AmerenUE
Callaway Plant

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August 7, 2006

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

ULNRC-05321

Ladies and Gentlemen:

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

Ref: 1. ULNRC-05307, dated June 29, 2006.
2. ULNRC-05314, dated July 19, 2006.

Per Reference 2, Union Electric Company (AmerenUE) submitted to the NRC an application for an exigent amendment of the Callaway Facility Operating License No. NPF-30. This exigent amendment would, in addition to removing the containment atmosphere gaseous radioactivity monitor, as requested in Reference 1 above, remove the containment cooler condensate monitoring from Technical Specification (TS) 3.4.15, and superseded the application request submitted by Reference 2.

Upon further review of the Callaway Plant licensing and design basis and the Regulatory Guide 1.45 clarification provided by NRC in the telephone conversation conducted on August 2, 2006, that the 1 gpm in an hour requirement is only applied to the instrument, it was determined that the containment cooler condensate monitoring system is capable of performing its intended design and licensing bases functions. AmerenUE determined that the system was operable and exited TS 3.4.15 Condition C on August 3, 2006.

AmerenUE hereby withdraws the application for amendment submitted by Reference 2 and request the NRC continue to process the application for amendment to Facility Operating License No. NPF-30 for the Callaway Plant submitted by Reference 1.

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In addition, Attachment 1 provides revised Proposed TS Bases markups which supersede those provided in Reference 1, Attachment 4. The revised TS Bases markups incorporate additional information identified during the review of the licensing and design basis for RCS leakage detection instrumentation. The TS Bases markups are 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 does not contain new commitments.

If you have any questions on this request, please contact Mr. David Shafer at (314) 554-3104.

Sincerely,

Keith D. Young
Manager - Regulatory Affairs

Attachments: 1 – Revised Proposed Technical Specification Bases Changes (for information only)

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ULNRC-05321

ATTACHMENT 1

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.

INSERT 1A

instrument

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 ~~systems 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 1A

For the containment sump level and flow monitoring system, and the containment cooler condensate monitoring system, a leakage rate change of 1 gpm is detectable in 1 hour after leakage has reached the system.

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 $\leq$ 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 after the leakage has reached the system 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.1.1, B.1.2, ~~and B.2~~ *B.2.1, and B.2.2* (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 *or* ~~and~~ 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 *or* ~~and~~ 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.