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June 7, 1995

1CAN069506

U. S. Nuclear Regulatory Commission
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Washington, DC 20555

Subject: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Supplement To Technical Specification Change Request Concerning Service Water Flow Rate To The Reactor Building Emergency Cooling System

Gentlemen:

By letters dated May 15, 1995 (1CAN059505) and May 19, 1995 (1CAN059507) Entergy Operations proposed changes to the Arkansas Nuclear One - Unit 1 (ANO-1) Technical Specifications (TSs) for verifying adequate service water flow to each train of reactor building emergency cooling. Each of these letters proposed permanent changes to the specified minimum flow rate of 1200 gpm. Subsequent discussions with the NRC staff on June 6, 1995 have indicated that an exception to the surveillance requirements for the period of time necessary to repair the reactor building cooling fan motor would be more appropriate. Based upon these discussions, a footnote has been added to Surveillance Requirement 4.5.2.1.2(a)(1) to indicate that the surveillance would not be required until the green train of the reactor building emergency cooling is returned to normal configuration or July 14, 1995, whichever is earlier. The conclusions of the no significant hazards consideration determination from the May 15, 1995 submittal remain valid for this proposed TS change.

Entergy Operations requests that the effective date for this change be immediately upon NRC issuance of the amendment. We request that this proposed change be considered under exigent circumstances as described in 10CFR50.91(a)(6) in that failure to act quickly could result in the shutdown of ANO-1.

A001
1/1

Very truly yours,

J W Yelverton

JWY/gra
Attachments

To the best of my knowledge and belief, the statements contained in this submittal are true.

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for Johnson **County and the State of Arkansas, this** 7 **day of** June **, 1995.**

Juana M. Tapp

Notary Public
My Commission Expires 11-8-2000

OFFICIAL SEAL
JUANA M. TAPP
NOTARY PUBLIC - ARKANSAS
JOHNSON COUNTY
My Commission Expires: 11 - 8 - 2000

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ATTACHMENT

TO

1CAN069506

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. DPR-51

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT ONE

DOCKET NO. 50-313

DESCRIPTION OF PROPOSED CHANGES

Arkansas Nuclear One - Unit 1 (ANO-1) Surveillance Requirement 4.5.2.1.2(a)(1) has been modified to include a footnote that would allow an exception to the performance of this surveillance on the green train of the reactor building emergency cooling system until the green train of the reactor building emergency cooling system is returned to normal configuration or July 14, 1995, whichever is earlier. This change will allow sufficient time to repair the VSF-1D fan motor while maintaining the green train of the current reactor building emergency cooling system configuration operable, consistent with the Notice of Enforcement Discretion issued on May 17, 1995.

BACKGROUND

The reactor building emergency cooling system consists of two redundant trains, each containing two cooling units. Each unit contains normal and emergency cooling coils and a single speed fan. During normal plant operation, chilled water is circulated through the normal cooling coils in each of the four units. During emergency operation, a bypass damper redirects airflow from the normal cooling coils to the emergency cooling coils. In this configuration, cooling is provided by service water to the emergency cooling coils.

The safety function of the reactor building emergency cooling system is to operate in conjunction with the reactor building spray system to maintain reactor building temperature and pressure below design limits following a design basis accident. In addition to limiting the peak reactor building temperature and pressure, the reactor building pressure must be reduced by 50% of the peak pressure within 24 hours following the initiation of the design basis accident. Further description of the reactor building emergency cooling system is provided in the ANO-1 Safety Analysis Report Section 6.3.

The original ANO-1 Technical Specifications contained no specific requirements for periodic flow testing of the reactor building coolers. On September 3, 1980 ANO-2 was shut down after a failure to meet the ANO-2 Technical Specification surveillance requirements for minimum service water flow rate through its containment cooling units. The inadequate flow was due to extensive plugging of the containment cooling units by Asiatic clams (corbicula species). Subsequent examinations of the ANO-1 service water system revealed that the "C" and "D" containment coolers were also clogged by Asiatic clams. As a result of this event ANO management committed, in a meeting with the NRC on October 22, 1980, to modify the ANO-1 Technical Specification, during the next refueling outage, to incorporate similar surveillance and chlorination procedures as contained in the ANO-2 Technical Specifications.

Proposed technical specification changes were submitted to the NRC for their review on January 30, 1981. This proposed change specified that at least once per 14 days, each reactor building cooling group shall be tested to demonstrate proper operation of the system. The proposed test was to be performed in accordance with the procedure summarized below:

1) Verifying a service water flow rate of ≥ 1200 gpm to each group of cooling units.

2) Chlorinating the service water during this surveillance, whenever service water temperature is between 60°F and 80°F.

Additionally, a limiting condition for operation 3.3.7 (F) was added which required when any cooling unit of the required groups is inoperable because the associated fan is inoperable, verify that the operable cooling unit in that group has a service water flow rate of ≥ 1200 gpm through the cooling coils or restore the inoperable cooling unit to operable status within 7 days or be in at least hot shutdown within the next 6 hours and in cold shutdown within the following 30 hours.

The proposed Technical Specification Bases changes associated with the above described submittal provides no insights with respect to the selection of the ≥ 1200 gpm value.

The NRC incorporated these proposed changes to the ANO-1 Technical Specifications as Amendment 62. The associated safety evaluation report (SER) for Amendment 62 reiterated the background information discussed above. In the evaluation portion of the SER it noted that "the augmented surveillance of flow with chlorination will assure mortality of non-valved larvae in the service water system and the detection of valved larvae or other flow clogging mechanisms before rendering the reactor building cooling units inoperable."

The reactor building cooler technical specifications were next modified by amendment 145 issued April 10, 1991. This change was proposed to provide clarification in light of events which required blanking off a number of coils in the Loop 2 ("C" and "D") reactor building coolers. Analysis performed by ANO at that time showed that with both fans and a complete set of coils split between the two coolers, the design heat removal requirements of a single train were exceeded.

