August 2, 2004

TVA-BFN-TS-435

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop: OWFN P1-35
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket No. 50-259
Tennessee Valley Authority	)	

BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1 – TECHNICAL SPECIFICATION (TS) CHANGE TS 435 – LIMITING CONDITION FOR OPERATION (LCO) TIME FOR CONTAINMENT ATMOSPHERE DILUTION (CAD) SUBSYSTEM INOPERABILITY

1. TVA letter, T.E. Abney to NRC, "Browns Ferry Nuclear Plant (BFN) - Units 2 and 3 - Technical Specifications (TS) Change 401 - Changes to Limiting Condition for Operation (LCO) Time for Containment Atmosphere Dilution (CAD) Subsystem Inoperability," March 15, 2000.

2. NRC letter, W.O. Long to J.A. Scalice "Browns Ferry, Units 2 and 3 - Amendments Re: Containment Air Dilution System Technical Specifications (TAC No. MA8471 AND MA8472)," May 24, 2000.

Pursuant to 10 CFR 50.90, TVA is submitting a request for an TS change (TS 435) to license DPR-33 for BFN Unit 1. The proposed TS change revises LCO 3.6.3.1, "CAD System," to provide seven days of continued operation with two inoperable CAD subsystems.

This TS change request is consistent with the provisions for the CAD system in NUREG-1433, Revision 3, Standard Technical Specifications General Electric Plants, BWR/4 Specifications. Regarding precedent, several other boiling water reactors, including Hatch 1, Duane Arnold, and Peach Bottom, all have TS which provide identical periods of continued operation with inoperable CAD subsystems. This change was previously proposed and approved for BFN Units 2 and 3 in References 1 and 2.

TVA has determined that there are no significant hazards considerations associated with the proposed TS change and that the change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and attachments to the Alabama State Department of Public Health.

The proposed TS change is necessary to support the restart of Unit 1. The change also ensures consistency with the current Units 2 and 3 TS. Therefore, TVA requests the amendment be approved by August 1, 2005 and that the implementation of the revised TS be within 60 days of NRC approval.

Enclosure 1 provides TVA's evaluation of the proposed TS changes. Enclosure 2 contains copies of the appropriate marked-up Unit 1 TS pages, showing the proposed changes. Enclosure 3 contains copies of the appropriate updated Unit 1 TS pages, which show the resulting changes.

There are no regulatory commitments associated with this submittal. If you have any questions about this amendment, please contact me at (256)729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 2, 2004.

Sincerely,

Original signed by
T. E. Abney
Manager of Licensing
and Industry Affairs

Enclosures:
1. TVA Evaluation of Proposed Change
2. Proposed Technical Specification Changes (mark-up)
3. Proposed Technical Specification Changes (clean pages)

cc: See Page 3

cc: (Enclosures)
State Health Officer
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ENCLOSURE 1

BROWNS FERRY NUCLEAR PLANT (BFN)
TECHNICAL SPECIFICATION (TS) CHANGE 435 – LIMITING CONDITION FOR OPERATION (LCO) TIME FOR CONTAINMENT ATMOSPHERE DILUTION (CAD) SUBSYSTEM INOPERABILITY

TVA EVALUATION OF PROPOSED CHANGE

INDEX

1.0 DESCRIPTION

This letter requests an amendment to license DPR-33 for BFN Unit 1. The proposed change to TS LCO 3.6.3.1, "CAD System," provides a completion time of seven days of continued reactor operation with two CAD subsystems inoperable. The current TS LCO requires reactor shutdown within 13 hours under LCO 3.0.3 when both CAD subsystems are inoperable.

This change is consistent with the BWR/4 Standard Technical Specifications (STS), NUREG-1433, Revision 3, for the CAD system. The change also ensures consistency with the current Units 2 and 3 TS. Therefore, TVA requests the amendment be approved by August 1, 2005.

