

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9606200158 DOC. DATE: 96/06/12 NOTARIZED: NO DOCKET #
 FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M 05000315
 50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana M 05000316
 AUTH. NAME AUTHOR AFFILIATION
 FITZPATRICK, E.E American Electric Power Co., Inc.
 RECIP. NAME RECIPIENT AFFILIATION
 Document Control Branch (Document Control Desk)

SUBJECT: Provides third 10-yr interval in-service pump test plan & requests relief from ASME Section XI requirements.

DISTRIBUTION CODE: A047D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 11+19
 TITLE: OR Submittal: Inservice/Testing/Relief from ASME Code - GL-89-04

NOTES:

| | RECIPIENT ID CODE/NAME | COPIES LTTR ENCL | RECIPIENT ID CODE/NAME | COPIES LTTR ENCL |
|-----------|---------------------------|---------------------|---------------------------|---------------------|
| | PD3-1 LA | 1 1 | PD3-1 PD | 1 1 |
| | HICKMAN, J | 1 1 | | |
| INTERNAL: | AEOD/SPD/RAB | 1 1 | <u>FILE CENTER</u> 01 | 1 1 |
| | NRR/DE/ECGB | 1 1 | NRR/DE/EMCB | 1 1 |
| | NRR/DE/EMEB | 1 1 | NUDOCS-ABSTRACT | 1 1 |
| | OGC/HDS2 | 1 0 | RES/DET/EMMEB | 1 1 |
| | RES/DSIR/EIB | 1 1 | | |
| EXTERNAL: | LITCO ANDERSON | 1 1 | NOAC | 1 1 |
| | NRC PDR | 1 1 | | |

NOTE TO ALL "RIDS" RECIPIENTS:
 PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK,
 ROOM OWFN 5D-5 (EXT. 415-2083) TO ELIMINATE YOUR NAME FROM
 DISTRIBUTION LISTS FOR DOCUMENTS YOU 'DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 15 ENCL 14

C
A
T
E
G
O
R
Y

1

D
O
C
U
M
E
N
T

American Electric
1 Riverside Plaza
Columbus, OH 43215 2373
614 223 1000



AMERICAN
ELECTRIC
POWER

AEP:NRC:0969AM

June 12, 1996

Docket Nos.: 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
RELIEF REQUESTS FOR THE THIRD TEN-YEAR
PUMP IN-SERVICE TEST PLAN

The purpose of this letter is to provide the NRC with a copy of the Donald C. Cook Nuclear Plant's third ten year interval in-service pump test plan, and to request relief from ASME Section XI requirements which have been determined to be impractical to meet.

Attachment 1 contains the relief requests and attachment 2 contains the third ten-year interval in-service pump test plan.

The current in-service pump test program will expire on June 30, 1996. The attached relief requests are being submitted in accordance with 10 CFR 50.55a(f)(5)(iv). This regulation requires that, when the revised in-service test program does not include an ASME Code requirement, the licensee demonstrate to the NRC the impracticality of those requirements within twelve months of the expiration of the current program. We, therefore, request approval of the relief requests by June 30, 1997.

Sincerely,

E. E. Fitzpatrick
Vice President

llg

Attachments

200038

cc: A. A. Blind
C. Charnoff
H. J. Miller
NFEM Section Chief
NRC Resident Inspector - Bridgman
J. R. Padgett

AO4711

9606200158 960612
PDR ADOCK 05000315
PDR

U. S. Nuclear Regulatory Commission
Page 2

AEP:NRC: 0969AM

bcc: S. J. Brewer/D. H. Malin/M. S. Ackerman/R. G. Vasey
D. F. Powell
J. D. Benes
J. A. Kobyra/S. H. Steinhart/S. P. Hodge
J. B. Shinnock
J. S. Wiebe
J. B. Hickman, NRC - Washington, D. C. w/attachment
P. G. Schoepf/F. R. Pisarsky
PRONET w/attachment
DC-N-6015.1

