AmerenUE
Callaway Plant

PO Box 620
Fulton, MO 65251

June 29, 2006

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

ULNRC-05307

Ameren UE

Ladies and Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
REVISION TO TECHNICAL SPECIFICATION 3.4.15,
"RCS LEAKAGE DETECTION INSTRUMENTATION"

Ref: 1. ULNRC-05197, dated August 26, 2005.
2. ULNRC-05242, dated December 16, 2005.
3. NRC letter dated May 16, 2006, from J. Donohew, NRC, to C. D. Naslund, AmerenUE.

Reference 1) provided Union Electric Company (AmerenUE) application requesting approval of a change to the Reactor Coolant System (RCS) leak detection instrumentation system methodology. Reference 1) proposed to revise the Technical Specification (TS) Bases and the Final Safety Analysis Report (FSAR) to clarify the requirements of the containment atmosphere gaseous radioactivity monitor with regard to its RCS leak detection capability. Reference 2) provided responses to an electronic mail request for additional information. Reference 3) provided the Nuclear Regulatory Commission's (NRC's) position that the instrumentation listed in TS 3.4.15, "RCS Leakage Detection Instrumentation," as a method for meeting Part 50, Appendix A, General Design Criteria (GDC) 30 of Title 10 of the Code of Federal Regulation, should be capable of detecting a 1 gpm RCS leak rate in 1 hour for realistic or normal plant conditions. Reference 3 requests that AmerenUE either provide justification that the containment atmosphere gaseous radioactivity monitor can meet this position or revise Reference 1) to remove the gaseous radioactivity monitor from TS 3.4.15. This submittal proposes to remove the gaseous radioactivity monitor from TS 3.4.15 and therefore, supersedes Reference 1) and Reference 2).

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The proposed changes to TS 3.4.15 are consistent with NUREG-1431, Revision 3.1, "Standard Technical Specifications Westinghouse Plants." Attachments 1 through 4 provide the evaluation, Markup of Technical Specifications, Retyped Technical Specifications, and Proposed Technical Specification (TS) Bases Changes, respectively, in support of this amendment request. Attachment 4 is provided for information only. Final TS Bases changes will be processed under our program for updates per TS 5.5.14, "Technical Specification Bases Control Program," at the time this amendment is implemented.

This letter identifies actions committed to by AmerenUE and the Callaway Plant in this submittal. Other statements are provided for information purposes and are not considered to be commitments. A summary of the regulatory commitments made in this submittal is provided in Attachment 5.

The Callaway Plant Onsite Review Committee and a subcommittee of the Nuclear Safety Review Board have reviewed this amendment application. In addition, it has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment

AmerenUE requests approval of this proposed License Amendment by September 30, 2006. The amendment will be implemented within 90 days of approval.

In accordance with 10 CFR 50.91, a copy of this amendment application is being provided to the designated Missouri State official. If you have any questions on this amendment application, please contact Mr. David Shafer at (314) 554-3104.

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

Sincerely,

Executed on: June 29, 2006

Keith D. Young
Manager - Regulatory Affairs

Attachments: 1 - Evaluation
2 - Markup of Technical Specifications
3 - Retype Technical Specifications
4 - Proposed Technical Specification Bases Changes (for information only)
5.-. List of Commitments

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ATTACHMENT 1

EVALUATION

EVALUATION

1.0 DESCRIPTION

This amendment application revises Technical Specification (TS) 3.4.15, "RCS Leakage Detection Instrumentation," to remove the containment atmosphere gaseous radioactivity monitor.

Evaluations have shown that the pre-existing containment radioactive gaseous background levels for which reliable detection is possible is dependent upon reactor power level, percent failed fuel, and containment purge operation. With primary coolant concentrations less than background equilibrium levels, such as during startup and operation with no fuel defects, the increase in detector count rate due to leakage will be partially masked by the statistical variation of the minimum detector background count rate, rendering reliable detection of a 1 gpm leak in one hour uncertain.

2.0 PROPOSED CHANGES

Proposed TS 3.4.15 changes include:

- Revised LCO 3.4.15 to remove the containment atmosphere gaseous radioactivity monitor.
- Revised Condition B Required Actions to provide an alternative to restoring the required containment atmosphere particulate radioactivity monitor to OPERABLE status. The alternative is the verification that the containment air cooler condensate monitoring system is OPERABLE.
- Addition of new Condition C for required containment cooler condensate monitoring system inoperable. Existing Conditions C, D, and E are relettered.
- Revised new Condition D to remove the containment atmosphere gaseous radioactivity monitor. Existing Required Actions C.1.1 and C.1.2 are deleted.
- Revised Surveillance Requirement (SR) 3.4.15.1, SR 3.4.15.2, and SR 3.4.15.4 to remove the containment atmosphere gaseous radioactivity monitor.

All of the proposed changes to TS 3.4.15 above are consistent with NUREG-1431, Revision 3.1, "Standard Technical Specifications Westinghouse Plants."

