

Donald F. Schnell
Senior Vice President
Nuclear

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

Gentlemen:

ULNRC-3070

DOCKET NUMBER 50-483
CALLAWAY PLANT
REFUELING POOL WALL DECONTAMINATION
UNREVIEWED SAFETY QUESTION

Reference: NRC Region III Inspection Report
50-483/94007 dated July 29, 1994

Union Electric Company herewith transmits an application for amendment to Facility Operating License No. NPF-30 for the Callaway Plant.

This amendment application reflects an unreviewed safety question associated with the use of reactor makeup water to rinse items removed from the refueling pool and to spray down the refueling pool walls during the pool drain evolution to facilitate decontamination activities. The use of reactor makeup water in prior refueling outages during these Mode 6 activities raises the possibility of a different type of accident than any previously evaluated in the Callaway FSAR. FSAR Section 15.4.6.2 currently states that administrative controls during Mode 6, i.e. closing and locking dilution source manual valves, preclude an inadvertent dilution of the boron concentration of the primary system. Since these valve closures do not preclude the potential dilution scenario described above and different procedural controls are required for the above evolution to ensure that the 2000 ppm limit of LCO 3.9.1 is met, an unreviewed safety question exists. Pursuant to 10CFR50.59(c)(2), this amendment application is required since changes are needed to procedural controls as described in the FSAR and these changes involve an unreviewed safety question. Commission approval is required prior to implementation.

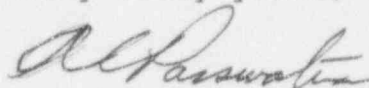
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Attachments 1 through 5 provide the Safety Evaluation, Significant Hazards Evaluation, Environmental Consideration, proposed Technical Specification Bases revisions, and proposed FSAR changes, respectively, in support of this amendment request. It has been determined that, although this amendment application is required since it involves an unreviewed safety question, there is no significant hazards consideration as determined per 10CFR50.92. Pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

Review and approval of this amendment application is requested by March 1, 1995 to support the Refuel 7 outage schedule. If you have any questions on the attachments, please contact us.

Very truly yours,



 Donald F. Schnell

GGY/plr

- Attachments:
- 1) Safety Evaluation
 - 2) Significant Hazards Evaluation
 - 3) Environmental Consideration
 - 4) Proposed Technical Specification Bases Revisions
 - 5) Proposed FSAR Changes

STATE OF MISSOURI)
)
CITY OF ST. LOUIS) S S

Alan C. Passwater, of lawful age, being first duly sworn upon oath says that he is Manager, Licensing and Fuels (Nuclear) for Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Alan C. Passwater
Alan C. Passwater
Manager, Licensing and Fuels
Nuclear

SUBSCRIBED and sworn to before me this 8th day
of September, 1994.

G. L. Waters

G. L. WATERS
NOTARY PUBLIC, STATE OF MISSOURI
MY COMMISSION EXPIRES 3/16/95
ST. LOUIS COUNTY

cc: T. A. Baxter, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N. Street, N.W.
Washington, D.C. 20037

M. H. Fletcher
Professional Nuclear Consulting, Inc.
18225-A Flower Hill Way
Gaithersburg, MD 20879-5334

L. Robert Greger
Chief, Reactor Project Branch 1
U.S. Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Bruce Bartlett
Callaway Resident Office
U.S. Regulatory Commission
RR#1
Steedman, MO 65077

L. R. Wharton (2)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
1 White Flint, North, Mail Stop 13E21
11555 Rockville Pike
Rockville, MD 20852

Manager, Electric Department
Missouri Public Service Commission
P.O. Box 360
Jefferson City, MO 65102

Ron Kucera
Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

bcc: D. Shafer/A160.761
/QA Record (CA-758)

Nuclear Date

E210.01

DFS/Chrono

D. F. Schnell

J. E. Birk

J. V. Laux

R. D. Affolter

G. L. Randolph

R. J. Irwin

P. M. Barrett

C. D. Naslund

J. D. Blosser

A. C. Passwater

D. E. Shafer

W. E. Kahl

S. Wideman (WCNOC)

M. D. Archdeacon (Bechtel)

T. P. Sharkey

NSRB (Sandra Dale)

A140.0001.002 (1159)

