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SUBJECT: Application for amend to license DPR-58, modifying TS
 3.3.3.8 to allow pressurizer safety valve position
 indicator monitor to be exempted from TS Table 3.3-11.

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AEP:NRC:1170B

Donald C. Cook Nuclear Plant Unit 1
Docket No. 50-315
License No. DPR-58
UNIT 1 PRESSURIZER SAFETY VALVE POSITION INDICATOR ACOUSTIC
MONITOR EMERGENCY TECHNICAL SPECIFICATIONS AMENDMENT REQUEST

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Attn: T. E. Murley

January 22, 1992

Dear Dr. Murley:

This letter and its attachments constitute an application for an emergency Technical Specifications (T/Ss) change for Donald C. Cook Nuclear Plant Unit 1. Specifically, we are proposing to modify T/S 3.3.3.8 to allow pressurizer safety valve position indicator acoustic monitor QR-107A (Instrument 14 in Table 3.3-11) to be exempted from Table 3.3-11 requirements until the end of the current fuel cycle, Cycle 12, which is anticipated to be June 1992. Currently, the T/Ss only allow this monitor to be inoperable for 30 days, with a subsequent action to be in hot shutdown within the next 12 hours. On January 17, 1992, the analysis of the test data from the monthly surveillance that was performed on January 6, 1992, was completed. This analysis showed that QR-107A was not providing a signal, and QR-107A was declared inoperable. Therefore, we entered the action statement on January 17, 1992, retroactive to the test date of January 6, 1992. Despite our troubleshooting efforts, we have remained in the action statement. This 30-day period expires February 5, 1992, at 1700 hours.

Attachment 1 provides a detailed description of the proposed changes, the justification for the changes including compensatory actions, and our proposed determination of no significant hazards consideration performed pursuant to 10 CFR 50.92. Attachment 2 contains the existing pages marked to reflect the proposed changes. Attachment 3 contains the proposed T/Ss pages. The proposed T/Ss changes are based on Westinghouse Standard T/S 3/4.7.11.

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Dr. T. E. Murley

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AEP:NRC:1170B

We have discussed our situation with our NRC Project Manager, Mr. John F. Stang, and notified him that we would be submitting an emergency T/Ss change request to preclude an unwarranted plant shutdown.

The proposed changes have been reviewed by the Plant Nuclear Safety Review Committee and will be reviewed by the Nuclear Safety and Design Review Committee at their next regularly scheduled meeting.

In compliance with the requirements of 10 CFR 50.91(b)(1), copies of this letter and its attachments have been transmitted to Mr. J. R. Padgett of the Michigan Public Service Commission and to the Michigan Department of Public Health.

This document has been prepared following Corporate procedures that incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature of the undersigned.

Sincerely,



E. E. Fitzpatrick
Vice President

Attachments

dag

cc: D. H. Williams, Jr.
A. A. Blind - Bridgman
J. R. Padgett
G. Charnoff
NFEM Section Chief
A. B. Davis - Region III
NRC Resident Inspector - Bridgman

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1.0 SECTION TO BE CHANGED

Table 3.3-11 of Technical Specification (T/S) 3.3.3.8.

2.0 EXTENT OF CHANGE

We are proposing to delete the 30-day time limit that pressurizer safety valve SV-45A position indicator acoustic monitor QR-107A may be inoperable by exempting it from T/S requirements until the end of Cycle 12, currently scheduled to occur in June 1992. In effect, this makes, Table 4.3-7, which states the post-accident monitoring instrumentation surveillance requirements not applicable to QR-107A. The 30-day time limit is specified in the Limiting Condition for Operation in T/S 3.3.3.8 (Instrument 14 in Table 3.3-11). This proposal is being made as a result of our monthly surveillance, which was unsuccessful in detecting the expected signal level from QR-107A.

3.0 CHANGES REQUESTED

We are proposing to make the following change to the Unit 1 Technical Specifications.

Revise Table 3.3-11, "Post-Accident Monitoring Instrumentation"

Currently, Instrument 14 of Table 3.3-11 has no notes or exceptions. We are proposing to add the following footnote:

*****Pressurizer safety valve (SV-45A)
position indicator acoustic monitor QR-107A
is exempted from the above requirements
until the end of Cycle 12.