Proposed revisions to the TS Bases are also included in this application. The changes to the affected TS Bases pages will be incorporated in accordance with TS 5.5.14, "Technical Specifications (TS) Bases Control Program."

3.0 BACKGROUND

On October 16, 2003, the Callaway Plant-Nuclear Regulatory Commission (NRC) Integrated Inspection Report 05000483/2003005 issued non-cited violation (NCV) 50-483/0305-04 for failure to assure that applicable regulatory requirements and the design basis for the containment radiation gas monitors were correctly translated into plant calculation used to determine setpoints. This issue was entered into and evaluated under our corrective action program (CAR 200302806). That evaluation determined that due to improved fuel integrity and the resultant reduced RCS radioactivity levels, the containment atmosphere gaseous radioactivity monitors have become less effective for RCS leakage detection. The evaluation concluded that the capability of the containment atmosphere gaseous radioactivity monitors can no longer promptly detect a small RCS leak under all operating conditions. On November 16, 2003, Callaway administratively placed the containment atmosphere gaseous radioactivity monitors on the equipment out of service log (ESOL) and considered them inoperable for the purpose meeting LCO 3.4.15, pending resolution of this issue. Considering the gaseous radioactivity monitors inoperable was based on the regulatory concern identified in the inspection report and ensuring compliance with LCO 3.4.15. The monitors were designed consistent with the guidance of Regulatory Guide 1.45 for having sensitivity capable of detecting a 1 gpm leak in 1 hour based on a primary coolant radioactivity concentration assumption utilized in the plant environmental report.

AmerenUE submitted a license amendment request pursuant to criterion viii of 10 CFR 50.59(c)(2) on August 26, 2005 (Reference 3) that proposed changes to the TS Bases and FSAR to clarify the requirements of the containment atmosphere gaseous radioactivity monitor with regard to its RCS leak detection capability and provide clarification that the monitor can be considered OPERABLE (in compliance with LCO 3.4.15) during all applicable MODES even when reactor coolant radioactivity levels are below the levels assumed in the original licensing basis. On May 16, 2006 (Reference 4), the NRC provided a letter concerning the proposed amendment request that states, in part:

> "It has always been the NRC's position that the instrumentation listed in TS 3.4.15 as a method for meeting Part 50, Appendix A, General Design Criterion (GDC) 30 of Title 10 of the Code of Federal Regulations, "Quality of reactor coolant pressure boundary," should be capable of detecting a 1 gpm RCS leakrate in 1 hour for realistic or normal plant conditions. In the NRC Standard Review Plan 5.2.5,"Reactor Coolant Pressure Boundary Leakage Detection," it is stated that RG 1.45 is an acceptable method to meet GDC 30 for RCS leak detection, and, in 1973, when RG 1.45 was issued, the underlying assumption was that the acceptable detection methods would have that detection capability for the normal plant conditions that existed at that time. The containment atmosphere gaseous radioactivity monitor was listed in RG 1.45 because the normal RCS radioactivity concentrations at that time were such that this monitor could detect a 1 gpm RCS leakrate in 1 hour. Now that normal plant conditions have much lower RCS radioactivity concentrations, the monitor cannot meet this criterion. Therefore, the RCS detection instrumentation in TS 3.4.15 should be capable of promptly detecting RCS leakage for the current plant conditions."

The NRC letter dated May 16, 2006 requested that AmerenUE either provide justification that the containment atmosphere gaseous radioactivity monitor can meet the above criterion or revise the license amendment request to remove the monitor from TS 3.4.15. As identified in Reference 3, the containment gaseous radioactivity monitor cannot be assured to respond within 1 hour to a 1 gpm leak with low RCS activity levels. In addition, although low RCS activity levels have become the standard, there is a possibility that they may change. Predicting changing conditions and changing technical specifications is impractical. As such, AmerenUE will pursue the removal of the gaseous radioactivity monitor from TS 3.4.15.

Leak Detection System Design

The diverse reactor coolant pressure boundary leakage detection system consists of the containment sump level and flow monitoring system, the containment air particulate monitoring system, the containment radioactive gas monitoring system, and the containment cooler condensate measuring system. The sump level and flow monitoring system indicates leakage by monitoring increases in sump level. The containment cooler condensate monitoring system detects leakage from the release of steam or water to the containment atmosphere. The air particulate and radioactive gas monitoring systems detect leakage from the release of radioactive materials to the containment atmosphere. OPERABILITY requirements for these systems are specified in the plant TSs. Each of these systems is described in further detail below.

In addition to the above systems, the containment humidity measuring system is also available as an indirect indication of leakage to the containment. Further, reactor coolant pressure boundary leakage can also be indicated by increasing charging pump flow rate compared with reactor coolant system inventory changes and by unscheduled increases in reactor makeup water usage.