2.0 PROPOSED CHANGE

The proposed change revises LCO 3.6.3.1, CAD System, to provide a completion time of seven days of continued reactor operation with two CAD subsystems inoperable. The specific changes are described below:

> Revise Unit 1 TS Page 3.6-40 to insert the following Actions 3.6.3.1.B.1 and 3.6.3.1.B.2 (The existing 3.6.3.1.B.1 will be renumbered to 3.6.3.1.C.1):

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	Two CAD subsystems inoperable	B.1	Verify by administrative means that the hydrogen control function is maintained.	1 hour AND once per 12 hours thereafter
		AND		
		B.2	Restore one CAD subsystem to OPERABLE status	7 days

Enclosure 2 contains copies of the appropriate marked-up Unit 1 TS pages, showing the proposed changes. Enclosure 3 contains copies of the appropriate updated Unit 1 TS pages, which show the resulting changes.

3.0 BACKGROUND

On March 15, 2000, TVA submitted an application to changes to the Units 2 and 3 Technical Specification LCO 3.6.3.1, “CAD System,” to provide a completion time of seven days of continued reactor operation with two CAD subsystems inoperable (Reference 1). NRC issued the requested amendment on May 24, 2000 (Reference 2). The overall content of this submittal is based on TVA’s original application for Units 2 and 3. Included at the end of this section is a comparison of the proposed change, reason for change, background information, and technical analysis submitted in support of this proposed amendment with the information provided by TVA and approved by NRC for the Units 2 and 3 license amendments. This section also contains a discussion of:

1. The reasons for the proposed Unit 1 amendment;

2. The CAD System and its design basis;

3. The BWR Owners’ Group evaluation of combustible gas control;

4. The requirement contained in STS;

5. TVA’s risk assessment for the proposed change;

3.1 Objective of Proposed Change

BFN Units 1, 2, and 3 share a common CAD system. The system is comprised of two redundant subsystems each of which contains an external liquid nitrogen storage tank and the piping, valving, instrumentation, and controls necessary to inject nitrogen gas to the primary containment of any of the BFN units. The current Unit 1 Technical Specifications provides for a 30-day LCO whenever one of the two redundant CAD subsystems becomes inoperable. No specific LCO is provided for the condition when both CAD subsystems are inoperable. Therefore, should both CAD subsystems become inoperable, the current TS would require that the unit be placed in MODE 3 within 13 hours in accordance with the requirements of LCO 3.0.3.

The current Unit 1 TS requirement for the shutdown of the unit, for a short-term CAD system inoperability, is disproportionate with the overall safety function of the CAD system. Therefore, a relaxation to the CAD system LCO to provide a limited 7-day time period of continued operation is being proposed. This change is consistent with BWR/4 STS which already provide for a 7-day Completion Time when both CAD subsystems are inoperable if an alternate hydrogen control function is maintained. For BFN, the containment inerting system provides the alternate means of hydrogen control.

The primary objective of this proposed TS change is to reduce the likelihood of the forced shutdown of the reactor(s) resulting from short-term loss of the CAD subsystems due to unanticipated maintenance problems. This would avoid the inherent risks associated with reactor shutdown activities resulting from maintenance issues that could be corrected in a timely manner.

Although it is not typical for both CAD systems to be inoperable, there is a reasonable probability this situation may occur, particularly during periods when one of the CAD subsystems is out of service for scheduled testing, or corrective or preventive maintenance. For this situation, with the existing TS, the invocation of LCO 3.0.3 for two inoperable CAD systems is very restrictive with regard to being able to return a subsystem to service or to perform unanticipated corrective maintenance within the 13-hour LCO. With the proposed 7-day completion time, it is more likely a subsystem could be returned to service or corrective maintenance be performed to remedy any likely CAD system equipment problem prior to exceeding the LCO.

Therefore, it is prudent to propose adoption of STS provisions for the CAD system to reduce the probability of a forced shutdown and the associated risk factors.

