

ATTACHMENT 2 TO AEP:NRG:0969AM

IN-SERVICE PUMP TEST PLAN

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DONALD C. COOK NUCLEAR PLANT-UNIT 1
ASME OMa-1988 Addenda Part 6
Pump In-service Test Program

- A The pump test program was developed using ASME OMa-1988 Part 6 including clarifications contained in NUREG-1482 ("Guidelines for In-service Testing at Nuclear Power Plants," April 1995) and later editions of ASME/ANSI OM Part 6 and OM Code Subsection ISTB, except for specific code relief requested in accordance with 10CFR50.55a(f)(5)(iii).
- B This program is for the 3rd ten year inspection/test interval; commencing July 1, 1996 for Unit 1.
- C The program was developed employing the classification guidelines contained in Regulatory Guide 1.26, Revision 2 for Quality Groups B and C, and the definition of the reactor coolant system boundary contained in 10CFR50.2(v) for Group A. (Quality Groups A, B, and C are the same as ASME Class 1, 2, and 3, respectively). Table A identifies the following:
- I. The pump number and service it performs along with the identification number of the drawing on which it is found.
 - II. The applicable test parameters:
 - 1. Speed, for variable speed pumps only.
 - 2. Discharge Pressure, for positive displacement pumps only.
 - 3. Differential Pressure-determined as the difference between discharge and suction pressure.
 - 4. Flow rate.
 - 5. Vibration amplitude.
 - III. The test frequency required
- D The Emergency Diesel Generator Fuel Oil Transfer Pumps and the Emergency Diesel Generator Jacket Water Cooling pumps are outside the ASME Code Boundary. In accordance with NUREG 1482 Section 3.4, GL 89-04 Attachment 1, and 10CFR50 Appendix A and Appendix B, these pumps perform a function that is important to safety of the plant. Due to this importance to safety, these pumps will be subjected to periodic testing.

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 ^a (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 ^e | Quarterly |
| | PP-46-2 | No | No | Yes | Yes | Yes ^e | Quarterly |
| Component Cooling Water (1-5135A) | PP-10W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-10E | No | No | Yes | Yes | Yes | Quarterly |
| Safety Injection ^a (1-5142) | PP-26N | No | No | Yes | Yes | Yes | Quarterly |
| | PP-26S | No | No | Yes | Yes | Yes | Quarterly |
| Residual Heat Removal ^a (1-5143) | PP-35W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-35E | No | No | Yes | Yes | Yes | Quarterly |

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

| TEST PARAMETERS ^f | | | | | | | |
|---|----------------|--------------|------------------------------|----------------------------------|---------------------|-------------------------------|-------------------|
| Pump Service (Drawing No.) | 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 1
PUMP INSERVICE TEST PROGRAM
COMMENT 1
Emergency Diesel Generator FOTP

The duration of pump operation for testing , per ASME OMa-1988 Part 6, Subsection 5, Paragraph 5.6; "Duration of Tests", will be amended for the Diesel Fuel Oil Transfer pumps.

These pumps supply the diesel generator fuel oil day tank. A conservative level is maintained in the tank to meet the minimum capacity per Technical Specification requirements. Due to the limited capacity of this tank, the pump operating test range is limited to the time required to fill the tank. Therefore, test parameters will be recorded immediately after pump operation has stabilized.

DONALD C. COOK NUCLEAR PLANT - UNIT 1
PUMP INSERVICE TEST PROGRAM
COMMENT 2
EDG FOTP Vibration Data Points

Vibration measurement requirements, per ASME OMa-1988 Part 6, Subsection 4, paragraph 4.6.4, Vibration Measurements, will be amended for the rotary positive displacement Emergency Diesel Generator Fuel Oil Transfer Pumps. Vibration measurement will be taken at a single point on the gear box adjacent to all four gear shaft bearings. Due to the limited capacity of the tank to which the pump discharges to (EDG Day Tank), the pump operating time is limited and would prohibit recording multiple vibration readings.

COOK NUCLEAR PLANT PUMP IST PROGRAM RELIEF REQUEST NO. 1

TITLE: Containment Spray Pump Vibration Limits

☐

General

☒

Specific

Unit Applicability:

☐

1

☐

2

☒

1 and 2

PUMP NAME: Containment Spray

PUMP NUMBER(S): PP-009

SYSTEM: Containment Spray (CTS)

FLOW DIAGRAM: 5144

ASME CLASS: 2

PUMP 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 ≤ 2.5 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. 2

TITLE: Boric Acid Transfer Pump Axial Vibration Measurement

☐

General

☒

Specific

Unit Applicability:

☐

1

☐

2

☒

1 and 2

PUMP NAME: Boric Acid Transfer Pump PUMP NUMBER(S): 1-PP-45-1.2; 2-PP-46-3.4

SYSTEM: CVCS-Makeup FLOW DIAGRAM: 12-5131 ASME CLASS: 2

PUMP 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. 3

TITLE: Supersede OMa-1988 Corrective Action Part 6, Paragraph 6.1

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General

☐

Specific

Unit Applicability:

☐

1

☐

2

☒

1 and 2

PUMP NAME: Various PUMP NUMBER(S): PP-03, -04, -07, -50, -46, -10, -26, -35, -09, -31; OT-106, -130

SYSTEM: All IST Pumping Systems in Table A FLOW DIAGRAM: See Table A ASME CLASS: 2&3