ATTACHMENT 1 TO AEP:NRC:0969AM

IN-SERVICE PUMP TEST PLAN

RELIEF REQUESTS

COOK NUCLEAR PLANT PUMP IST PROGRAM RELIEF REQUEST NO. 1TITLE: Containment Spray Pump Vibration Limits☐ General ☒ SpecificUnit Applicability: ☐ 1 ☐ 2 ☒ 1 and 2PUMP NAME: Containment Spray PUMP NUMBER(S): PP-009SYSTEM: Containment Spray (CTS) FLOW DIAGRAM: 5144 ASME CLASS: 2PUMP FUNCTION: Provide cool water flow to spray the containment atmosphere in a LOCA or steamline break.

RELIEF TYPE

☒ COMPLIANCE WITH CODE REQUIREMENTS IS IMPRACTICAL

ASME CODE TEST REQUIREMENT REFERENCE:
OMa-1988, Part 6, Table 3a
Ranges for vibration test parameters

CODE REQUIREMENT DESCRIPTION: (for centrifugal pumps ≥ 600 rpm)
Acceptable range $\leq 2.5 V_r$ vibration reference value (V_r)
Alert range $> 2.5 V_r$ to $6 V_r$ or > 0.325 in/sec
Required action range $> 6 V_r$ or > 0.70 in/sec

BASIS THAT COMPLIANCE WITH CODE REQUIREMENTS IS IMPRACTICAL:

The design of the CTS pumps utilizes a four vane impeller in a double volute casing. This combination of an impeller with an even number of vanes operating in a casing with two volutes creates a high, reinforced vibration response at the vane passing frequency (7200 cpm). This condition is further compounded by the fact that the quarterly IST tests are performed at only 25% of the pump's design flow. This results in the discharge angle of the impeller flow not matching the stationary volute angle, producing high interaction forces between the impeller and the volutes. This high vane pass frequency amplitude is the major component of overall amplitude and is not indicative of overall pump condition. On this basis, compliance with the referenced acceptance criteria would be impractical due to the burden created by unnecessary repair and replacement of otherwise suitable pump components.

PROPOSED ALTERNATE TESTING:

Acceptable range $\leq 2.0 V_r$
Alert range $> 2.0 V_r$ to $4.0 V_r$ or 1.2 in/sec
Required action range $> 4 V_r$ or 2.0 in/sec

BASIS ALTERNATE TESTING YIELDS ACCEPTABLE LEVELS OF QUALITY AND SAFETY:

Although the overall vibration amplitude is increased over the alert and required action limits of ASME OMa-1988, Part 6, Table 3a, the proposed alternate values are based upon our review of past operating data for these pumps. The values are a more representative basis for trending performance of the containment spray pumps, and as such provide an acceptable level of quality and safety.

COOK NUCLEAR PLANT PUMP IST PROGRAM RELIEF REQUEST NO. 2TITLE: Boric Acid Transfer Pump Axial Vibration Measurement☐

General

☒

Specific

Unit Applicability:

☐

1

☐

2

☒

1 and 2

PUMP NAME: Boric Acid Transfer PumpPUMP NUMBER(S): 1-PP-45-1,2; 2-PP-46-3,4SYSTEM: CVCS-MakeupFLOW DIAGRAM: 12-5131ASME CLASS: 2PUMP FUNCTION: Transfer boric acid solution from storage tank to charging pump suction header.

RELIEF TYPE

☒

COMPLIANCE WITH CODE REQUIREMENTS IS IMPRACTICAL

ASME CODE TEST REQUIREMENT REFERENCE:

OMa-1988, Part 6, Paragraph 4.6.4(a)

CODE REQUIREMENT DESCRIPTION:

On centrifugal pumps, measurements shall be taken in a plane approximately perpendicular to the rotating shaft in two orthogonal directions on each accessible pump bearing housing. Measurement also shall be taken in the axial direction on each accessible pump thrust bearing housing.