3.2 CAD System Description and Design Basis

During normal power operation, the containment inerting system is used to maintain the primary containment atmosphere at less than 4.0 percent oxygen by volume, with the balance in nitrogen. Following a potential loss-of-coolant accident (LOCA), hydrogen is postulated to evolve within the containment from metal-water reactions, and hydrogen and oxygen are produced by radiolysis of water. These are the only significant sources of hydrogen and oxygen. If the concentrations of hydrogen and oxygen were not controlled, a combustible gas mixture theoretically could be produced. To ensure a combustible gas mixture does not form, the oxygen concentration is kept below 5 percent by volume, and the hydrogen concentration is kept below 4 percent by volume by operation of the CAD system.

Assuming the analytic hydrogen and oxygen generation rates as specified in Safety Guide 7, *Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident*, the concentration of combustible gases in containment following a LOCA is controlled by the CAD system. This is accomplished by injecting nitrogen gas into the containment from one of two redundant CAD liquid nitrogen storage tanks to dilute any hydrogen or oxygen generated by the LOCA and by venting the containment atmosphere as necessary through the standby gas treatment system. Refer to Updated Final Safety Analysis Report (UFSAR) Subsection 5.2.3.8 for a discussion of the CAD systems and UFSAR Figures 5.2-7 and 5.2-8 for a flow diagram.

This system is capable of keeping the concentration of oxygen in the containment atmosphere below 5 percent and hydrogen below 4 percent. In the event that post-accident monitoring showed that hydrogen and oxygen generation rates were substantially below those specified in the Safety Guide, the CAD system could be operated as necessary to maintain either the hydrogen concentration below 4 percent or the oxygen concentration below 5 percent. The time required to produce significant amounts of oxygen through radiolysis is lengthy and in the LOCA analysis CAD operation is not required until hours after a LOCA.

The CAD system can also be used to provide a non-safety grade, backup pneumatic supply to the drywell control air system, primarily for the purpose of increasing the availability of long-term main steam relief valve (MSRV) operation for events such as those associated with fire protection. This control air backup capability is not addressed in the TS, and the Fire Protection program allows the use of alternate methods and/or compensatory measures such as nitrogen bottles in instances where normal drywell control air equipment is not available. For design basis considerations, selected MSRVs are equipped with safety grade accumulators which are designed to ensure each MSRV can be opened 5 times as discussed in UFSAR Section 4.4.5 on the Automatic Depressurization System description.

CAD Subsystem A provides a backup pneumatic source for operation of the Hardened Wetwell Vent valves and the torus vacuum breaker isolation valves. The current TS allows for a single CAD subsystem to be inoperable for 30 days, where, in the case of CAD Subsystem A, this backup function is not available. Therefore the requested TS LCO of allowing both CAD subsystems to be inoperable for 7-days does not extend the period that this backup function may be unavailable.

3.3 BWR Owners Group Evaluation Of Combustible Gas Control

The BWR Mark I Owners Group undertook a substantial study in response to the addition of the provisions in 10 CFR 50.44(c)(3) requiring recombiner capability for those light water reactors relying upon purge/repressurization systems as a primary means of hydrogen control. This study was published as NEDO-22155, Generation and Mitigation of Combustible Mixtures in Inerted BWR Mark I Containments, June 1982 (Reference 3). This NEDO concluded the oxygen generation rates assumed in Safety Guide 7 (subsequently Regulatory Guide 1.7) were overly conservative and maintaining containment inerted during operation was sufficient to provide combustible gas control.

Following review of this study, NRC issued Generic Letter 84-09 (Reference 4), which stated that the BWR Mark I plants affected by the recombiner rule (including BFN) did not need to rely on use of a safety grade purge/repressurization system (CAD) specified by 10 CFR 50.44(f) and (g) as a primary means of hydrogen control provided that three technical criteria were met.