4.0 DISCUSSION

System Description

The reactor coolant system is protected against overpressurization by control features, such as the pressurizer sprays and the three pressurizer power-operated relief valves, and protective features, such as the pressurizer pressure high reactor trip and the three pressurizer safety valves. Upon opening, these valves discharge steam into the pressurizer relief tank, which condenses and collects the valve effluent. This submittal addresses the monitoring instrumentation associated with the pressurizer safety valves and the pressurizer relief tank.

Attachment 1 to AEP:NRC:1170B

10CFR50.92 Analysis for Changes to the
Donald C. Cook Nuclear Plant Unit 1
Technical Specifications

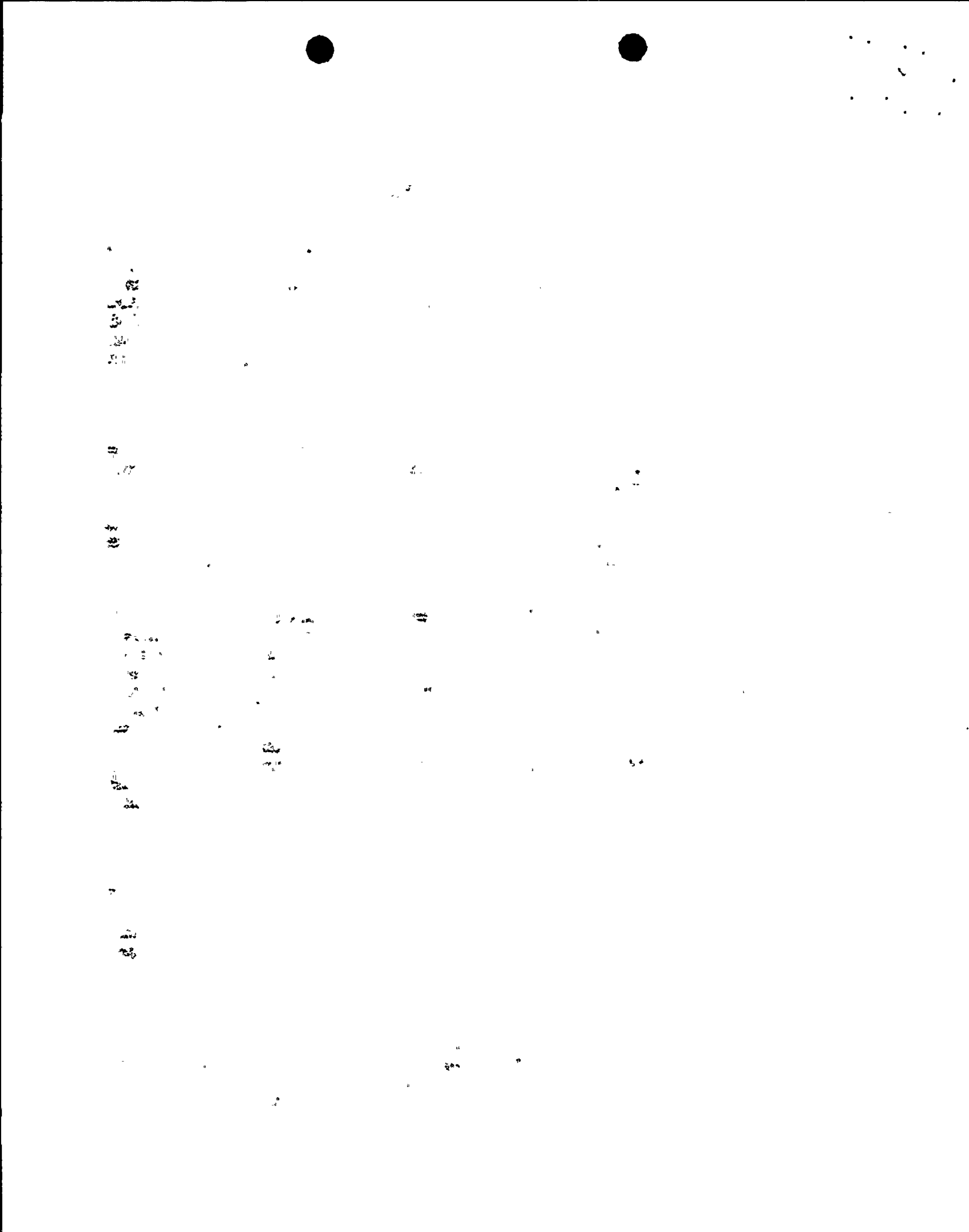
As illustrated in the attached diagram, two independent monitoring systems exist that alert the operator to the passage of steam through the pressurizer safety valves due to valve lift. An acoustic monitor (QR-107A, B, and C) on the discharge of each pressurizer safety valve detects acoustic vibrations generated from the steam flowing through each valve, and actuates an alarm in the control room. Due to the magnitude of the acoustic vibrations and the sensitivity of the instrumentation, all three monitors will sense when any one of the pressurizer safety valves lifts. The acoustic monitors were added to meet the requirements of NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short Term Recommendations," and NUREG-0737, "Clarification of TMI Action Plan Requirements," and are installed to provide the operator with valve position information during post-accident operation. The monitors are environmentally qualified for post-accident operation.