CONTAINMENT SUMP LEVEL AND FLOW MONITORING SYSTEM - Since a leak in the primary system would result in reactor coolant flowing into the containment normal or instrument tunnel sumps, leakage would be indicated by a level increase in the sumps. Indication of increasing sump level is transmitted from the sump to the control room level indicator by means of a sump level transmitter. The system provides measurements of low leakages by monitoring level increase versus time. A sensitivity of 1 gpm in 1 hour can be achieved assuming that the water from the leak is collected in the sump.

The minimum detectable change in the containment normal sump level is 5 gallons and in the instrument tunnel sump level is 15 gallons. When the instrument tunnel sump is completely dry, the minimum detectable level change is 25 gallons. The levels are scanned by the Plant computer once per 5 minutes, and the normal background rate of increase in sump level is subtracted to determine the leakage rate. The actual reactor coolant leakage rate can be established from the increase above the normal rate of change of sump level after consideration of 35 percent of the high temperature leakage which initially evaporates but may be condensed by the containment coolers and then is routed to the sump. A check of other instrumentation would be required to eliminate possible leakage from nonradioactive systems as a cause of an increase in sump level.

CONTAINMENT AIR PARTICULATE MONITOR - An air sample is drawn outside the containment into a closed system by a sample pump and is then consecutively passed through a particulate filter with detector, an iodine filter with detector, and a gaseous monitor chamber with detector. The particulate monitor has a range of 10^{-12} to 10^{-7} μCi/cc and a minimum detectable concentration of 10^{-11} μCi/cc.

Particulate activity is determined from the containment free volume and the coolant fission and corrosion product particulate activity concentrations. Any increase of more than two standard deviations above the count rate for background would indicate a possible leak. The total particulate activity concentration above background, due to an abnormal leak and natural decay, increases almost linearly with time for the first several hours after the beginning of a leak. With 0.1-percent failed fuel, containment background airborne particulate radioactivity equivalent to 10^{-4} percent/day, and a partition factor equal to 0.2, a 1-gpm leak would be detected in 1 hour.

CONTAINMENT COOLER CONDENSATE MONITORING SYSTEM - The condensate monitoring system permits measurements of the liquid runoff from the containment cooler units. It consists of a containment cooler drain collection header, a vertical standpipe, valving, and standpipe level instrumentation for each cooler.

The condensate flow rate is a function of containment humidity, essential service water temperature leaving the coolers, and containment purge rate. The water vapor dispersed by a 1 gpm leak is much greater than the water vapor brought in with the outside air. Air brought in from the outside is heated to 50°F before it enters the containment.

After the air enters the containment, it is heated to 100-120°F so that the relative humidity drops. The water vapor brought in with the outside air does not build up in the containment. Level changes of as little as 0.25 inches in the cooler condensate standpipes can be detected. Increases in the condensation rates over normal background are monitored by the Plant computer based upon level checks each minute in order to determine the unidentified leakage. A sensitivity of 1 gpm in 1 hour can be achieved with cold essential service water temperature to the containment coolers or with initial background leakage.

CONTAINMENT GASEOUS RADIOACTIVITY MONITOR - The containment gaseous radioactivity monitor determines gaseous radioactivity in the containment by monitoring continuous air samples from the containment atmosphere. After passing through the gas monitor, the sample is returned via the closed system to the containment atmosphere. The sample is continuously mixed in a fixed, shielded volume where its activity is monitored. The monitor has a range of 10^{-7} to 10^{-2} μCi/cc and a minimum detectable concentration of 2×10^{-7} μCi/cc.

Gaseous radioactivity is determined from the containment free volume and the gaseous activity concentration of the reactor coolant. Any increase more than two standard deviations above the count rate for background would indicate a possible leak. The total gaseous activity level above background (after 1 year of normal operation) increases almost linearly for the first several hours after the beginning of the leak. With 0.1-percent failed fuel, containment background airborne

gaseous radioactivity equivalent to 1 percent/day, and a partition factor equal to 1 (NUREG-0017 assumptions), a 1-gpm leak would be detected within 1 hour.

Need for the Amendment

Although the detection capabilities of the containment gaseous radioactivity monitor are consistent with its design basis, the level of radioactivity in the reactor coolant at Callaway has become much lower than what is assumed in the original FSAR analysis. As such, the containment atmosphere gaseous radioactivity monitors be assured to respond within 1 hour to a 1 gpm leak with low RCS activity levels.

The NRC letter dated May 16, 2006 requested that AmerenUE either provide justification that the containment atmosphere gaseous radioactivity monitor can meet the NRC position of 1 gpm in 1 hour under normal plant conditions or revise the license amendment request to remove the monitor from TS 3.4.15. As identified in Reference 3, the containment gaseous radioactivity monitor will not respond within 1 hour to a 1 gpm leak with low RCS activity levels. As such, a license amendment is required for the removal of the gaseous radioactivity monitor from TS 3.4.15.

4.0 TECHNICAL ANALYSIS

RCS leakage detection requirements are given in TS 3.4.15 which requires the following RCS leakage detection instrumentation to be OPERABLE:

a. The containment sump level and flow monitoring system;
b. One containment atmosphere particulate radioactive monitor; and
c. The containment cooler condensate monitoring system or one containment atmosphere gaseous radioactivity monitor.