These three criteria from GL 84-09 are summarized below:

1. The plant has TS LCOs requiring containment atmosphere oxygen concentration to be maintained less than 4% by volume;

2. The plant has only nitrogen or recycled containment atmosphere for use in all pneumatic control systems within containment, and;

3. There are no potential sources of oxygen in containment other than radiolysis of the reactor coolant.

BFN is designed and operated in accordance with these criteria as follows:

1. The BFN primary containment is maintained below 4 percent oxygen by volume during normal operation in accordance with Technical Specification LCO 3.6.3.2 using nitrogen gas from the containment inerting system;

2. For Unit 1 all pneumatic equipment located inside the primary containment utilizes nitrogen from the containment inerting system with a backup from the CAD system as its pneumatic supply. Therefore, station control air is not used to provide the pneumatic supply to containment equipment; and

3. Pathways which could introduce oxygen into the primary containment are isolated during normal operation.

NRC issued a Safety Evaluation Report (SER) dated July 6, 1989, which evaluated NEDO-22155 (Reference 5). The SER concluded, in some areas, the NEDO-22155 analysis under-predicts oxygen radiolysis generation rates. However, the SER also stated Regulatory Guide 1.7 (which superseded Safety Guide 7) is conservative in its overall oxygen generation prediction. Therefore, a technical basis exists that the AEC Safety Guide 7 oxygen generation rates assumed in the BFN LOCA analysis are more conservative than necessary. This provides additional justification for a TS allowance for a short period of CAD system inoperability.

3.4 Requirement of Standard Technical Specifications

The BWR/4 STS, NUREG-1433, Revision 3, provide a 7-day continued operation allowance with two CAD systems inoperable if an alternate hydrogen control system is verified available. For BFN, the normal containment inerting system provides this hydrogen control function.

The normal containment inerting system is used during the initial purging of the primary containment to establish an inerted containment, and it also provides a supply of make up nitrogen during reactor operation. The system consists of a liquid nitrogen storage tank, a purge vaporizer, a makeup vaporizer, pressure-reducing valves and controllers, and instrumentation, valves, and associated piping. Refer to the UFSAR 5.2-6a series of figures for flow diagrams of the system.

The normal inerting system supplies nitrogen from a common onsite storage tank through a common purge vaporizer or makeup vaporizer where the liquid nitrogen is converted to the gaseous state. The gaseous nitrogen then flows through the purge or make up pressure-reducing valves and flow meters into the torus or drywell.

In the event of a LOCA, the Core Standby Cooling Systems are designed to prevent significant fuel damage and the generation of significant quantities of hydrogen. Should fuel damage be postulated, and hydrogen and oxygen be generated per AEC Safety Guide 7 assumptions, the inerted primary containment atmosphere ensures that the oxygen concentration is too low to react with this hydrogen gas. Hence, any oxygen which can react must be generated from the radiolytic decomposition of water under post-LOCA conditions.

The primary containment inerting system can be used to provide nitrogen dilution in a manner analogous to the CAD system. In fact, the BFN Emergency Operating Instructions (EOIs) preferentially direct the use of the normal primary containment inerting system for purging and venting during emergency conditions. The EOI procedural policy, which is in accordance with industry emergency procedure guidelines, recognizes the inerting system is well suited for use under emergency conditions since it is routinely used for purge and vent operations under normal operations. Under this procedural direction, CAD serves as the backup method rather than the primary means to mitigate any combustible mixture formation. Therefore, the proposed TS change is consistent with this EOI usage of the normal inerting system by requiring it to be functional as the alternate hydrogen control function during any period of reactor operation if both CAD subsystems are inoperable. This is consistent with STS provisions for CAD.

3.5 Risk Assessment of the Proposed Change

In a qualitative sense, the Browns Ferry Probabilistic Safety Assessment (PSA) baseline Core Damage Frequency (CDF) values for Unit 1 indicate a low probability per reactor year of a core-damaging event. Since CAD's formal design function is not needed unless core damage has already occurred, and the core damage probability is low, a low probability of needing CAD for its design use can be observed directly from the baseline CDF value. Since the baseline CDF value is based on an annual time frame, and the proposed LCO under discussion is only a small part of a year, these low probabilities can be reduced even further during an LCO period.

No planned maintenance or test activities remove both CAD systems from service. Therefore, the proposed TS is requested as a contingency provision for situations when both subsystems become inoperable due to unexpected circumstances. The most likely circumstance for this situation would be an unexpected maintenance problem on a CAD subsystem while the other subsystem was out of service for preventive or corrective maintenance.

