are routed to each unit.* Each of the two pipes to a particular unit divides to supply nitrogen to both the drywell and suppression chamber. The intent of this arrangement is to provide redundant nitrogen supplies to both the drywell and suppression chamber to satisfy single failure criteria. In order to purge primary containment of combustible gases, the original CAD System design provided two vents for each unit. One is to allow venting from the drywell and the other is to allow venting from the suppression chamber. The nitrogen storage tank contains ≥ 3841 gallons (which corresponds to a level of 33 inches water column), which is adequate for 7 days of CAD System and Safety Grade Instrument Gas (SGIG) System operation for both units.

The SGIG System supplies pressurized nitrogen gas (from the CAD System liquid nitrogen storage tank) as a safety grade pneumatic source to the Containment Atmospheric Control (CAC) System purge and exhaust isolation valve inflatable seals, the reactor building-to-suppression chamber vacuum breaker air operated isolation valves and inflatable seal, *and the CAC and CAD Systems vent control air operated* valves. The SGIG System thus performs two distinct post-

(continued)

BASES

BACKGROUND (continued)

LOCA functions: (1) supports containment isolation and (2) supports CAD System vent operation. SGIG System requirements are addressed for each of the supported system and components in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," LCO 3.6.1.5, "Reactor Building-to-Suppression Chamber Vacuum Breakers," and LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System." For the SGIG System, liquid nitrogen from the CAD System liquid nitrogen storage tank passes through the CAD System liquid nitrogen vaporizer where it is converted to a gas. The gas then flows into a Unit 2 header and a Unit 3 header separated by two manual globe valves. From each header, the gas then branches to each valve operator or valve seal supplied by the SGIG System. Each branch is separated from the header by a manual globe valve and a check valve.

The CAD System operates as directed in the emergency operating procedures to remove combustible gases from primary containment.

APPLICABLE SAFETY ANALYSES

The CAD System is manually initiated from the main control room in the purge mode as directed by the emergency operating procedures (EOPs), if it is determined that the concentration of combustible gases in primary containment exceeds the action levels specified in the EOPs. The CAD System is used ... tion rates

The information on this page has been deleted.
Intentionally left blank.

The CAD System was originally designed to dilute containment oxygen by repressurizing primary containment with nitrogen to approximately 50% of the containment design pressure. Above this pressure, containment would be vented to maintain this pressure while CAD continued to supply diluting nitrogen. The original design calculations demonstrated that, with oxygen generation rates specified in Regulatory Guide 1.7, Table 1 (Reference 3), and the CAD system operated per its original design mode (i.e., repressurization), oxygen concentrations would be maintained < 5 v/o and offsite doses would be maintained less than the requirements of 10 CFR50.44.

The PBAPS combustible gas control system has since been reevaluated with oxygen generation rates based on experimentally and analytically determined parameters as permitted in Regulatory Guide 1.7, and documented in NEDO-22155 and Reference 1. As a result it was found that the primary containment inerting alone is sufficient to maintain oxygen concentrations < 5 v/o and that CAD system operation would not be required to control combustible gases. Therefore, the CAD system, and in particular containment venting, is *no longer considered the primary means of* combustible gas control. As a result, no releases or offsite doses are anticipated to result from design basis combustible gas control.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Nevertheless, Reference 1 did direct that the CAD System be maintained as it was originally designed to comply with the requirements of criteria 41, 42, and 43 of Appendix A of 10 CFR Part 50 and installed in accordance with 10CFR50.44 (Reference 2).

The CAD System satisfies the requirements of NRC Policy Statement (Reference 5) because through Reference 1 review, the CAD System has been determined to be important to public health and safety. Thus, it is retained in the Technical Specifications.

LCO

Two CAD subsystems must be OPERABLE. This ensures operation of at least one CAD subsystem in the event of a worst case single active failure. Operation of at least one CAD subsystem is designed to maintain primary containment post-LOCA oxygen concentration < 5.0 v/o for 7 days.

For the CAD System vent control air operated valves and the CAC System vent control air operated valves which support CAD System operation to be considered OPERABLE, the SGIG System supplying nitrogen gas to the air operators of these valves must be OPERABLE.

The information on this page has been deleted.
Intentionally left blank.