The Bases for TS 3.4.15 state that GDC 30 of Appendix A to 10 CFR 50 requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide 1.45 describes acceptable methods for selecting leakage detection systems. In addition the Bases discusses that leakage detection systems must have the capability to detect significant reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure.

The detection of RCS leakage using radiation monitors is affected by the type and quantity of isotopes that are contained in the reactor coolant and the background level of radiation affecting/influencing the detectors. Regulatory Guide 1.45 guidance on analyzing the sensitivity of radiation monitors used for RCS leakage detection recommends that a realistic primary coolant radioactivity concentration assumption be used. The Regulatory Guide further defines the realistic primary coolant concentration as the values used in the plant environmental report. For Callaway these concentration values are based on a 0.12% fuel defect from the Callaway Plant Environmental Report - Operating Licensing Stage (Reference 5). With the level of

radioactivity in the reactor coolant assumed in the Callaway Plant Environmental Report – Operating Licensing Stage, the containment atmosphere particulate and gaseous radioactivity detectors are capable of detecting a one gpm leak in one hour. However, operational history of the plant has shown the level of radioactivity in the reactor coolant with no fuel defects is much lower than what is assumed in the FSAR. The regulatory guide acknowledges the limitations of radiation monitoring for leak detection when the RCS activity is low. Further, the regulatory guide recommends a sensitivity of 1×10^{-6} for gaseous radioactivity monitors used for leak detection. The existing containment atmosphere gaseous radioactivity channel has a sensitivity of 2×10^{-7} and a range of 10^{-7} to 10^{-2} μCi/cc, which meets the criteria specified in Regulatory Guide 1.45.

Given the current level of radioactivity in the reactor coolant at Callaway with no or minor fuel cladding defects, evaluation has shown that the containment atmosphere gaseous radioactivity monitors would not promptly detect a one gpm leak in one hour. This conclusion is based on a realistic nominal detector background level, with the typical RCS gaseous activity associated with no fuel cladding defects. For these lower RCS activity levels, the increase in detector count rate due to leakage will be partially masked by the statistical variation of the minimum detector background count rate, rendering reliable detection of a 1 gpm leak in one hour uncertain. At elevated RCS activity/failed fuel conditions as discussed in Regulatory Guide 1.45, a one gpm leak would be detectable within one hour, even at higher detector background.

Regulatory Guide 1.45, Section B, discusses the selection of diverse leak detection methods given that the methods differ in sensitivity and response time. Prudent selection of detection methods should include sufficient systems to assure effective monitoring during periods when some detection systems may be ineffective or inoperable.

The proposed changes to TS 3.4.15 are consistent with NUREG-1431, Revision 3.1, "Standard Technical Specifications Westinghouse Plants." Condition B is revised to add a new Required Action to provide an alternative to restoring the required containment atmosphere particulate radioactivity monitor to OPERABLE status. The alternative is the verification that the containment air cooler condensate monitoring system is OPERABLE. This change is acceptable based on the containment air cooler condensate monitoring system providing indication of leakage together with either grab samples of containment atmosphere or performance of water inventory balance in accordance with SR 3.4.13.1 will provide information that is adequate for leak detection With the deletion of the containment atmosphere gaseous radioactivity monitor from the LCO and Conditions, a new Condition C is added for the required containment cooler condensate system being inoperable. The Required Actions for new Condition C require the performance of SR 3.4.15.1 or a water inventory balance in accordance with SR 3.4.13.1. The Required Action to perform a CHANNEL CHECK or water inventory balance is acceptable based on the availability of other diverse means to detect leakage and the impracticality of containment entries at power for repairs.

Impact on Leak Before Break Analysis for Callaway

In light of the RCS leakage detection capabilities of the containment atmosphere gaseous radioactivity monitors described above, the technical bases for applying leak-before-break (LBB) analyses to the Callaway Plant is still valid due to the selection of diverse leak detection methods. The LBB approach is the application of fracture mechanics technology to demonstrate that high energy piping is very unlikely to experience catastrophic ruptures or failures. The NRC LBB guidance is provided in NUREG-1061, "Report of the U.S. Nuclear Regulatory Commission Piping Review Committee," Volume 3 (Reference 7.1), "Evaluation of Potential for Pipe Breaks," requires the following criteria to be satisfied: 1) the leakage flaw size should be large enough so that the leakage is assured of detection with at least a margin of 10 using the minimum installed leak detection capability when the pipe is subjected to normal operational loads; 2) under normal plus safe shutdown earthquake (SSE) loads there should be a margin of 2.0 between the leakage size flaw and the critical-size flaw which could propagate to piping failure to account for the uncertainties inherent in the analyses and the leakage detection capability; and 3) flaw stability must be demonstrated. In addition, NUREG-1061, Volume 3, specifies that the RCS leakage detection capability should meet the criteria established in Regulatory Guide 1.45.