During normal operation the acoustic monitors are not used to detect pressurizer safety valve leakage. A temperature sensor (NTA-151, -152, -153) downstream of the acoustic monitor generates a signal that actuates a control room alarm when a temperature increase is experienced in the line, as would be the case if the pressurizer safety valve released steam. Unlike the acoustic monitors, the temperature monitors are not used for post-accident operation and are not environmentally qualified.

Indication of the temperature, pressure and water level of the pressurizer relief tank is also provided in the control room and provides additional indication of pressurizer safety valve steam flow during normal operation. The temperature of the water in the pressurizer relief tank is measured and indicated by instrument number NTA-351. An alarm resulting from this signal is actuated by high water temperature, and informs the operator that cooling of the tank contents is required. The pressurizer relief tank pressure transmitter (NPA-351) operates a high and low pressure alarm. The pressurizer relief tank level transmitter (NLA-351) provides a signal for a level indication and a high and low tank level alarm. Consequently, a discharge from one of the pressurizer safety valves will cause these instruments to provide an alarm indication in the control room.

Reason for Proposed Technical Specification Change Request

On January 6, 1992, at approximately 1600 hours (EDT), surveillance testing began for the pressurizer safety valve position indicator acoustic monitors. This surveillance involves recording signals from the monitor with a frequency spectrum analyzer. The signal spectrum is analyzed to confirm the existence of amplitude peaks at certain frequencies which are characteristic of the piping and accelerometer



frequency response. Results from the surveillance testing indicated a potential anomaly with regard to acoustic monitor QR-107A: the frequency spectrum was significantly different than had been observed during a previous month's surveillance test and did not indicate amplitude peaks at the expected frequencies. The other safety valve channels (QR-107B, QR-107C) responded normally. The purpose of the frequency spectrum is to identify the accelerometer and piping resonant frequencies which should remain constant during operation. During the same test, the companion monitors on the other two pressurizer safety valves, monitors QR-107B and QR-107C, provided frequency spectrums which were consistent with previous surveillances. In an effort to confirm the operation of QR-107A, a number of attempts were made to create a noise input to the monitor which would be detectable by all three pressurizer safety valve channels. As with the initial test, QR-107A failed to provide the expected response, while QR-107B and QR-107C responded normally. As a result, it was determined that QR-107A may not be capable of performing its design function. Pressurizer safety valve acoustic monitor indicator QR-107A was declared inoperable retroactive to the test date of January 6, 1992.

Extensive troubleshooting of the acoustic monitoring system channel QR-107A has not positively identified the cause of its apparent failure. We believe that the charge converter associated with QR-107A has failed. The components in the control room have been verified to be operating correctly. The only portion of the instrumentation that has not been conclusively tested is the in-containment hardware (accelerometer, charge converter and cabling). Since access to the suspect in-containment hardware is not possible while at power, we are requesting an exemption to the 30-day time period that this instrument may be inoperable as specified in T/S 3.3.3.8 until the end of Cycle 12, which is currently anticipated to occur in June 1992.

Comparison to Unit 2

In our letter AEP:NRC:1170 dated December 16, 1991, we requested a similar expedited T/S change for Unit 2 pressurizer safety valve acoustic monitor QR-107C. The Staff subsequently provided an amendment to the Unit 2 T/Ss on December 23, 1991.

The causes of the failure of the Unit 1 and the Unit 2 acoustic monitors are both unknown. We believe that, for both units, the failed component may be the charge converter. However, the symptoms which allowed us to detect the failure of each of the two devices are entirely different. On Unit 2, the alarm associated with QR-107C was spuriously alarming and clearing. On Unit 1, no alarm occurred in the control room and inoperability was only declared as a result of

the monthly surveillance. While the charge converters are located in different units of the plant, they are exposed to essentially the same high temperature normal operating environment. The charge converters are susceptible to degradation through thermal aging; however, they are environmentally qualified to operate in this environment as well as post-accident environmental conditions. In addition, they are periodically replaced to maintain their qualification within thermal aging limits. In consideration of the above, the apparent failures of these two monitor channels are considered independent, random events.