BASIS THAT COMPLIANCE WITH CODE REQUIREMENTS IS IMPRACTICAL:

The pump thrust bearing housing is inaccessible. It is very close to the coupling, and safety considerations prevent placement of the probe. In addition, the housing is partially blocked by the impeller adjustment nuts.

PROPOSED ALTERNATE TESTING:

Take measurements in a plane approximately perpendicular to the shaft in two orthogonal directions on each accessible pump bearing housing.

BASIS ALTERNATE TESTING YIELDS ACCEPTABLE LEVELS OF QUALITY AND SAFETY:

Measurements taken in planes perpendicular to the shaft in two orthogonal directions have provided adequate data to evaluate pump performance and condition.

COOK NUCLEAR PLANT PUMP IST PROGRAM RELIEF REQUEST NO. 3TITLE: Supersede OMa-1988 Corrective Action Part 6, Paragraph 6.1☒ General ☐ Specific

Unit Applicability:

☐ 1☐ 2☒ 1 and 2PUMP NAME: Various PUMP NUMBER(S): PP-03, -04, -07, -50, -46, -10, -26, -35, -09, -31; QT-106, -130SYSTEM: All IST Pumping Systems in Table A FLOW DIAGRAM: See Table A ASME CLASS: 2&3PUMP FUNCTION: As listed in Table A

RELIEF TYPE

☒ COMPLIANCE WITH CODE REQUIREMENTS IS IMPRACTICAL

ASME CODE TEST REQUIREMENT REFERENCE:

OMa-1988, Part 6, Subsection 6.1

Acceptance Criteria

CODE REQUIREMENT DESCRIPTION:

OMa-1988, Part 6, Subsection 6.1, First Paragraph, Second Sentence Relative to Action Range. If deviations fall within the required action range of Table 3, the pump shall be declared inoperable until the cause of the deviation has been determined and the condition corrected.

BASIS THAT COMPLIANCE WITH CODE REQUIREMENTS IS IMPRACTICAL:

Compliance with the required acceptance criteria will impose a significant burden if test data cannot be analyzed to determine if a pump is still capable of performing its safety function. Past experience evaluating pump test data clearly indicates a burden will be created by unnecessary extension of Technical Specification LCO durations, unnecessary reportability submittals, unnecessary repairs and replacements of otherwise suitable equipment, and unnecessary component wear due to accelerated testing frequencies.

PROPOSED ALTERNATE TESTING:

OM-1995, Subsection ISTB 6.2.2, Action Range. If the measured test parameter values fall within the required action range of Table ISTB 5.2.1-1 or Table ISTB 5.2.1-2, as applicable, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition is corrected, or an analysis of the pump is performed and new reference values are established in accordance with paragraph ISTB 4.6.

BASIS ALTERNATE TESTING YIELDS ACCEPTABLE LEVELS OF QUALITY AND SAFETY:

It is requested that the corrective action requirements, per ASME OMa-1988, Part 6, Subsection 6.1, be superseded for all pumps included in the IST program. The proposed alternative is to follow subsection ISTB 6.2.2 of ASME OM-1995, "Action Range." When applying the requirements of ISTB 6.2.2, Tables 5.2.1-1 and ISTB 5.2.1-2, the Group A test hydraulic acceptance criteria will be used since all pumps are treated as Group A pumps by ASME OMa-1988.

The current pump IST program trends the test results and replaces the pumps as they approach the IST lower limits. The trending allows for evaluations of system conditions if the test point deviates from the trend path. At that time, the pump is retested or the system conditions are reviewed to determine the cause of the deviation. This type of evaluation is consistent with the current code and is consistent with the 1995 code. On this basis, we are requesting that the corrective actions be established per ASME OM-1995 requirements since the OMa-1988 code does not allow evaluation of test conditions.