As stated in NUREG-1061, Volume 3, licensees and applicants have the option of requesting a decrease in leakage margin provided they could confirm that their leakage detection systems are sufficiently reliable, redundant, diverse, and sensitive. The basis for the NRC's approval of previous LBB analysis for the Callaway Plant continues to be supported by the overall RCS leakage detection capability of the diverse methods described in Section 3.0 above.

In summary, while the proposed amendment removes the gaseous channel from LCO 3.4.15, the remaining leakage detection systems will provide adequate capability to promptly detect RCS leakage. The proposed amendment continues to require, in the TS, diverse means of leakage detection equipment with capability to promptly detect RCS leakage consistent with the technical basis in the approved LBB analysis for Callaway Plants.

5.0 REGULATORY ANALYSIS

5.1 NO SIGNIFICANT HAZARDS CONSIDERATION

This amendment application revises Technical Specification (TS) 3.4.15, "RCS Leakage Detection Instrumentation," to remove the containment atmosphere gaseous radioactivity monitor and make the ACTIONS consistent with NUREG-1431, Revision 3.1, "Standard Technical Specifications Westinghouse Plants.".

AmerenUE has evaluated the proposed change and determined that the change does not involve a significant hazards consideration for Callaway based on the three standards set forth in 10 CFR 50.92(c) as discussed below:

(1) **The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.**

Response: No

The proposed change has been evaluated and determined to not increase the probability or consequences of an accident previously evaluated. The proposed change does not make any hardware changes and does not alter the configuration of any plant system, structure, or component (SSC). The proposed change only removes the containment atmosphere gaseous radioactivity monitor as an option for meeting the OPERABILITY requirements for TS 3.4.15. The TS will continue to require diverse means of leakage detection equipment, thus ensuring that leakage due to cracks would continue to be identified prior to propagating to the point of a pipe break and the plant shutdown accordingly. Therefore, the consequences of an accident are not increased.

(2) **The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

Response: No

The proposed change does not involve the use or installation of new equipment and the currently installed equipment will not be operated in a new or different manner. No new or different system interactions are created and no new processes are introduced. The proposed changes will not introduce any new failure mechanisms, malfunctions, or accident initiators not already considered in the design and licensing bases. The proposed change does not affect any SSC associated with an accident initiator. Based on this evaluation, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

(3) **The proposed change does not involve a significant reduction in a margin of safety.**

The proposed change does not alter any Reactor Coolant System (RCS) leakage detection components. The proposed change only removes the containment atmosphere gaseous radioactivity monitor as an option for meeting the OPERABILITY requirements for TS 3.4.15. This change is required since the level of radioactivity in the Callaway reactor coolant has become much lower than what was assumed in the FSAR and the gaseous channel can no longer promptly detect a small RCS leak under normal conditions. The proposed amendment continues to require diverse means of leakage detection equipment with capability to promptly detect RCS leakage. Although not required by TS, additional diverse means of leakage detection capability are available as described in the FSAR Section 5.2.5. Early detection of leakage, as the potential indicator of a crack(s) in the RCS pressure boundary, will thus continue to be in place so that such a condition is known and appropriate actions taken well before any such crack would propagate to a more severe condition. Based on this evaluation, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, AmerenUE concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c).

5.2 APPLICABLE REGULATORY REQUIREMENTS/CRITERIA

10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion 30, "Quality of reactor coolant pressure boundary," requires that means be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage. The various means for detecting reactor coolant leakage at Callaway were previously discussed in Section 3.0, "Background."

As described in the FSAR, the Callaway design conforms to Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," dated May 1973. Regulatory Guide 1.45 describes acceptable methods for implementing the requirement of Criterion 30 (above) with regard to the selection of leakage detection systems for the reactor coolant pressure boundary. The specific attributes of the reactor coolant leakage detection systems are outlined in Regulatory Position 1 through 9 of Regulatory Guide 1.45. Callaway conformance with Regulatory Guide 1.45 is described in Appendix 3A and FSAR Table 5.2-6. Removal of the containment atmosphere gaseous radioactivity monitor from the TS is not in conflict with the guidance of the Regulatory Guide and will result in conformance with the NRC position provided in Reference 4.

NUREG-0800, Standard Review Plan, Draft Section 3.6.3, "Leak-Before-Break Evaluation Procedures," 52 FR 32626-32633, August 28, 1987, provides NRC staff guidance for evaluation of leakage detection systems to support leak-before-break evaluations. Leak detection systems equivalent to those recommended in Regulatory Guide 1.45 are required for piping inside containment. As stated above, the Callaway Plant design, with certain clarifications and exceptions, conforms to Regulatory Guide 1.45. The diverse RCS Leakage Detection Instrumentation continues to satisfy the Regulatory Guide 1.45 criteria.

10 CFR 50.36, "Technical Specifications," paragraph (c)(2)(ii)(A), specifies that a TS limiting condition for operation of a nuclear reactor must be established for installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. Currently, the instrumentation addressed in TS 3.4.15 satisfies this requirement. The removal of the containment atmosphere gaseous radioactivity monitor from the TS is not in conflict with this requirement.