Justification for Proposed Technical Specification Change

We believe that the period of time that the acoustic valve position monitor channel may be inoperable can be extended until the end of Cycle 12 for the following reasons.

First, the temperature sensor installed downstream of each pressurizer safety valve provides indication and alarm on both the control room panel and the plant computer. Past experience has shown these temperature sensors to be effective leak detection devices.

In addition, this system has shown in the past that when one of the pressurizer safety valves opens, all three pressurizer safety valve acoustic position monitor channels are actuated. This is caused by the channel sensitivity and the fact that the three pressurizer safety valves and their associated acoustic monitor sensors are in close proximity to each other. Thus, if the pressurizer safety valve associated with the inoperable acoustic valve position monitor channel discharges, the remaining two acoustic valve monitor channels would alert the operator.

The pressurizer safety valves discharge into the pressurizer relief tank. The temperature, pressure, and liquid level of the tank are indicated and alarmed in the control room. A change in these parameters would alarm and alert the operator to a pressurizer safety valve discharge condition.

Finally, it should be noted that, when a pressurizer safety valve lifts, it can be heard in the control room, and would therefore alert the operators.

Compensatory Actions

As was done for the inoperable Unit 2 acoustic monitor channel, the Unit 1 procedures have been changed to require weekly channel checks on the discharge line temperature monitors and the pressurizer relief

tank level, temperature, and pressure indications. Upon approval of this exemption, the operations staff will be provided appropriate notification.

5.0 NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

We have evaluated the proposed T/Ss exemption and have determined that it does not represent a significant hazards consideration based on the criteria established in 10CFR50.92(c). Operation of the Cook Nuclear Plant in accordance with the proposed amendment will not:

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

Although the proposed exemption results in the operator having one less source of information on plant status, it does not create a significant increase in the probability or consequences of an accident previously evaluated. Acoustic monitor QR-107A does not perform a function vital to safe shutdown or to the isolation of the reactor or to the reactor coolant system pressure boundary. These monitors were added to meet the requirements of NUREG-0578 and NUREG-0737. Other instrumentation exists that provides the operator with indication of pressurizer safety valve actuation. In addition, the subject acoustic monitor being inoperable will not result in an uncontrolled release of radiation to the environment and will not initiate an accident.

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

As previously stated, the purpose of the acoustic monitor is to provide the operator with information regarding pressurizer safety valve position that may assist in the mitigation of the consequences of an accident. However, the operator has other mechanisms for obtaining equivalent information. In addition, the signals generated by this monitor do not initiate any other equipment actuation, nor will its inoperability initiate any accident. Consequently, the proposed T/Ss change does not create the possibility of a new or different kind of accident from any previously analyzed.

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

The proposed change results in the operator having one less source of information on plant status. Consequently, the margin of safety is reduced slightly. However, we believe this reduction in safety is insignificant for several reasons. First, during normal operations, the operator is provided with other viable flow detection devices to determine pressurizer safety valve position, i.e., the temperature

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sensor (NTA-151) on the discharge line, and pressurizer relief tank level (NLA-351), temperature (NTA-351) and pressure (NPA-351) indications. In addition, previous experience with this system has shown that, when one of the pressurizer safety valves opens, the other two pressurizer safety valve acoustic leak detection channels (QR-107B, C) are actuated. The operators will also be aware of a pressurizer safety valve opening, since it can be heard in the control room.

Finally, based on the above, we believe that having an acoustic monitor inoperable does not warrant the inherent risk associated with reactor and plant shutdown. Thermal cycling from unwarranted plant shutdowns increases the likelihood of reactor vessel embrittlement and unnecessarily challenges the safety systems.

Based on the above, we believe that the unit can continue to be operated safely until the end of the present fuel cycle, Cycle 12. At the end of the present fuel cycle, the in-containment channel hardware will be returned to operable status.

6.0 PENDING T/Ss PROPOSALS IMPACTING THIS SUBMITTAL

There are no other T/Ss proposals under review that impact this submittal.

FROM
DRVS