APPLICABILITY

... maintain the ... below the flammability limit of 5.0 v/o following a LOCA. This ensures that the relative leak tightness of primary containment is adequate and prevents damage to safety related equipment and instruments located within primary containment.

In MODE 3, both the hydrogen and oxygen production rates and the total amounts produced after a LOCA would be less than those calculated for the Design Basis Accident LOCA. Thus, if the analysis were to be performed starting with a LOCA in MODE 3, the time to reach a flammable concentration would be extended beyond the time conservatively calculated for MODES 1 and 2. The extended time would allow hydrogen removal from the primary containment atmosphere by other means and also allow repair of an inoperable CAD subsystem, if CAD were not available. Therefore, the CAD System is not required to be OPERABLE in MODE 3.

In MODES 4 and 5, the probability and consequences of a LOCA are reduced due to the pressure and temperature limitations of these MODES. Therefore, the CAD System is not required to be OPERABLE in MODES 4 and 5.

ACTIONS

A.1

If one or both CAD subsystems (or one or more supply and vent paths) are inoperable, both subsystems must be restored to OPERABLE status within 30 days. In this Condition, the oxygen control function of the CAD System may be lost. However, alternate oxygen control capabilities may be provided by the Primary Containment Inerting System. The

(continued)

BASES

ACTIONS

A.1 *(continued)*

30 day Completion Time is based on the low probability of the occurrence of a LOCA that would generate hydrogen and oxygen in amounts capable of exceeding the flammability limit, the amount of time available after the event for operator action to prevent exceeding this limit, and the availability of other hydrogen mitigating systems.

B.1

If any Required Action cannot be met within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the
12 hours.
The information on this page has been deleted.
Intentionally left blank.
onable, based
ll power
conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1.1

This SR ensures that the pressure in the SGIG System header is ≥ 80 psig. This ensures that the post-LOCA nitrogen pressure provided to the valve operators and valve seals is adequate for the SGIG System to perform its design function. The 24 hour Frequency was developed considering the importance of the SGIG System for maintaining the containment isolation function and combustible gas control function of valves supplied by the SGIG System. The 24 hour Frequency is also considered to be adequate to ensure timely detection of any breach in the SGIG System which would render the system incapable of performing its function.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.1.2

Verifying that the level in the CAD liquid nitrogen tank is ≥ 33 inches water column will ensure at least 7 days of post-LOCA CAD System and SGIG System operation for both units. This minimum volume of liquid nitrogen allows sufficient time after an accident to replenish the nitrogen supply for long term inerting. This is verified every 24 hours to ensure that the system is capable of performing its intended function when required. The 24 hour Frequency is based on operating experience, which has shown 24 hours to be an acceptable period to verify the liquid nitrogen supply and on the availability of other hydrogen mitigating systems.

SR 3.6.3.1.3

The information on this page has been deleted.
Intentionally left blank.

operated, ... flow paths ... st for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing.

A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable because the CAD System is manually initiated. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day Frequency is appropriate because the valves are operated under procedural control, improper valve position would only affect a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.1.4

Verifying the correct alignment for each manual valve in the SGIG System required flow paths provides assurance that the proper flow paths exist for system operation. This SR does not apply to valves that are locked or otherwise secured in position, since these valves were verified to be in the correct position prior to locking or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable because the CAD System is manually initiated. This SR does not apply to valves that cannot be inadvertently misaligned such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.6.3.1.5

The information on this page has been deleted.
Intentionally left blank.

instrument
rform its
ired
pressure for valve operators and valve seals supported by the SGIG System. The 24 month Frequency was developed considering it is prudent that this Surveillance be performed only during a plant outage. Operating experience has shown that these components will usually pass this Surveillance when performed at the 24 month Frequency. Thus, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. Nuclear Regulatory Commission (NRC) Letter (SER) from John E. Stolz (Chief, Operating Reactors Branch (Division of Licensing)) to Edward G. Bauer, Jr., Vice President and General Counsel, Philadelphia Electric Company "Recombiner Capability Requirements of 10CFR50.44(c)(3)(ii) Generic Letter 84-09" dated 6/26/85.
2. 10 CFR Part 50.
3. Regulatory Guide 1.7, Revision 0.
4. UFSAR, Section 5.2.3.9.5.
5. Final Policy statement on Technical Specification Improvements July 22, 1993 (58 FR3913)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3.2 Primary Containment Oxygen Concentration