There will be no changes such that compliance with any of the regulatory requirements and guidance documents above would come into question. The evaluations performed by AmerenUE confirm that Callaway Plant will continue to comply with all applicable regulatory requirements.

6.0 ENVIRONMENTAL CONSIDERATION

AmerenUE has determined that the proposed amendment would change requirements with respect to the 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, AmerenUE has evaluated the proposed amendment and has determined that the amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amount of effluent that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22 (b), an environmental assessment of the proposed amendment is not required.

7.0 REFERENCES

1) NRC Integrated Inspection Report 05000483/2003005, October 16, 2003.

2) Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3) ULNRC-05197, "Request for Approval of Changes to the Reactor Coolant System Leakage Detection Methodology, August 26, 2005.

4) NRC letter, "Callaway Plant, Unit 1 – License Amendment Request to Change the Reactor Coolant System Leakage Detection Instrumentation Methodology (TAC NO. MC8220)," May 16, 2006.

5) Callaway Plant Environmental Report – Operating Licensing Stage.

ATTACHMENT 2

MARKUP OF TECHNICAL SPECIFICATIONS

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

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

a. The containment sump level and flow monitoring system;

b. One containment atmosphere particulate radioactivity monitor; and

c. The containment cooler condensate monitoring system ~~or one containment atmosphere gaseous radioactivity monitor.~~

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

ACTIONS

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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required containment atmosphere particulate radioactivity monitor inoperable.	B.1.1	Analyze samples of the containment atmosphere.	Once per 24 hours
	OR		
	B.1.2	---------- NOTE ---------- Not required until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	~~B.2~~ B.2.1	Restore required containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days
INSERT A →			
D. ~~C.~~ Required containment atmosphere ~~gaseous~~ particulate radioactivity monitor inoperable.	~~C.1.1~~	~~Analyze samples of the containment atmosphere.~~	~~Once per 24 hours~~
	~~OR~~		
AND			
Required containment cooler condensate monitoring system inoperable.	~~C.1.2~~	~~NOTE~~ ~~Not required until 12 hours after establishment of steady state operation.~~	
		~~Perform SR 3.4.13.1.~~	~~Once per 24 hours~~
	~~AND~~		

(continued)

INSERT A

	OR		
	B.2.2	*Verify containment air cooler condensate monitoring system is OPERABLE.*	*30 days*
C. Required containment cooler condensate monitoring system inoperable.	*C.1*	*Perform SR 3.4.15.1.*	*Once per 8 hours*
	OR		
	C.2	*----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ----------*	
		Perform SR 3.4.13.1.	*Once per 24 hours*

ACTIONS (*continued*)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. ~~C.~~ (continued)	~~C.2.1~~ D.1 Restore required containment atmosphere particulate ~~gaseous~~ radioactivity monitor to OPERABLE status. OR ~~C.2.2~~ D.2 Restore required containment cooler condensate monitoring system to OPERABLE status.	30 days 30 days
E. ~~D.~~ Required Action and associated Completion Time not met.	~~D.1~~ E.1 Be in MODE 3. AND ~~D.2~~ E.2 Be in MODE 5.	6 hours 36 hours
F. ~~E.~~ All required monitoring methods inoperable.	~~E.1~~ F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate ~~and gaseous~~ radioactivity monitor~~s~~.	12 hours
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate ~~and gaseous~~ radioactivity monitor~~s~~.	92 days
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump level and flow monitoring system.	18 months
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate ~~and gaseous~~ radioactivity monitor~~s~~.	18 months
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment cooler condensate monitoring system.	18 months

ATTACHMENT 3

RETYPED TECHNICAL SPECIFICATIONS

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

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

a. The containment sump level and flow monitoring system;

b. One containment atmosphere particulate radioactivity monitor; and

c. The containment cooler condensate monitoring system.

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

ACTIONS

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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required containment atmosphere particulate radioactivity monitor inoperable.	B.1.1	Analyze samples of the containment atmosphere.	Once per 24 hours
	OR		
	B.1.2	---------- NOTE ---------- Not required until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	B.2.1	Restore required containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days
	OR		
	B.2.2	Verify containment air cooler condensate monitoring system is OPERABLE.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required containment cooler condensate monitoring system inoperable.	C.1	Perform SR 3.4.15.1.	Once per 8 hours
	OR		
	C.2	---------- NOTE ---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 24 hours
D. Required containment atmosphere particulate radioactivity monitor inoperable. AND Required containment cooler condensate monitoring system inoperable.	D.1	Restore required containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days
	OR		
	D.2	Restore required containment cooler condensate monitoring system to OPERABLE status.	30 days
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours
F. All required monitoring methods inoperable.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate radioactivity monitor.	12 hours
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate radioactivity monitor.	92 days
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump level and flow monitoring system.	18 months
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate radioactivity monitor.	18 months
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment cooler condensate monitoring system.	18 months

ATTACHMENT 4

MARKUP OF TECHNICAL SPECIFICATIONS BASES
(Information Only)

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

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

Leakage detection systems must have the capability to detect significant reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE.