G.G. Yater

ATTACHMENT ONE

SAFETY EVALUATION

SAFETY EVALUATION

INTRODUCTION

This amendment application reflects an unreviewed safety question associated with the use of reactor makeup water (RMW) to rinse items removed from the refueling pool and to spray down the refueling pool walls during the pool drain evolution to facilitate decontamination activities. The use of reactor makeup water in prior refueling outages during these Mode 6 activities raises the possibility of a different type of accident than any previously evaluated in the Callaway FSAR. FSAR Section 15.4.6.2 currently states that administrative controls during Mode 6, i.e. closing and locking dilution source manual valves, preclude an inadvertent dilution of the boron concentration of the primary system. Since these valve closures do not preclude the potential dilution scenario described above and different procedural controls are required for the above evolution to ensure that the 2000 ppm limit of LCO 3.9.1 is met, an unreviewed safety question exists. Pursuant to 10CFR50.59(c)(2), this amendment application is required since changes are needed to procedural controls as described in the FSAR and these changes involve an unreviewed safety question. Commission approval is required prior to implementation.

BACKGROUND

During Refuel 1 in March 1986, an inadvertent dilution of the refueling pool occurred at Callaway while in Mode 6 during decontamination of the pool walls. This activity was performed using unborated reactor makeup water while simultaneously draining the refueling pool via the RHR flow path to the RWST. Corrective actions for this incident included the establishment of administrative controls to limit the amount of unborated water added to the refueling pool during the rinsing of items removed from the pool. Refueling pool wall washdowns while simultaneously draining the pool were precluded during Refuels 2-5.

During Refuel 5 in April 1992, a strippable decontamination coating was sprayed on the refueling pool walls and floor. As a result of the walls and floor being dry, in conjunction with loose surface contamination, airborne radioactivity levels increased and resulted in several personnel contaminations and a work stoppage. Corrective actions for this event included the revision of the previous directives and allowed rinsing of the refueling pool walls during the draining evolution in order to facilitate the removal of the strippable coating and avoid creating an airborne radioactivity condition. A conservative calculation was

performed to ensure that the amount of unborated water added would not lower the refueling pool boron concentration below 2000 ppm (this Technical Specification 3.9.1 LCO has been more limiting for Callaway's reloads than the LCO directing that k_{eff} be 0.95 or less). Conservatism was ensured by assuming that the rinse water was added to the RCS volume at mid-loop, neglecting the rest of the volume of the refueling pool.

This procedure was used during Refuel 6 (November 1993) and unborated water was used to decontaminate items removed from the refueling pool and to rinse the refueling pool walls while simultaneously draining the pool via the RHR connection to the RWST. This unborated reactor makeup water was added via a 3/4 inch hose connected to manual valve BL-V-0079 and equipped with a flow totalizer.

Quality Assurance personnel raised concerns with this practice and the associated 10CFR50.59 evaluations. It was determined that an unreviewed safety question was involved by virtue of the creation of a dilution path different than any discussed in FSAR Section 15.4.6.2.

UNREVIEWED SAFETY QUESTION EVALUATION

Operation of Callaway Plant in accordance with these changes would:

- (1) Not involve an increase in the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR.

The initiating events are presented in revised FSAR Section 15.4.6.2. The proposed changes affect only the procedural controls applicable for Mode 6.

Overall protection system performance will remain within the bounds of the accident analyses documented in FSAR Chapter 15, WCAP-10961-P, and WCAP-11883 since no hardware changes are proposed.

There will be no degradation in the performance of nor an increase in the number of challenges to equipment assumed to function during an accident situation.

This amendment application does not involve any hardware changes. There will be no change to normal plant operating parameters or accident mitigation capabilities.

Therefore, there will be no increase in the probability of any accident or safety-related equipment malfunction occurring due to these changes.

The Technical Specification limits on Mode 6 boron concentration will be met. The conclusions of NRC Generic Letter 85-05 and NSAC-183 will remain valid (i.e., that gradual boron dilution events are self-limiting due to inherent reactivity feedback mechanisms). Given the above, there will be no increase in the consequences of any accident or equipment malfunction.

- (2) Create the possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR.

The proposed changes do not involve any design changes nor are there any changes in the method by which any safety-related plant system performs its safety function.