BASES

BACKGROUND

All nuclear reactors must be designed to withstand events that generate hydrogen either due to the zirconium metal water reaction in the core or due to radiolysis. The primary method to control hydrogen is to inert the primary containment. With the primary containment inert, that is, oxygen concentration < 4.0 volume percent (v/o), a combustible mixture cannot be present in the primary containment for any hydrogen concentration. The capability to inert the primary containment and maintain oxygen < 4.0 v/o works together with the Containment Atmospheric Dilution (CAD) System ~~(LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System)~~ to provide redundant and diverse methods to mitigate events that produce hydrogen. For example, an event that rapidly generates hydrogen from zirconium metal water reaction will result in excessive hydrogen in primary containment, but oxygen concentration will remain < 4.0 v/o and no combustion can occur. Long term generation of both hydrogen and oxygen from radiolytic decomposition of water may eventually result in a combustible mixture in primary containment, except that the CAD System dilutes and removes hydrogen and oxygen gases faster than they can be produced from radiolysis and again no combustion can occur. This LCO ensures that oxygen concentration does not exceed 4.0 v/o during operation in the applicable conditions.

APPLICABLE SAFETY ANALYSES

The Reference 1 calculations assume that the primary containment is inerted when a Design Basis Accident loss of coolant accident occurs. Thus, the hydrogen assumed to be released to the primary containment as a result of metal water reaction in the reactor core will not produce combustible gas mixtures in the primary containment. Oxygen, which is subsequently generated by radiolytic decomposition of water, is diluted and removed by the CAD System more rapidly than it is produced.

Primary containment oxygen concentration satisfies Criterion 2 of the NRC Policy Statement.

(continued)

TABLE OF CONTENTS (continued)

(continued)

BACKGROUND (continued)

each of the supported system and components in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," and LCO 3.6.1.5, "Reactor Building-to-Suppression Chamber Vacuum Breakers~~,~~." ~~and LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~ For the SGIG System, liquid nitrogen from the CAD System liquid nitrogen storage tank passes through the CAD System liquid nitrogen vaporizer where it is converted to a gas. The gas then flows into a Unit 2 header and a Unit 3 header separated by two manual globe valves. From each header, the gas then branches to each valve operator or valve seal supplied by the SGIG System. Each branch is separated from the header by a manual globe valve and a check valve.

To support SGIG System functions, the CAD System liquid nitrogen storage tank minimum required level is a 16 inches water column and a minimum required SGIG System header pressure of 80 psig. ~~Minimum requirements for the CAD System liquid nitrogen storage tank to support CAD System OPERABILITY are specified in LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~

APPLICABLE SAFETY ANALYSES

The PCIVs LCO was derived from the assumptions related to minimizing the loss of reactor coolant inventory, and establishing the primary containment boundary during major accidents. As part of the primary containment boundary, PCIV OPERABILITY supports leak tightness of primary containment. Therefore, the safety analysis of any event requiring isolation of primary containment is applicable to this LCO.

The DBAs that result in a release of radioactive material and are mitigated by PCIVs are a LOCA and a main steam line break (MSLB). In the analysis for each of these accidents, it is assumed that PCIVs are either closed or close within the required isolation times following event initiation. This ensures that potential paths to the environment through PCIVs (including primary containment purge valves) are minimized. Of the events analyzed in Reference 1, the LOCA is a limiting event due to radiological consequences. The closure time of the main steam isolation valves (MSIVs) is the most significant variable from a radiological standpoint. The MSIVs are required to close within 3 to 5 seconds after signal generation. Likewise, it is assumed that the primary containment is isolated such that release of fission products to the environment is controlled.

(continued)

BACKGROUND (continued)

suppression chamber atmosphere. Low spray temperatures and atmospheric conditions that yield the minimum amount of contained noncondensible gases are assumed for conservatism.