Industry practice has shown that water flow changes of 0.5 to 1.0 gpm can be readily detected in contained volumes by monitoring changes in water level, in flow rate, or in the operating frequency of a pump. The containment sump level and flow monitoring system, used to collect unidentified LEAKAGE, and containment cooler condensate monitoring system are instrumented to alarm for increases of 0.5 to 1.0 gpm in the normal flow rates. This sensitivity is acceptable for detecting increases in unidentified LEAKAGE.

The reactor coolant contains radioactivity that, when released to the containment, can be detected by radiation monitoring instrumentation. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. Instrument ~~sensitivities~~ of 10^{-9} µCi/cc radioactivity for particulate monitoring ~~and of 10^{-6} µCi/cc radioactivity for gaseous monitoring are~~ practical for ~~these~~ leakage detection systems. ~~This~~ Radioactivity detection system~~s are~~ included for monitoring ~~both~~ particulate ~~and gaseous~~ activities because of ~~their sensitivities~~ and rapid responses to RCS LEAKAGE.

sensitivity *is* *This* *this* *is* *its sensitivity*

INSERT 1

An increase in humidity of the containment atmosphere would indicate release of water vapor to the containment. Dew point temperature measurements can thus be used to monitor humidity levels of the containment atmosphere as an indicator of potential RCS LEAKAGE. A 1°F increase in dew point is well within the sensitivity range of available instruments.

(continued)

INSERT 1

The measurement of containment atmosphere gaseous radioactivity is less sensitive than the measurement of particulate radioactivity for the purpose of detecting RCS leakage. Evaluations have shown that the pre-existing containment radioactive gaseous background levels for which reliable detection is possible is dependent upon the reactor power level, percent failed fuel in the reactor, and air volume exchange brought about by the containment purge system. With primary coolant concentrations less than equilibrium levels, such as during reactor startup and operation with no fuel defects, the increase in detector count rate due to leakage will be partially masked by the statistical variation of the minimum detector background count rate, rendering reliable detection of a 1 gpm leak uncertain. The containment gaseous radioactivity monitor is considered most useful for detecting an RCS-to-containment atmosphere leak if elevated reactor coolant gaseous activity is present. The containment gaseous radioactivity monitors are not required by this LCO. (Reference 7)

BASES

BACKGROUND (continued)

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

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

APPLICABLE SAFETY ANALYSES

The asymmetric loads produced by postulated breaks are the result of assumed pressure imbalance, both internal and external to the RCS. The internal asymmetric loads result from a rapid decompression that causes large transient pressure differentials across the core barrel and fuel assemblies. The external asymmetric loads result from the rapid depressurization of the annulus regions, such as the annulus between the reactor vessel and the shield wall, and cause large transient pressure differentials to act on the vessel. These differential pressure loads could damage RCS supports, core cooling equipment or core internals. This concern was first identified as Multiplant Action (MPA) D-10 and subsequently as Unresolved Safety Issue (USI) 2, "Asymmetric LOCA Loads" (Ref. 4).

The resolution of USI-2 for Westinghouse PWRs was the use of fracture mechanics technology for RCS piping > 10 inches diameter (Ref. 5). This technology became known as leak-before-break (LBB). Included within the LBB methodology was the requirement to have leak detection systems capable of detecting a 1.0 gpm leak within four hours. This leakage rate is designed to ensure that adequate margins exist to detect leaks in a timely manner during normal operation conditions.

Actual leakage detection capabilities are discussed in Reference 3.

The need to evaluate the severity of an alarm or an indication is important to the operators, and the ability to compare and verify with indications from other systems is necessary. The system response times and sensitivities are described in the FSAR (Ref. 3). Multiple instrument locations are utilized, if needed, to ensure that the transport delay time of

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

the leakage from its source to an instrument location yields an acceptable overall response time.

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

RCS leakage detection instrumentation satisfies Criterion 1 of 10CFR50.36(c)(2)(ii).

LCO

One method of protecting against large RCS leakage derives from the ability of instruments to rapidly detect extremely small leaks. This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide a high degree of confidence that extremely small leaks are detected in time to allow actions to place the plant in a safe condition, when RCS LEAKAGE indicates possible RCPB degradation.

This LCO is satisfied when diverse monitoring methods are available. Thus, the containment sump level and flow monitoring system, one containment atmosphere particulate radioactivity monitor, and ~~either~~ the containment cooler condensate monitoring system ~~or one containment atmosphere gaseous radioactivity monitor~~ provide an acceptable minimum. *INSERT 2*

APPLICABILITY

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

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

(continued)

INSERT 2

For the containment atmosphere particulate radioactive monitor, particulate channels of either GTRE0031 or GTRE0032 satisfy the LCO requirement.