DONALD C. COOK NUCLEAR PLANT - UNIT 1
PUMP INSERVICE TEST PROGRAM
TABLE A
PROGRAM SUMMARY

| Pump Service (Drawing No.) | TEST PARAMETERS ^f | | | | | | |
|--------------------------------------|------------------------------|--------------|------------------------------|--|---------------------|-------------------------------|-------------------|
| | Pump Number | Speed (N) | Discharge Pressure (P) | Differential Pressure (ΔP) | Flow Rate (Q) | Vibration Amplitude (V) | Test Frequency |
| Auxiliary Feedwater * (1-5106A) | PP-3W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-3E | No | No | Yes | Yes | Yes | Quarterly |
| | PP-4 | Yes | No | Yes | Yes | Yes | Quarterly |
| Essential Service Water (1-5113) | PP-7W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-7E | No | No | Yes | Yes | Yes | Quarterly |
| Centrifugal Charging (1-5129) | PP-50W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-50E | No | No | Yes | Yes | Yes | Quarterly |
| Boric Acid Transfer (12-5131) | PP-46-1 | No | No | Yes | Yes | Yes ^c | Quarterly |
| | PP-46-2 | No | No | Yes | Yes | Yes ^c | Quarterly |
| Component Cooling Water (1-5135A) | PP-10W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-10E | No | No | Yes | Yes | Yes | Quarterly |
| Safety Injection * (1-5142) | PP-26N | No | No | Yes | Yes | Yes | Quarterly |
| | PP-26S | No | No | Yes | Yes | Yes | Quarterly |
| Residual Heat Removal * (1-5143) | PP-35W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-35E | No | No | Yes | Yes | Yes | Quarterly |

DONALD C. COOK NUCLEAR PLANT - UNIT 1
PUMP INSERVICE TEST PROGRAM
TABLE A
PROGRAM SUMMARY

| Pump Service (Drawing No.) | TEST PARAMETERS ^f | | | | | | |
|---|------------------------------|--------------|------------------------------|----------------------------------|---------------------|-------------------------------|-------------------|
| | Pump Number | Speed (N) | Discharge Pressure (P) | Differential Pressure (ΔP) | Flow Rate (Q) | Vibration Amplitude (V) | Test Frequency |
| Containment Spray ^a (1-5144) | PP-9W | No | No | Yes | Yes | Yes ^d | Quarterly |
| | PP-9E | No | No | Yes | Yes | Yes ^d | Quarterly |
| Diesel Fuel Oil Transfer ^{b,c} (1-5151A & C) | QT-106-AB1 | No | Yes | No | Yes | Yes | Quarterly |
| | QT-106-AB2 | No | Yes | No | Yes | Yes | Quarterly |
| | QT-106-CD1 | No | Yes | No | Yes | Yes | Quarterly |
| | QT-106-CD2 | No | Yes | No | Yes | Yes | Quarterly |
| Spent Fuel Pit Cooling (12-5136) ^g | 12-PP-31N | No | No | Yes | Yes | Yes | Quarterly |
| Jacket Water (1-5151B & D) | QT-130-AB1 | No | No | Yes | Yes | Yes | Quarterly |
| | QT-130-AB2 | No | No | Yes | Yes | Yes | Quarterly |
| | QT-130-CD1 | No | No | Yes | Yes | Yes | Quarterly |
| | QT-130-CD2 | No | No | Yes | Yes | Yes | Quarterly |

a = These pumps are tested on test, bypass, or minimum flow loops per ASME OMA-1988 Part 6, ¶ 3.2.

b = Refer to Comment 1.

c = Refer to Comment 2.

d = Refer to Code Relief Request 1.

e = Refer to Code Relief Request 2.

f = Refer to Code Relief Request 3.

g = Only North Spent Fuel Pit Pump shown here due to the alignment of its cooling train to Unit 1 Component Cooling Water.