The Safety Grade Instrument Gas (SGIG) System supplies pressurized nitrogen gas (from the Containment Atmospheric Dilution (CAD) System liquid nitrogen storage tank) as a safety grade pneumatic source to the CAC System purge and exhaust isolation valve inflatable seals, the reactor building-to-suppression chamber vacuum breaker air operated isolation butterfly valves and inflatable seal, and the CAC and CAD Systems vent control air operated valves. The SGIG System thus performs two distinct post-LOCA functions: (1) supports containment isolation and (2) supports CAD System vent operation. SGIG System requirements are addressed for each of the supported system and components in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," and LCO 3.6.1.5, "Reactor Building-to-Suppression Chamber Vacuum Breakers~~,~~." ~~and LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~ For the SGIG System, liquid nitrogen from the CAD System liquid nitrogen storage tank passes through the CAD System liquid nitrogen vaporizer where it is converted to a gas. The gas then flows into a Unit 2 header and a Unit 3 header separated by two manual globe valves. From each header, the gas then branches to each valve operator or valve seal supplied by the SGIG System. Each branch is separated from the header by a manual globe valve and a check valve.

To support SGIG System functions, the CAD System liquid nitrogen storage tank minimum required level is a 16 inches water column and a minimum required SGIG System header pressure of 80 psig. ~~Minimum requirements for the CAD System liquid nitrogen storage tank to support CAD System OPERABILITY are specified in LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System."~~

APPLICABLE SAFETY ANALYSES

Analytical methods and assumptions involving the reactor building-to-suppression chamber vacuum breakers are used as part of the accident response of the containment systems. Internal (suppression-chamber-to-drywell) and external (reactor building-to-suppression chamber) vacuum breakers

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3.1 ~~Containment Atmospheric Dilution (CAD) System~~Deleted

BASES

BACKGROUND

The CAD System functions to maintain combustible gas concentrations within the primary containment at or below the flammability limits following a postulated loss of coolant accident (LOCA) by purging hydrogen and oxygen with nitrogen. To ensure that a combustible gas mixture does not occur, oxygen concentration is kept < 5.0 volume percent (v/o).

The CAD System is manually initiated and consists of two 100% capacity subsystems. Each subsystem consists of the liquid nitrogen supply tank, the atmospheric vaporizer, an electric vaporizer, and connected piping to supply the drywell and suppression chamber volumes. The liquid nitrogen tank, the atmospheric vaporizer and electric vaporizer are common components which are shared between the CAD subsystems of the two units. Piping from the liquid nitrogen tank downstream of the vaporizers is routed into a common header where it is split and routed to each unit. Two pipes are routed to each unit. Each of the two pipes to a particular unit divides to supply nitrogen to both the drywell and suppression chamber. The intent of this arrangement is to provide redundant nitrogen supplies to both the drywell and suppression chamber to satisfy single failure criteria. In order to purge primary containment of combustible gases, the original CAD System design provided two vents for each unit. One is to allow venting from the drywell and the other is to allow venting from the suppression chamber. *The nitrogen storage tank contains* ≥ 3841 gallons (which corresponds to a level of 33 inches water column), which is adequate for 7 days of CAD System and Safety Grade Instrument Gas (SGIG) System operation for both units.

The SGIG System supplies pressurized nitrogen gas (from the CAD System liquid nitrogen storage tank) as a safety grade pneumatic source to the Containment Atmospheric Control (CAC) System purge and exhaust isolation valve inflatable seals, the reactor building-to-suppression chamber vacuum breaker air operated isolation valves and inflatable seal, and the CAC and CAD Systems vent control air operated valves. The SGIG System thus performs two distinct post-

(continued)

BASES

BACKGROUND (continued)

LOCA functions: (1) supports containment isolation and (2) supports CAD System vent operation. SGIG System requirements are addressed for each of the supported system and components in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," LCO 3.6.1.5, "Reactor Building-to-Suppression Chamber Vacuum Breakers," and LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System." For the SGIG System, liquid nitrogen from the CAD System liquid nitrogen storage tank passes through the CAD System liquid nitrogen vaporizer where it is converted to a gas. The gas then flows into a Unit 2 header and a Unit 3 header separated by two manual globe valves. From each header, the gas then branches to each valve operator or valve seal supplied by the SGIG System. Each branch is separated from the header by a manual globe valve and a check valve.

The CAD System operates as directed in the emergency operating procedures to remove combustible gases from primary containment.

