

# CATEGORY 1

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SUBJECT: Provides alternatives to two code requirements for VT-2  
 exam of bolted connections. Approval requested no later than  
 970131.

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October 25, 1996

AEP:NRC:0969AY

Docket No: 50-315  
50-316

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

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2  
CODE ALTERNATIVE PROPOSAL ASME SECTION XI, 1989 EDITION  
PARAGRAPHS IWA 5242(a) AND 5250(a)(2)  
VT-2 EXAMINATION OF BOLTED CONNECTIONS

References:

1. Letter, Frederick J. Hebdon to Gary J. Taylor, "EVALUATION OF RELIEF REQUESTS FOR RR-07 AND IWA-5242(a), VIRGIL C. SUMMER NUCLEAR STATION (TAC NOS. M94363 AND M94364), dated April 11, 1996.
2. Letter, George F. Wunder to John L. Skolds, "INSERVICE INSPECTION RELIEF REQUEST - VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 (TAC NO. M89213)", dated December 1, 1994.
3. Letter, David B. Matthews to J. P. O'Hanlon, "EVALUATION OF THE THIRD 10-YEAR INTERVAL INSPECTION PROGRAM PLAN AND ASSOCIATED REQUESTS FOR RELIEF FOR SURRY POWER STATION, UNIT 2 (TAC NO. M89-085), dated August 30, 1995.

The purpose of this letter is to provide alternatives to two code requirements for the VT-2 examination of bolted connections. Cook Nuclear Plant, in accordance with the requirements stated in 10 CFR 50.55a, has adopted the 1989 edition of the ASME Section XI code for the third 10-year interval for units 1 and 2. Upon a thorough review of this code edition, it was determined that compliance with IWA-5242(a) and IWA-5250(a)(2) would be difficult to achieve, subject personnel to unnecessary risk, and increase radiation exposure without a commensurate increase in safety and quality. Alternatives that provide an acceptable level of quality and safety are proposed in accordance with 10 CFR 50.55a(a)(3) in Attachments 1 and 2.

These code alternatives were previously approved for the Virgil C. Summer Plant (references 1 and 2), and the Surry Plant (reference 1 enclosure 2 page 4, and reference 3).

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It is requested that NRC approval of these code alternatives be no later than January 31, 1997, to allow us adequate outage planning time for units 1 and 2.

Sincerely,

A handwritten signature in cursive script that reads "A. Alan Blind".

E. E. Fitzpatrick  
Vice President

jmb

Attachments

cc: A. A. Blind  
A. B. Beach  
MDEQ - DW & RPD  
NRC Resident Inspector  
J. R. Padgett

Attachment 1 to AEP:NRC:0969AY

BACKGROUND INFORMATION AND JUSTIFICATION

CODE RELIEF REQUEST FOR THE VT-2 EXAMINATION OF BOLTED  
CONNECTIONS FOR CLASS 1, 2, AND 3 BORATED SYSTEMS FOR  
THE COOK NUCLEAR PLANT UNITS 1 and 2  
THIRD 10-YEAR INTERVAL

**I. System/Component for which relief is requested**

All class 1, 2, and 3 systems borated for the purpose of reactivity control.

**II. Code Requirements**

ASME Section XI, 1989 edition with no addenda, paragraph IWA-5242(a)(2) requires that system pressure tests be conducted with the insulation removed on bolted connections for class 1, 2, and 3 systems borated for the purpose of reactivity control. Table IWB-2500-1, Category B-P, Items B15.10 through B15.71 requires VT-2 inspection of all pressure retaining boundaries following each refueling outage for class 1 systems. Table IWC-2500-1, Category C-H, Items C7.10 through C7.80 requires VT-2 inspection at or near the end of each inspection period for class 2 systems. Table IWD-2500-1, Categories D-A, D-B and D-C Items, D1.10, D1.20 and D1.30 requires VT-2 inspections at or near the end of each inspection period for class 3 systems.

**III. Basis for code relief**

The implementation of code requirements as written and interpreted in the 1989 edition of the ASME Section XI code for system pressure testing of class 1, 2, and 3 systems and components would be extremely hazardous to Cook Nuclear Plant personnel. Surface temperatures of some components to be VT-2 inspected at operating temperatures and pressures would be in excess of safe contact temperatures. The removal and reinstallation of insulation and scaffolding for the purpose of performing a VT-2 inspection at operating conditions are not consistent with good ALARA practices.

This position is further supported by the following:

Code Case N-533 issued by the ASME Section XI organization which provides an acceptable alternative to the code method for class 1 systems; and

code relief to use the requirements specified in Code Case N-533 has been granted to the V. C. Summer and Surry Power stations.