The sump level and flow monitoring system, the containment air particulate monitoring system, and the containment cooler condensate measuring system are capable of detecting a one gpm leak in one hour at the sensitivity recommended in Regulatory Guide 1.45.

BASES (Continued)

ACTIONS

A.1 and A.2

A primary system leak would result in reactor coolant flowing into the containment normal sumps or into the instrument tunnel sump. Indication of increasing sump level is transmitted to the control room by means of individual sump level transmitters. This information is used to provide the measurement of low leakage by monitoring level increase versus time.

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

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

B.1.1, B.1.2, ~~and B.2~~ *B.2.1, and B.2.2*

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

(continued)

BASES

ACTIONS

B.2.1, and B.2.2

B.1.1, B.1.2, ~~and B.2~~ (continued)

With a sample obtained and analyzed or water inventory balance performed every 24 hours, the reactor may be operated for up to 30 days to allow restoration of the required containment atmosphere particulate radioactivity monitor. *INSERT 3*

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

INSERT 4

~~C.1.1, C.1.2, C.2.1, and C.2.2~~ *D.1 and D.2*

With the required containment atmosphere ~~gaseous~~ *particulate* radioactivity monitor *only* and the required containment cooler condensate monitoring system *is* inoperable, the means of detecting leakage ~~are~~ the containment sump level and flow monitoring system ~~and the containment atmosphere particulate radioactivity monitor.~~ This Condition does not provide all the required diverse means of leakage detection. ~~With the containment atmosphere gaseous radioactivity monitoring and containment cooler condensate monitoring system instrumentation channels inoperable, alternative action is required. Either samples of the containment atmosphere must be taken and analyzed or water inventory balances, in accordance with SR 3.4.13.1, must be performed every 24 hours to provide alternate periodic information. Samples of the containment atmosphere are obtained and analyzed for gaseous and particulate radioactivity. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.~~ The ~~followup~~ Required Action is to restore either of the inoperable required monitoring methods to OPERABLE status within 30 days to regain the intended leakage detection diversity. The 30 day Completion Time ensures that the plant will not be operated in a reduced configuration for a lengthy time period.

(continued)

INSERT 3

Alternatively, continued operation is allowed if the containment air cooler condensate monitoring system is OPERABLE, provided grab samples are taken or water inventory balances are performed every 24 hours.

INSERT 4

C.1 and C.2

With the required containment cooler condensate monitoring system inoperable, alternative action is again required. Either SR 3.4.15.1 must be performed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information. Provided a CHANNEL CHECK is performed every 8 hours or a water inventory balance is performed every 24 hours, reactor operation may continue while awaiting restoration of the containment cooler condensate monitoring system to OPERABLE status.

The 24 hour interval provides periodic information that is adequate to detect RCS LEAKAGE. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (near operating rated operating pressure with stable RCS pressure, temperature, power level, pressurizer and makeup tank level, makeup and letdown, and RCP seal injection and return flows.) The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

BASES

ACTIONS (continued)

~~D.1 and D.2~~ *E.1 and E.2*

If a Required Action of Condition A, B, ~~or C~~ *C, or D* cannot be met, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

~~E.1~~ *F.1*

With all required monitoring methods inoperable, no automatic means of monitoring leakage are available, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere particulate ~~and gaseous~~ radioactivity monitors (GTRE0031 ~~and~~ *or* GTRE0032). The check gives reasonable confidence that the channels are operating properly. The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions. The RM-23 unit display must be used to perform the CHANNEL CHECK.

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere particulate ~~and gaseous~~ radioactivity monitors (GTRE0031 ~~and~~ *or* GTRE0032). The test ensures that the monitors can perform ~~their~~ function in the desired manner. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation. During performance of the COT, verification of the RM-23 unit display and alarm functions is required.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Frequency of 18 months is a typical refueling cycle and considers channel reliability. Again, operating experience has proven that this Frequency is acceptable. During performance of the CHANNEL CALIBRATION for the required containment atmosphere particulate ~~and gaseous~~ radioactivity monitors (GTRE0031 ~~and~~ GTRE0032), verification of the RM-23 unit display and alarm functions is required.

or

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.
2. Regulatory Guide 1.45.
3. FSAR Section 5.2.5.
4. NUREG-609, "Asymmetric Blowdown Loads on PWR Primary Systems," 1981.
5. Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops. "
6. *FSAR Table 11.5-3*
7. *NRC Letter, "Callaway Plant, Unit 1 - License Amendment Request to Change the Reactor Collant System Leakage Detection Instrumentation Methodology (TAC NO. MC8220), May 16, 2006.*

LIST OF COMMITMENTS

The following table identifies those actions committed to by AmerenUE in this document. Any other statements in this document are provided for information purposes and are not considered commitments. Please direct questions regarding these commitments to Mr. David E. Shafer at (314) 554-3104.

COMMITMENT	Due Date/Event
The license amendment will be implemented within 90 days of issuance. Final TS Bases changes will be implemented pursuant to TS 5.5.14 at the time the amendment is implemented.	Within 90 days of NRC issuance