The CAD design basis oxygen control function is not required until well after a hydrogen producing LOCA event has occurred because of the time necessary for radiolysis to produce sufficient oxygen inside primary containment. Since the safety-related design function of CAD is not required prior to a core damaging event (the interval evaluated by the BFN Level I PSA), it follows this CAD function cannot impact CDF values.

BFN design basis calculations indicate the CAD function would not be needed sooner than 30 hours post-accident under anticipated containment conditions. The BFN Level II PSA evaluation for large early release frequency (LERF) evaluates the first 24 hours post-accident. Therefore, the availability of the CAD function does not affect LERF.

Also, as noted earlier, the proposed LCO will also require the containment inerting system be verified available if both CAD subsystems are inoperable. The containment inerting system, although not safety-grade, can provide the analogous combustible gas control function as CAD. In the BFN symptom based EOIs, it is used in several contingencies to provide containment inerting functions. The inerting system tank, as well as the CAD tanks, is located external to the reactor building and can be easily accessed. Therefore, it is easy to refill the inerting tank or CAD tanks using nitrogen tank trucks as contingency options.

The CAD system non-safety function of supplying backup pneumatic motive energy for long-term MSRV operation has nominal relevance to PSA CDF calculations, because MSRV operation can affect CDF. However, the PSA modeling shows there is no significant change to the Unit 1 CDF when the CAD backup pneumatic supply function is assumed to be either 100% available or never available (i.e., risk-reduction worth or risk-achievement worth values are not significant).

In summary, the addition of TS provisions for the 7-day CAD LCO has little impact on risk. Anticipated use of the LCO is as a contingency specification for unexpected maintenance problems on the CAD system. The CAD system is monitored under the BFN Maintenance Rule Program, and CAD subsystem unavailability is unlikely to increase as a result of issue of the proposed Technical Specification change. A longer LCO would provide an opportunity to remedy the system problem and return a subsystem to service in an orderly manner. This would avoid the inherent transition risk associated with an expedited shutdown of multiple units. Therefore, the proposed TS change is considered beneficial with regard to risk considerations.

3.6 Comparison with Previous Technical Specification Changes for Unit 2 and 3

TVA has compared the proposed change, reason for change, background information, and technical analysis submitted in support of this proposed amendment with the information provided by TVA and approved by NRC in References 1 and 2 for the revision to the Units 2 and 3 TS. The comparison for each of these areas is provided below:

- The proposed change to the Unit 1 TS is the same change as proposed and approved for Units 2 and 3.

- The underlying reason for the Unit 1 TS change is the same as previously submitted for the Units 2 and 3 TS change (i.e., to reduce the likelihood of the forced shutdown of the reactor due to the short-term loss of the CAD subsystem). In addition, TVA needs to maximize consistency between the Unit 1 and Units 2 and 3 TS, operations and maintenance practices prior to restarting Unit 1.

- The background information provided in support of the Unit 1 TS change incorporates the same elements previously submitted in support of the Units 2 and 3 TS change.

- The technical analysis submitted for this Unit 1 TS change incorporates the same elements previously submitted in support of the previous TS changes for Units 2 and 3.

4.0 TECHNICAL ANALYSIS

The BFN Unit 1 TS currently require a shutdown to Mode 3 under the conditions of LCO 3.0.3 if both CAD subsystems become inoperable. The low probability of a fuel-damaging accident occurring during a 7-day period, the fact CAD is not required immediately post-accident, and the availability of oxygen mitigation systems other than CAD which are preferred under the EOIs make the requested TS change acceptable. The proposed change is also consistent with STS. Also, previous regulatory studies (NEDO-22155) concluded the AEC oxygen generation source terms are conservative, and the inerted containment provides the chief protection against the creation of combustible mixtures in the primary containment atmosphere.

A review of STS approved at other BWRs of similar design, such as Peach Bottom Units 2 and 3, and Hatch Unit 1, found 7 days or greater LCO times were typical for conditions where both CAD subsystems were inoperable. The justification provided at these plants is similar to this submittal, i.e., the risk of a LOCA during the LCO interval is small, CAD usage is not immediately required even should a fuel-damaging accident occur, and alternate hydrogen control capability exists within the plant design. As noted previously, 7-days are provided in STS for plants with an alternate hydrogen control function such as Browns Ferry.