However, the administrative controls described in the FSAR, SER, and the Technical Specifications for isolating the RCS from potential sources of unborated water do not address the possibility for a boron dilution event directly from the RMW system. The locking closed of the required valves in Technical Specification 3/4.9.1 would not preclude the possibility of uncontrolled boron dilution of the filled portions of the RCS. This practice would place the plant in a condition that has not been analyzed by the NRC nor by Union Electric in accordance with the Standard Review Plan (NUREG-0800). Also, it is not bounded by a current FSAR safety analysis.

While the FSAR establishes administrative controls that isolate the RCS from the potential source of unborated water by locking closed valves, this amendment application would establish administrative controls that create a new source of unborated water but control the amount of water that is added. Consequently, administrative controls that control the amount of unborated water added to the RCS are less restrictive and not equivalent to administrative controls that isolate the RCS from all potential sources of unborated water. The significance of this issue is addressed below.

- (3) Not involve a reduction in the margin of safety as defined in the basis for any Technical Specification.

The proposed administrative controls are sufficient to preclude diluting the boron concentration of the refueling pool below 2000 ppm.

There will be no effect on the manner in which safety limits or limiting safety system settings are determined nor will there be any effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on DNBR limits, F_Q , F -delta-H, LOCA PCT, peak local power density, or any other margin of safety.

Therefore, the proposed amendment involves an unreviewed safety question and requires NRC approval prior to implementation.

JUSTIFICATION FOR APPROVAL OF PROPOSED AMENDMENT

Dilution accidents, as a class of transients, have been previously evaluated in FSAR Section 15.4.6. The basis for this amendment application involving an unreviewed safety question is the narrow context in which FSAR Section 15.4.6.2 was originally written. This section of the FSAR could just as easily have been written to specify that administrative controls will be established to prevent diluting the pool below acceptable boron concentration limits. Attachment 5 contains proposed FSAR changes to this end. After issuance of these FSAR changes, the Mode 6 event will have been "evaluated."

Further, this event has been evaluated in NSAC-183, "Risk of PWR Inadvertent Criticality During Shutdown and Refueling," dated December 1992. An event is discussed in NSAC-183 wherein demineralized water was used to spray down the cavity walls as level was being reduced. RCS boron concentration was reduced in that event from 2663 ppm to 2626 ppm during a time when source range detectors were inoperable. A concern was postulated regarding the passage through the core of a diluted layer at the top of the refueling pool as a result of the draining evolution. It was concluded in NSAC-183 that this event would not be capable of causing core damage. In addition, Callaway Technical Specification 3.9.2 requires that two source range channels be operable while in Mode 6 with action to terminate positive reactivity additions if one channel is inoperable.

The balance of this portion of the evaluation is to assess the significance of the requested changes. Procedural controls will be implemented to assure that the refueling pool boron concentration always satisfies Technical Specification 3.9.1. The amount of unborated reactor makeup water that could be added to the refueling pool prior to the pool's boron concentration being reduced to below 2000 ppm will be calculated for each refueling based on the initial pool boron concentration and the RCS volume at mid-loop (no credit given to the rest of the refueling pool volume). That calculated volume will then be further reduced by one

half for extra conservatism (a volume equivalent to approximately three inches in the refueling pool when the level is above the reactor cavity seal/shield ring). The procedure for draining the refueling pool will also be revised, to address the postulated diluted layer issue of NSAC-183, as follows:

1. The water level will be drained to approximately one foot above the reactor cavity seal/shield ring. The refueling pool will then be drained via the reactor coolant drain tank (RCDT) pumps or other available means (excluding the RHR system) until the level is below the cavity seal/shield ring. This will direct the potentially diluted layer of water at the top of the pool away from the reactor vessel and core.
2. After the level has been lowered to below the cavity seal/shield ring, further draining of the area enclosed by the inside diameter of the ring will be performed via the RHR connection to CVCS letdown.

These administrative controls will minimize the amount of unborated water which could enter the reactor vessel from washdown procedures.

CONCLUSION

Based on the information presented above, the proposed amendment will not adversely affect or endanger the health or safety of the general public.