DONALD C. COOK NUCLEAR PLANT - UNIT 2
PUMP INSERVICE TEST PROGRAM
TABLE A
PROGRAM SUMMARY

| Pump Service (Drawing No.) | TEST PARAMETERS ¹ | | | | | | |
|--|------------------------------|--------------|------------------------------|----------------------------------|---------------------|-------------------------------|-------------------|
| | Pump Number | Speed (N) | Discharge Pressure (P) | Differential Pressure (ΔP) | Flow Rate (Q) | Vibration Amplitude (V) | Test Frequency |
| Auxiliary Feedwater ^a (2-5106A) | PP-3W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-3E | No | No | Yes | Yes | Yes | Quarterly |
| | PP-4 | Yes | No | Yes | Yes | Yes | Quarterly |
| Essential Service Water (2-5113) | PP-7W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-7E | No | No | Yes | Yes | Yes | Quarterly |
| Centrifugal Charging (2-5129) | PP-50W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-50E | No | No | Yes | Yes | Yes | Quarterly |
| Boric Acid Transfer (12-5131) | PP-46-3 | No | No | Yes | Yes | Yes ^c | Quarterly |
| | PP-46-4 | No | No | Yes | Yes | Yes ^c | Quarterly |
| Component Cooling Water (2-5135A) | PP-10W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-10E | No | No | Yes | Yes | Yes | Quarterly |
| Safety Injection ^a (2-5142) | PP-26N | No | No | Yes | Yes | Yes | Quarterly |
| | PP-26S | No | No | Yes | Yes | Yes | Quarterly |
| Residual Heat Removal ^a (2-5143) | PP-35W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-35E | No | No | Yes | Yes | Yes | Quarterly |

DONALD C. COOK NUCLEAR PLANT - UNIT 2
PUMP INSERVICE TEST PROGRAM
TABLE A
PROGRAM SUMMARY

| Pump Service (Drawing No.) | TEST PARAMETERS ^f | | | | | | |
|---|------------------------------|--------------|------------------------------|--|---------------------|-------------------------------|-------------------|
| | Pump Number | Speed (N) | Discharge Pressure (P) | Differential Pressure (ΔP) | Flow Rate (Q) | Vibration Amplitude (V) | Test Frequency |
| Containment Spray ^a (2-5144) | PP-9W | No | No | Yes | Yes | Yes ^d | Quarterly |
| | PP-9E | No | No | Yes | Yes | Yes ^d | Quarterly |
| Diesel Fuel Oil Transfer ^{b,c} (2-5151A & C) | QT-106-AB1 | No | Yes | No | Yes | Yes | Quarterly |
| | QT-106-AB2 | No | Yes | No | Yes | Yes | Quarterly |
| | QT-106-CD1 | No | Yes | No | Yes | Yes | Quarterly |
| | QT-106-CD2 | No | Yes | No | Yes | Yes | Quarterly |
| Spent Fuel Pit Cooling (12-5136) ^e | 12-PP-31S | No | No | Yes | Yes | Yes | Quarterly |
| Jacket Water (2-5151B & D) | QT-130-AB1 | No | No | Yes | Yes | Yes | Quarterly |
| | QT-130-AB2 | No | No | Yes | Yes | Yes | Quarterly |
| | QT-130-CD1 | No | No | Yes | Yes | Yes | Quarterly |
| | QT-130-CD2 | No | No | Yes | Yes | Yes | Quarterly |

a = These pumps are tested on test, bypass, or minimum flow loops per ASME OMA-1988 Part 6, ¶ 3.2.

b = Refer to Comment 1.

c = Refer to Comment 2.

d = Refer to Code Relief Request 1.

e = Refer to Code Relief Request 2.

f = Refer to Code Relief Request 3.

g = Only South Spent Fuel Pit Pump shown here due to the alignment of its cooling train to Unit 2 Component Cooling Water.