**IV. Alternative Method**

As an alternative to the requirements of the 1989 edition of the ASME Section XI Code, it is proposed for class 1 systems that the insulation be removed on bolted connections for systems, borated for the purpose of reactivity control, VT-2 examined, and evaluated for evidence of leakage during refueling activities at conditions that may be less than system operating conditions. Additionally a VT-2 inspection at system operating conditions will be performed with the insulation in place prior to returning the unit to service.

Similarly for class 2 and 3 systems, borated for the purpose of reactivity control, the insulation will be removed at conditions that may be less than system operating conditions, and a VT-2 examination and evaluation for evidence of leakage will be performed on all bolted connections. Following this, a VT-2 inspection with insulation in place will be performed

at system operating conditions prior to returning the unit to service.

V. Justification for granting code relief

VT-2 inspection of bolted connections of borated systems at system operating pressures and temperatures would be inconsistent with the nuclear industry's ALARA goals. It is estimated that a total of 6.7 additional man-rem hours would result from implementing this requirement as written during the first refueling outage for unit 1. This additional exposure is attributed to the erection and disassembly of scaffolding, reinstallation of insulation, and the VT-2 inspection at system operating conditions.

Additionally, the potential danger to plant personnel who must perform the VT-2 inspection or support work on or around systems that operate in excess of 500 degrees F is considered an unnecessary risk without a commensurate increase in the safety of the plant and equipment.

Cook Nuclear Plant, due to its ice condenser design, has an open containment sump that is more susceptible to foreign material inclusion. The performance of these VT-2 examinations with insulation removed at system operating conditions (Mode 3) would create a higher potential for foreign material (loose insulation) entering the recirculation sump. This event in turn would cause a restriction of the recirculation pump suction and limit the effectiveness of the emergency core cooling system (ECCS). By allowing Cook Nuclear Plant to perform VT-2 examinations of uninsulated bolted connections at lower temperatures and pressures when the recirculation system is not in operation, significantly reduces the probability of debris in the recirculation system at operating condition thereby, improving the reliability of the ECCS.

Borated system leakage will be manifested at atmospheric conditions in the form of boric acid residue. Prudent evaluation of boric acid residues at safe low energy conditions in the portion of the outage schedule where sufficient time is available for detecting and evaluating leakage and, if necessary, planning for repair is a more effective and conservative method of assuring the code intent of no leakage. The VT-2 inspection at system operating conditions with the insulation in place will most likely detect any leakage not present during the inspection with the insulation removed.

Based on the above, we believe the proposed alternative is a viable method for assuring the safe operating condition of the plant and provides an acceptable level of quality and safety.

Attachment 2 to AEP:NRC:0969AY  
BACKGROUND INFORMATION AND JUSTIFICATION  
CODE RELIEF REQUEST FOR THE VT-3 EXAMINATION OF BOLTS  
ON MECHANICAL CONNECTIONS FOR  
THE COOK NUCLEAR PLANT UNITS 1 and 2  
THIRD 10-YEAR INTERVAL



**I. System/Component for which relief is requested**

All class 1, 2, and 3 bolted systems.

**II. Code Requirements**

ASME Section XI, 1989 edition with no addenda, paragraph IWA-5250(a)(2) requires that if leakage occurs at a bolted connection, the bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100.

**III. Basis for code relief**

The implementation of 1989 edition code requirements for bolted connections requires that all bolts be removed for a VT-3 inspection if, through an evaluation, leakage is suspected. The method stated in paragraph IWA-5250(a)(2) of the 1989 edition of the ASME Section XI code for the evaluation of bolted connections is not the most prudent method compared to the proposed alternative and may cause undue hardship, increase the danger to plant personnel, and result in significant outage time loss without a commensurate increase in safety and quality.

This position is further supported by the following:

the ASME Section XI code organization, in the 1992 edition, recognized the alternate method Cook Nuclear Plant intends to implement for evaluation of leakage at bolted connections; and

code relief was granted to the V. C. Summer Power Station using the direction provided in the 1992 edition of the ASME Section XI code.

**IV. Alternative Method**

As an alternative to the requirements of the 1989 edition of the ASME Section XI Code, we propose to use the requirements specified in the 1992 edition of ASME Section XI code that state if leakage is suspected or discovered at a bolted connection by a VT-2 examination during a system pressure test, the bolt closest to the source of leakage will be removed, and a VT-3 examination will be conducted and evaluated in accordance with IWA-3100(a). When the bolt removed has evidence of degradation, all remaining bolts shall be removed, examined by VT-3, and evaluated in accordance with IWA-3100.

**V. Justification for granting code relief**

Removal of all bolting in a mechanical connection as stated in the 1989 edition of the ASME Section XI code will, in some cases, breach the system requiring unnecessary cooldown of the plant and subjecting the system to contamination. This requirement unnecessarily increases time, radiation exposure, and system contamination without a commensurate increase in safety and quality. The proposed alternative is a viable method for assuring the integrity of bolted connections for Cook Nuclear Plant units 1 and 2 and provides an acceptable level of safety and quality.