ATTACHMENT TWO

SIGNIFICANT HAZARDS EVALUATION

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This amendment application reflects an unreviewed safety question associated with the use of reactor makeup water to rinse items removed from the refueling pool and to spray down the refueling pool walls during the pool drain evolution to facilitate decontamination activities. The use of reactor makeup water in prior refueling outages during these Mode 6 activities raises the possibility of a different type of accident than any previously evaluated in the Callaway FSAR. FSAR Section 15.4.6.2 currently states that administrative controls during Mode 6, i.e. closing and locking dilution source manual valves, preclude an inadvertent dilution of the boron concentration of the primary system. Since these valve closures do not preclude the potential dilution scenario described above and different procedural controls are required for the above evolution to ensure that the 2000 ppm limit of LCO 3.9.1 is met, an unreviewed safety question exists. Pursuant to 10CFR50.59(c)(2), this amendment application is required since changes are needed to procedural controls as described in the FSAR and these changes involve an unreviewed safety question. Commission approval is required prior to implementation.

The proposed changes do not involve a significant hazards consideration because operation of Callaway Plant in accordance with these changes would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

The initiating events are presented in revised FSAR Section 15.4.6.2. The proposed changes affect only the procedural controls applicable for Mode 6.

Overall protection system performance will remain within the bounds of the accident analyses documented in FSAR Chapter 15, WCAP-10961-P, and WCAP-11883 since no hardware changes are proposed.

There will be no degradation in the performance of nor an increase in the number of challenges to equipment assumed to function during an accident situation.

This amendment application does not involve any hardware changes. There will be no change to normal plant operating parameters or accident mitigation capabilities. Therefore, there will be no increase in the probability of any accident previously evaluated.

The Technical Specification limits on Mode 6 boron concentration will be met. The conclusions of NRC Generic Letter 85-05 and NSAC-183 will remain valid (i.e., that gradual boron dilution events are self-limiting due to inherent reactivity feedback mechanisms). Given the above, there will be no increase in the consequences of any accident previously evaluated.

- (2) Create the possibility of a new or different kind of accident from any previously evaluated.

As discussed above, there are no hardware changes associated with these Technical Specification revisions nor are there any changes in the method by which any safety-related plant system performs its safety function.

Administrative controls will limit the volume of unborated water which can be added to the refueling pool for decontamination activities. Administrative controls will also limit the potential for an unborated layer of water from entering the core region during the draining evolution. Technical Specification 3.9.1 will continue to be met.

Given the above and the safety evaluation continued in Attachment 1, the possibility of a new or different kind of accident from any previously evaluated is not created.

- (3) Involve a significant reduction in a margin of safety.

The proposed administrative controls are sufficient to preclude diluting the boron concentration of the refueling pool below 2000 ppm. There will be no effect on the manner in which safety limits or limiting safety system settings are determined nor will there be any effect on those plant systems necessary to assure the accomplishment of protection function. There will be no impact on DNBR limits, F_Q , $F_{\Delta H}$, LOCA PCT, peak local power density, or any other margin of safety.

Based upon the preceding information, it has been determined that the proposed changes to the Technical Specifications do not involve a significant increase in the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed changes meet the requirements of 10CFR50.92(c) and do not involve a significant hazards consideration.

ATTACHMENT THREE

ENVIRONMENTAL CONSIDERATION

ENVIRONMENTAL CONSIDERATION

This amendment application reflects an unreviewed safety question associated with the use of reactor makeup water to rinse items removed from the refueling pool and to spray down the refueling pool walls during the pool drain evolution to facilitate decontamination activities. The use of reactor makeup water in prior refueling outages during these Mode 6 activities raises the possibility of a different type of accident than any previously evaluated in the Callaway FSAR. FSAR Section 15.4.6.2 currently states that administrative controls during Mode 6, i.e. closing and locking dilution source manual valves, preclude an inadvertent dilution of the boron concentration of the primary system. Since these valve closures do not preclude the potential dilution scenario described above and different procedural controls are required for the above evolution to ensure that the 2000 ppm limit of LCO 3.9.1 is met, an unreviewed safety question exists. Pursuant to 10CFR50.59(c)(2), this amendment application is required since changes are needed to procedural controls as described in the FSAR and these changes involve an unreviewed safety question. Commission approval is required prior to implementation.

The proposed amendment involves changes with respect to the use of facility components located within the restricted area, as defined in 10CFR20. Union Electric has determined that the proposed amendment does not involve:

- 1) A significant hazards consideration, as discussed in Attachment 2 of this amendment application;
- 2) A significant change in the types or significant increase in the amounts of any effluents that may be released offsite;
- 3) A significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10CFR51.22(c)(9). Pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.