APPLICABLE SAFETY ANALYSES

The CAD System is manually initiated from the main control room in the purge mode as directed by the emergency operating

The information on this page has been deleted.
Intentionally left blank.

...he concentration ...xceeds the ...ystem is used ...ation rates exceed the design basis assumptions.

The CAD System was originally designed to dilute containment oxygen by repressurizing primary containment with nitrogen to approximately 50% of the containment design pressure. Above this pressure, containment would be vented to maintain this pressure while CAD continued to supply diluting nitrogen. The original design calculations demonstrated that, with oxygen generation rates specified in Regulatory Guide 1.7, Table 1 (Reference 3), and the CAD system operated per its original design mode (i.e., repressurization), oxygen concentrations would be maintained < 5 v/o and offsite doses would be maintained less than the requirements of 10 CFR50.44.

The PBAPS combustible gas control system has since been reevaluated with oxygen generation rates based on experimentally and analytically determined parameters as permitted in Regulatory Guide 1.7, and documented in NEDO-22155 and Reference 1. As a result it was found that the primary containment inerting alone is sufficient to maintain oxygen concentrations < 5 v/o and that CAD system operation would *not* be required to control combustible gases. Therefore, the CAD system, and in particular containment venting, is no longer considered the primary means of combustible gas control. As a result, no releases or offsite doses are anticipated to result from design basis combustible gas control.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

Nevertheless, Reference 1 did direct that the CAD System be maintained as it was originally designed to comply with the requirements of criteria 41, 42, and 43 of Appendix A of 10 CFR Part 50 and installed in accordance with 10CFR50.44 (Reference 2).

The CAD System satisfies the requirements of NRC Policy Statement (Reference 5) because through Reference 1 review, the CAD System has been determined to be important to public health and safety. Thus, it is retained in the Technical Specifications.

LCO

Two CAD subsystems must be OPERABLE. This ensures operation of at least one CAD subsystem in the event of a worst case single active failure. Operation of at least one CAD subsystem is designed to maintain primary containment post-LOCA oxygen concentration < 5.0 v/o for 7 days.

For the CAD System vent control air operated valves and the CAC System vent control air operated valves which support CAD System operation to be considered OPERABLE, the SGIG System supplying nitrogen gas to the air operators of these valves must be OPERABLE.

APPLICABILITY

In MODES 1 and 2, the CAD System is required to maintain the ... ent below the ... CA. This ... primary containment is adequate and prevents damage to safety related equipment and instruments located within primary containment.

The information on this page has been deleted.
Intentionally left blank.

In MODE 3, both the hydrogen and oxygen production rates and the total amounts produced after a LOCA would be less than those calculated for the Design Basis Accident LOCA. Thus, if the analysis were to be performed starting with a LOCA in MODE 3, the time to reach a flammable concentration would be extended beyond the time conservatively calculated for MODES 1 and 2. The extended time would allow hydrogen removal from the primary containment atmosphere by other means and also allow repair of an inoperable CAD subsystem, if CAD were not available. Therefore, the CAD System is not required to be OPERABLE in MODE 3.

In MODES 4 and 5, the probability and consequences of a LOCA are reduced due to the pressure and temperature limitations of these MODES. Therefore, the CAD System is not required to be OPERABLE in MODES 4 and 5.

ACTIONS

A.1

If one or both CAD subsystems (or one or more supply and vent paths) are inoperable, both subsystems must be restored to OPERABLE status within 30 days. In this Condition, the oxygen control function of the CAD System may be lost. However, alternate oxygen control capabilities may be provided by the Primary Containment Inerting System. The

(continued)

ACTIONS

A.1 (continued)

30 day Completion Time is based on the low probability of the occurrence of a LOCA that would generate hydrogen and oxygen in amounts capable of exceeding the flammability limit, the amount of time available after the event for operator action to prevent exceeding this limit, and the availability of other hydrogen mitigating systems.

B.1

If any Required Action cannot be met within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

The information on this page has been deleted.
Intentionally left blank.