The proposed changes submitted to the NRC in letter 1CAN019101, dated January 29, 1991, which were incorporated as amendment 145, defined the requirements for reactor building emergency cooling function in terms of heat removal capacity to meet the requirements of the Safety Analysis Report rather than specific component operation. This change also replaced the nomenclature of "reactor building cooling fan and its associated cooling units" with "train of reactor building emergency cooling", the term "unit" or "group" with "train" and "reactor building cooling" was changed to "reactor building emergency cooling".

Most relevant, among the changes was the deletion of Section 3.3.7 (F) containing a service water flow rate of ≥ 1200 gpm and the addition of the following to the bases of section 3.3:

> A train consists of two coolers and their associated fans which have sufficient capacity to meet post accident heat removal requirements. Conservatively each reactor building emergency cooling train consists of two fans powered from the same emergency bus and their associated coils, but other combinations may be justified by an engineering evaluation.

Other than the terminology changes the surveillance requirements for the reactor building coolers remained unchanged.

The proposed changes were incorporated as submitted. The accompanying SER endorsed the proposed concept of determining operability of the coolers based upon engineering evaluations. With respect to the deletion of Specification 3.3.7(F) the SER noted "with the proposed upgrading of the affected Technical Specifications in terms of an operable train, this Technical Specification is redundant to Technical Specification 3.3.7 (C) and is, therefore, unnecessary."

Since amendment 145 the reactor building cooler technical specifications have remained unchanged.

DISCUSSION OF CHANGE

On May 7, 1995 one of the reactor building emergency cooling fans associated with the green train of the reactor building emergency cooling system tripped. After an unsuccessful attempt to restart the fan, a reactor building entry was made which determined that the fan motor was inoperable and would require extensive repairs or replacement.

With the cooling fan inoperable, the associated cooling unit cannot be credited for cooling purposes and must be considered inoperable. With one cooling unit providing no heat removal capability, the remaining cooling unit has insufficient service water flow to consider the train to be operable. In an effort to maximize the heat removal capability of the train and possibly restore it to an operable condition, the cooling coils associated with the inoperable fan were blind flanged so that the total green train reactor building cooler service water flow passes through the coils of the operable cooling unit. The resultant flow rate is less than the total green train reactor building cooler service water flow because with one cooler blind flanged the resistance in that portion of the system is greater. Testing was conducted which verified that flow in the current configuration was in excess of 1750 gpm through the operable cooling unit. However, when this flow is corrected to post-accident service water conditions, less than 1200 gpm would be supplied to the cooler. As discussed above, it is unclear whether the 1200 gpm acceptance criteria in SR 4.5.2.1.2(a)(1) was intended to be verified under post-accident service water conditions. However, it seems clear from the bases of Specification 3.3 that an engineering evaluation could be used to demonstrate that adequate heat removal capability exists with less than the full complement of cooling units.

An engineering evaluation of the temporary configuration of the reactor building coolers was performed. The evaluation concluded that even with less than 1200 gpm, the green reactor building cooling train was still capable of removing the required amount of post-accident heat load. Therefore, the minimum flow rate of 1200 gpm specified in the SR is inconsistent with the definition of operability in TS in that the system is still capable of meeting its safety function even though it may not meet the acceptance criteria in the SR. Also, there is no indication in the history of the SR that 1200 gpm was intended to preserve additional margin in the safety analysis.

The engineering analysis also highlighted that the minimum flow rate necessary to ensure adequate post-accident heat removal capability is affected by the current conditions in the reactor building coolers and in the service water system, e.g. service water system supply and discharge pressure, fouling on either the service water side or the airflow side of the cooling coils, anticipated service water temperature, and the number of cooling coils and fans that are in service. Each of these conditions has the potential to change during normal operation of the plant.

The proposed change to SR 4.5.2.1.2(a)(1) would allow an exception until the green train of the reactor building emergency cooling system is returned to normal configuration or July 14, 1995, whichever is earlier. This will allow sufficient time to repair the VSF-1D fan motor while maintaining the green train of reactor building emergency cooling operable, consistent with the Notice of Enforcement Discretion issued on May 17, 1995. The surveillance requirement contained in Specification 4.5.2.1.2(a)(1) will continue to be performed on the red train of the reactor building cooling system consisting of the "A" and "B" coolers. Performance of this surveillance test will detect the potential for degradation due to the presence of valved larvae or other flow clogging mechanisms well before the reactor building cooling units could be rendered inoperable and will also indicate the potential for degradation in the green train.

As a compensatory measure, the green train of the reactor building cooling system, consisting of the "C" cooler, will be tested bi-weekly to detect the potential for any degradation of service water flow that would result in reducing the heat removal capability of this cooler below the capacity assumed in the accident analysis. Since the 1200 gpm flow rate specified in the SR may not be achieved, due to such factors as service water system supply and discharge pressure variations, the engineering evaluation discussed above has established a baseline value for the existing configuration. This baseline flow rate ensures that sufficient capacity is available to remove post-accident heat loads. In the event this baseline flow rate cannot be achieved, the operability of the green train of reactor building cooling will be evaluated for the existing configuration. During the performance of the green train test, biocide will be added to the service water whenever the service water temperature is between 60°F and 80°F, as required by Specification 4.5.2.1.2(a)(2). This will ensure that a hostile environment is maintained with respect to aquatic lifeforms.

Since the engineering evaluation verified that the "C" Reactor Building cooler is capable of performing its design function in its current configuration, and because continuing testing will ensure cooler operability by detecting the potential for any further system degradation, continued plant operation in this condition will have no impact on plant safety or the health and safety of the public.