The technical analysis demonstrates a completion time of seven days of continued reactor operation with two CAD subsystems inoperable maintains an adequate defense in depth and sufficient safety margins. The resulting increases in core damage frequency and risk are small.

5.0 REGULATORY SAFETY ANALYSIS

The Tennessee Valley Authority (TVA) is submitting an amendment request to license DPR-33 for the Browns Ferry Nuclear Plant (BFN) Unit 1. The proposed Technical Specification (TS) change revises Limiting Condition for Operation (LCO) 3.6.3.1 to permit seven days of continued operation with two inoperable Containment Atmospheric Dilution (CAD) subsystems.

5.1 No Significant Hazards Consideration

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment", as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The safety-related function of the CAD system is to mitigate the effects of a loss-of-coolant-accident (LOCA) by limiting the volumetric concentration of oxygen in the primary containment atmosphere. The CAD System is not an event initiator, therefore, the probability of the occurrence of an accident is not affected by this proposed Technical Specification change. Emergency procedures preferentially use the normal containment inerting system to provide post-accident vent and purge capability, with the CAD system only serving in a backup role to this system. Hence, in the event of the inoperability of both CAD subsystems, the proposed TS require the normal containment inerting system to be verified available as an alternate oxygen control means. Therefore, the proposed TS 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 does not introduce new equipment, which could create a new or different kind of accident. This proposed change does not result in any changes to the CAD equipment design or capabilities or to the operation of the plant. No new external threats, release pathways, or equipment failure modes are created. Therefore, the implementation of the proposed change will not create a possibility for an accident of a new or different type than those previously evaluated.

3.0 Does the proposed change involve a significant reduction in a margin of safety?

Response: No

As stated in GL 84-09, a Mark I type boiling water reactor (BWR) plant does not rely upon purge/repressurization systems such as CAD as its primary means of hydrogen control when the unit is operated in accordance with certain technical criteria. The BFN units are operated in accordance with these criteria. The BFN Unit 1 containment is inerted with nitrogen during normal operation, nitrogen from the containment inerting system with a backup from the CAD system is used for pneumatically operated components inside containment, and there are no potential sources of oxygen generation inside containment other than the radiolytic decomposition of water. The system preferred by the Emergency Operating Instructions (EOIs) for oxygen control post-accident is the normal primary containment inerting system. Because the probability of an accident involving hydrogen and oxygen production is small, CAD is not the primary system used to mitigate the creation of combustible containment atmosphere mixtures, and because the requested LCO where both CAD subsystems is inoperable is not long, no significant reduction in the margin of safety is associated with this proposed amendment.

Based on the above, TVA concludes that the proposed amendment presents no 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.

5.2 Applicable Regulatory Requirements/Criteria

General Design Criterion 41 and Title 10, Code of Federal Regulations (10 CFR), Part 50, Section 44, require that reactor facilities be provided with a means for post-accident control of combustible gases in the containment. To meet these requirements, the BFN facilities are provided with a shared, redundant (i.e., two trains or "subsystems"), safety-grade CAD system as described in Section 5.2.6 of the UFSAR and reported in the staff's December 21, 1972 Safety Evaluation Supplement No. 1.

The CAD system is classified as an engineered safety feature. During a postulated design basis LOCA, hydrogen, a combustible gas would be generated by metal-water reaction, radiolysis and corrosion. If hydrogen and oxygen are present in the containment at sufficient concentration the containment barrier and equipment within the containment are threatened by the possibility of excessive temperature and pressure due to hydrogen combustion. The CAD system is designed to provide the capability to prevent a combustible hydrogen/oxygen mixture from forming during a design basis LOCA. Assuming the hydrogen and oxygen generation rates as specified in Regulatory Guide 1.7 "Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident," the concentration of combustible gases in containment following a LOCA can be controlled by the CAD system. This is accomplished by maintaining an inert containment during normal operation, and, in the event of an accident, using the CAD system to inject nitrogen gas into the containment to dilute any oxygen generated by the LOCA, venting the containment atmosphere as necessary, for pressure control, through the standby gas treatment system.