PUMP 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 2
ASME OMa-1988 Addenda Part 6
Pump In-service Test Program

- A The pump test program was developed using ASME OMa-1988 Part 6 including clarifications contained in NUREG-1482 ("Guidelines for In-service Testing at Nuclear Power Plants," April 1995) and later editions of ASME/ANSI OM Part 6 and OM Code Subsection ISTB, except for specific code relief requested in accordance with 10CFR50.55a(f) (5) (iii).
- B This program is for the 3rd ten year inspection/test interval; commencing July 1, 1996 for Unit 2.
- C The program was developed employing the classification guidelines contained in Regulatory Guide 1.26, Revision 2 for Quality Groups B and C, and the definition of the reactor coolant system boundary contained in 10CFR50.2(v) for Group A. (Quality Groups A, B, and C are the same as ASME Class 1, 2, and 3, respectively). Table A identifies the following:
- I. The pump number and service it performs along with the identification number of the drawing on which it is found.
 - II. The applicable test parameters:
 - 1. Speed, for variable speed pumps only.
 - 2. Discharge Pressure, for positive displacement pumps only.
 - 3. Differential Pressure-determined as the difference between discharge and suction pressure.
 - 4. Flow rate.
 - 5. Vibration amplitude.
 - III. The test frequency required
- D The Emergency Diesel Generator Fuel Oil Transfer Pumps and the Emergency Diesel Generator Jacket Water Cooling pumps are outside the ASME Code Boundary. In accordance with NUREG 1482 Section 3.4, GL 89-04 Attachment 1, and 10CFR50 Appendix A and Appendix B, these pumps perform a function that is important to safety of the plant. Due to this importance to safety, these pumps will be subjected to periodic testing.

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 |
| Auxiliary Feedwater * (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 ^e | Quarterly |
| | PP-46-4 | No | No | Yes | Yes | Yes ^e | Quarterly |
| Component Cooling Water (2-5135A) | PP-10W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-10E | No | No | Yes | Yes | Yes | Quarterly |
| Safety Injection * (2 -5142) | PP-26N | No | No | Yes | Yes | Yes | Quarterly |
| | PP-26S | No | No | Yes | Yes | Yes | Quarterly |
| Residual Heat Removal * (2-5143) | PP-35W | No | No | Yes | Yes | Yes | Quarterly |
| | PP-35E | No | No | Yes | Yes | Yes | Quarterly |

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

| TEST PARAMETERS ^f | | | | | | | |
|---|----------------|--------------|------------------------------|----------------------------------|---------------------|-------------------------------|-------------------|
| Pump Service (Drawing No.) | 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) ^g | 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.

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DONALD C. COOK NUCLEAR PLANT - UNIT 2
PUMP INSERVICE TEST PROGRAM
COMMENT 1
Emergency Diesel Generator FOTP

The duration of pump operation for testing , per ASME OMa-1988 Part 6, Subsection 5, Paragraph 5.6; "Duration of Tests", will be amended for the Diesel Fuel Oil Transfer pumps.

These pumps supply the diesel generator fuel oil day tank. A conservative level is maintained in the tank to meet the minimum capacity per Technical Specification requirements. Due to the limited capacity of this tank, the pump operating test range is limited to the time required to fill the tank. Therefore, test parameters will be recorded immediately after pump operation has stabilized.

DONALD C. COOK NUCLEAR PLANT - UNIT 2
PUMP INSERVICE TEST PROGRAM
COMMENT 2
EDG FOTP Vibration Data Points

Vibration measurement requirements, per ASME OMa-1988 Part 6, Subsection 4, paragraph 4.6.4, Vibration Measurements, will be amended for the rotary positive displacement Emergency Diesel Generator Fuel Oil Transfer Pumps. Vibration measurement will be taken at a single point on the gear box adjacent to all four gear shaft bearings. Due to the limited capacity of the tank to which the pump discharges to (EDG Day Tank), the pump operating time is limited and would prohibit recording multiple vibration readings.

COOK NUCLEAR PLANT PUMP IST PROGRAM RELIEF REQUEST NO. 1

TITLE: Containment Spray Pump Vibration Limits

☐ General ☒ Specific

Unit Applicability: ☐ 1 ☐ 2 ☒ 1 and 2

PUMP NAME: Containment Spray

PUMP NUMBER(S): PP-009

SYSTEM: Containment Spray (CTS)

FLOW DIAGRAM: 5144

ASME CLASS: 2

PUMP 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 ≤ 2.5 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. 2

TITLE: Boric Acid Transfer Pump Axial Vibration Measurement

☐

General

☒

Specific

Unit Applicability:

☐

1

☐

2

☒

1 and 2

PUMP NAME: Boric Acid Transfer Pump PUMP NUMBER(S): 1-PP-45-1,2; 2-PP-46-3,4

SYSTEM: CVCS-Makeup FLOW DIAGRAM: 12-5131 ASME CLASS: 2

PUMP 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. 3

TITLE: Supersede OMa-1988 Corrective Action Part 6, Paragraph 6.1

☒ General ☐ Specific

Unit Applicability: ☐ 1 ☐ 2 ☒ 1 and 2

PUMP NAME: Various PUMP NUMBER(S): PP-03, -04, -07, -50, -46, -10, -26, -35, -09, -31; QT-106, -130

SYSTEM: All IST Pumping Systems in Table A FLOW DIAGRAM: See Table A ASME CLASS: 2&3

PUMP 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.