SURVEILLANCE REQUIREMENTS

This SR ensures that the pressure in the SGIG System header is ≥ 80 psig. This ensures that the post-LOCA nitrogen pressure provided to the valve operators and valve seals is adequate for the SGIG System to perform its design function. The 24 hour Frequency was developed considering the importance of the SGIG System for maintaining the containment isolation function and combustible gas control function of valves supplied by the SGIG System. The 24 hour Frequency is also considered to be adequate to ensure timely detection of any breach in the SGIG System which would render the system incapable of performing its function.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.1.2

Verifying that the level in the CAD liquid nitrogen tank is ≥ 33 inches water column will ensure at least 7 days of post-LOCA CAD System and SGIG System operation for both units. This minimum volume of liquid nitrogen allows sufficient time after an accident to replenish the nitrogen supply for long term inerting. This is verified every 24 hours to ensure that the system is capable of performing its intended function when required. The 24 hour Frequency is based on operating experience, which has shown 24 hours to be an acceptable period to verify the liquid nitrogen supply and on the availability of other hydrogen mitigating systems.

SR 3.6.3.1.3

Verifying the correct alignment for manual, power operated, ... stem flow paths ... exist for ... valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing.

The information on this page has been deleted.
Intentionally left blank.

A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable because the CAD System is manually initiated. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day Frequency is appropriate because the valves are operated under procedural control, improper valve position would only affect a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.1.4

Verifying the correct alignment for each manual valve in the SGIG System required flow paths provides assurance that the proper flow paths exist for system operation. This SR does not apply to valves that are locked or otherwise secured in position, since these valves were verified to be in the correct position prior to locking or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable because the CAD System is manually initiated. This SR does not apply to valves that cannot be inadvertently misaligned such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.6.3.1.5

The information on this page has been deleted.
Intentionally left blank.

... instrument ... perform its ... quired pressure for valve operators and valve seals supported by the SGIG System. The 24 month Frequency was developed considering it is prudent that this Surveillance be performed only during a plant outage. Operating experience has shown that these components will usually pass this Surveillance when performed at the 24 month Frequency. Thus, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. Nuclear Regulatory Commission (NRC) Letter (SER) from John E. Stolz (Chief, Operating Reactors Branch (Division of Licensing)) to Edward G. Bauer, Jr., Vice President and General Counsel, Philadelphia Electric Company "Recombiner Capability Requirements of 10CFR50.44(c)(3)(ii) Generic Letter 84-09" dated 6/26/85.
2. 10 CFR Part 50.
3. Regulatory Guide 1.7, Revision 0.
4. UFSAR, Section 5.2.3.9.
5. Final Policy statement on Technical Specification Improvements July 22, 1993 (58 FR3913)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3.2 Primary Containment Oxygen Concentration

BASES

BACKGROUND

All nuclear reactors must be designed to withstand events that generate hydrogen either due to the zirconium metal water reaction in the core or due to radiolysis. The primary method to control hydrogen is to inert the primary containment. With the primary containment inert, that is, oxygen concentration < 4.0 volume percent (v/o), a combustible mixture cannot be present in the primary containment for any hydrogen concentration. The capability to inert the primary containment and maintain oxygen < 4.0 v/o works together with the Containment Atmospheric Dilution (CAD) System ~~(LCO 3.6.3.1, "Containment Atmospheric Dilution (CAD) System)~~ to provide redundant and diverse methods to mitigate events that produce hydrogen. For example, an event that rapidly generates hydrogen from zirconium metal water reaction will result in excessive hydrogen in primary containment, but oxygen concentration will remain < 4.0 v/o and no combustion can occur. Long term generation of both hydrogen and oxygen from radiolytic decomposition of water may eventually result in a combustible mixture in primary containment, except that the CAD System dilutes and removes hydrogen and oxygen gases faster than they can be produced from radiolysis and again no combustion can occur. This LCO ensures that oxygen concentration does not exceed 4.0 v/o during operation in the applicable conditions.

APPLICABLE SAFETY ANALYSES

The Reference 1 calculations assume that the primary containment is inerted when a Design Basis Accident loss of coolant accident occurs. Thus, the hydrogen assumed to be released to the primary containment as a result of metal water reaction in the reactor core will not produce combustible gas mixtures in the primary containment. Oxygen, which is subsequently generated by radiolytic decomposition of water, is diluted and removed by the CAD System more rapidly than it is produced.

Primary containment oxygen concentration satisfies Criterion 2 of the NRC Policy Statement.

(continued)