The CAD system can also be used to provide a non-safety grade, backup pneumatic supply to the drywell pneumatic system, primarily for the purpose of increasing the availability of long-term MSRV operation for beyond design basis events such as those associated with fire protection. This pneumatic backup capability is not addressed in the Technical Specifications, and the Fire Protection program allows the use of alternate methods and/or compensatory measures such as nitrogen bottles in instances where the normal drywell pneumatic supply is not available. Selected MSRVs are equipped with safety grade accumulators which are designed to ensure each MSRV can be opened five times as discussed in UFSAR Section 4.4.5 on the Automatic Depressurization System description.

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 the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

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

7.0 REFERENCES

3. TVA letter, T.E. Abney to NRC, "Browns Ferry Nuclear Plant (BFN) - Units 2 and 3 - Technical Specifications (TS) Change 401 - Changes to Limiting Condition for Operation (LCO) Time for Containment Atmosphere Dilution (CAD) Subsystem Inoperability," March 15, 2000.

4. NRC letter, W.O. Long to J.A. Scalice "Browns Ferry, Units 2 and 3 - Amendments Re: Containment Air Dilution System Technical Specifications (TAC No. MA8471 AND MA8472)," May 24, 2000.

5. General Electric report, NEDO-22155, Generation and Mitigation of Combustible Mixtures in Inerted BWR Mark I Containments, June 1982.

6. NRC Generic Letter 84-09, May 8, 1984, Recombiner Capability Requirements of 10 CFR 50.44(c)(3)(ii).

7. NRC SER on General Electric Company's Methodology for Determining Rates of Generation of Oxygen by Radiolytic Decomposition (NEDO 22155) - July 6, 1989.

ENCLOSURE 2

BROWNS FERRY NUCLEAR PLANT
TECHNICAL SPECIFICATION CHANGE 435 –
LIMITING CONDITION FOR OPERATION (LCO) TIME FOR CONTAINMENT ATMOSPHERE DILUTION (CAD) SUBSYSTEM INOPERABILITY

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

3.6 CONTAINMENT SYSTEMS

3.6.3.1 Containment Atmosphere Dilution (CAD) System

LCO 3.6.3.1 Two CAD subsystems shall be OPERABLE.

[note: new text below is shown in **bold** type in the shaded areas]

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CAD subsystem inoperable.	A.1 Restore CAD subsystem to OPERABLE status.	30 days
B. Two CAD subsystems inoperable	**B.1 Verify by administrative means that the hydrogen control function is maintained.** **AND** **B.2 Restore one CAD subsystem to OPERABLE status**	**1 hour** **AND** **once per 12 hours thereafter** **7 days**
~~B.~~ C. Required Action and associated Completion Time not met.	~~B.1~~ C.1 Be in MODE 3.	12 hours

ENCLOSURE 3

BROWNS FERRY NUCLEAR PLANT
TECHNICAL SPECIFICATION CHANGE 435 –
LIMITING CONDITION FOR OPERATION (LCO) TIME FOR
CONTAINMENT ATMOSPHERE DILUTION (CAD) SUBSYSTEM
INOPERABILITY

PROPOSED TECHNICAL SPECIFICATION CHANGES (CLEAN PAGES)

3.6 CONTAINMENT SYSTEMS

3.6.3.1 Containment Atmosphere Dilution (CAD) System

LCO 3.6.3.1 Two CAD subsystems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CAD subsystem inoperable.	A.1	--------------NOTE------------ LCO 3.0.4 is not applicable. ---------------------------------- Restore CAD subsystem to OPERABLE status.	 30 days
B. Two CAD subsystems inoperable	B.1	Verify by administrative means that the hydrogen control function is maintained.	1 hour AND once per 12 hours thereafter
	AND		
	B.2	Restore one CAD subsystem to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	12 hours