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DUKE POWER

October 5, 1995

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

Subject: Catawba Nuclear Station, Unit 2
Docket No. 50-414
Request for Relief 95-04
Submission of Additional Information

Gentlemen:

On September 25, 1995, a conference call was held among representatives of Duke Power Company, NRC personnel, and Idaho National Engineering Laboratory (INEL) personnel concerning the subject relief request. Catawba is submitting this letter to address issues that were raised by NRC and INEL personnel during the call. Specifically, each issue, and our associated response, is contained in the following paragraphs:

1. **The original relief request was submitted pursuant to 10 CFR 50.55a(f)(6)(i) (impracticality of conformance with code requirements). The relief request should more appropriately have been submitted pursuant to 10 CFR 50.55a(a)(3)(i) (proposed alternative that provides an acceptable level of quality and safety) or 10 CFR 50.55a(a)(3)(ii) (hardship or difficulty without a compensating increase in quality and safety).**

Response: By copy of this letter, Catawba is hereby modifying its original submittal dated July 25, 1995, to submit Request for Relief Number 95-04 pursuant to 10 CFR 50.55a(a)(3)(i) and (ii).

2. **The NRC and INEL personnel indicated in the conference call that they would like to obtain a better understanding concerning the details of both the hydrostatic test and the system leakage test. Also desired was a quantification of the burden to be avoided by not having to perform the hydrostatic test.**





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Response: The purpose of the Code-required hydrostatic test (pressure test) is to assure system integrity. The system is pressurized to normal operating pressure and temperature and a visual examination is performed on the pressurized piping. This is accomplished via inspectors walking down the system looking for leakage. This test is performed once every ten years in order to satisfy ASME Section XI hydrostatic test requirements.

The 10 CFR 50 Appendix J test required by Catawba Technical Specifications, which also assures system integrity, is performed every refueling outage. Leakage is quantified by means of flow meters or by measuring the reduction in NW surge chamber level. The leakage test is performed more frequently than the ASME Section XI pressure test.

Refer to Attachments 1 and 2 for a copy of the governing procedure for the ASME Section XI pressure test and the system leakage test, respectively. (Due to the thickness of the entire system leakage test procedure, only a sample enclosure from this procedure for one valve is provided.)

Regarding the quantification of the burden to be avoided by not having to perform the ASME Section XI pressure test, this quantification can be expressed in terms of both person-hour and dose savings. The pressure test requires approximately 35 separate tests for each unit which take approximately 60 minutes each. Each separate test requires the presence of one or two inspectors to look for leakage. Hence, approximately 35 to 70 person-hours could be alleviated by not having to conduct the pressure test. In addition, this test requires support from both plant Operations and Radiation Protection personnel. Radiological dose rates in the areas where the pressure test is conducted range from 2mR/hr to 20mR/hr (general area dose rates). Hence, dose savings range from a minimum of 70mR to a maximum of 1400mR (based on general area dose rates) if the pressure test did not have to be performed.

**3. State the basis for the conclusion that the system leakage test will be an acceptable alternative to the ASME Section XI pressure test.**

Response: As indicated above, the ASME Section XI pressure test only determines whether or not a particular section of NW system piping is leaking. It makes no attempt to quantify observed leakage. Conversely, the system

leakage test performed to satisfy 10 CFR 50 Appendix J and technical specification requirements quantifies overall system leakage and ensures that the system can perform its required function. For the NW system to be considered operable, it must pass the system leakage test acceptance criteria. It is Catawba's position that performance of the ASME Section XI pressure test would result in a burden from both a personnel resource and dose perspective with no corresponding increase in the overall level of quality and safety of the NW system.

If you have any questions pertaining to this material, please call L.J. Rudy at (803) 831-3084.

Very truly yours,

W.R. McCollum

LJR/s

Attachments

xc (with attachments):
S.D. Ebneter, Regional Administrator
Region II

R.J. Freudenberger, Senior Resident Inspector

R.E. Martin, Senior Project Manager
ONRR

bxc (with attachments):
L.J. Rudy
Z.L. Taylor
J.C. Bigham
T.E. Hawkins
J.O. Barbour
NCMPA-1
NCEMC
PMPA
SREC
Document Control File 801.01
Group File 801.01
ELL-EC05O

ATTACHMENT 1

PROCEDURE FOR ASME SECTION XI HYDROSTATIC PRESSURE TEST

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
CONTROLLING PROCEDURE FOR SYSTEM PRESSURE TESTING OF ASME AND ANSI PIPING SYSTEMS AND ASME SECTION XI SUITABILITY EVALUATION

## 1.0 PURPOSE

The purpose of this procedure is to provide a means of performing and documenting pressure tests where a hydrotest or pneumatic test is not required or where periodic inservice inspection (ISI) is required by ASME Section XI and Plant Technical Specifications. This procedure is also to provide guidelines and document completion of suitability of replacements and repairs required by ASME Section XI.

## 2.0 REFERENCES

2.1 Source Documents

2.1.1 ASME Code, Section XI, 1980 through Winter Addenda of 1981

2.1.2 ANSI B31.1, 1973 Edition.

2.1.3 CNS-1206.00-02-1002, Specification for the Procurement of Power Piping Systems Materials and Components.

2.1.4 Duke Power ASME Section XI Manual.

2.1.5 MP/O/A/7650/62, Controlling Procedure For Pressure Testing Of Class A, B, & C Piping Systems.

2.1.6 CNS Directive 3.3.16, Boric Acid Corrosion On Carbon Steel Piping.

2.1.7 Technical Specification 4.0.2, 4.0.3 and 4.0.5

2.2 Applicable QA Procedures

2.2.1 QA Procedure, L-15, ISI Visual Examination, VT-2.

2.2.2 QA A-2 (QA Inspection Requirements for QA Conditions 2, 3, and 4.)

## 3.0 PERSONNEL REQUIREMENTS

3.1 Refer to Work Request Section III.

3.2 ETQS Task No. MM-OT-5008



## 4.0 SAFETY CONSIDERATIONS

4.1 Equipment Clearance and Isolation

None

4.2 Radiation Protection Consideration

If applicable, refer to Radiation Work Permit for Radiation Protection requirements.

4.3 Special Safety Considerations

4.3.1 Use safety belts and other personal safety equipment necessary to perform job in a safe manner.

4.3.2 Piping and equipment could be a potential slipping hazard due to leakage.

4.3.3 Piping in area could be HOT.

## 5.0 UNIT STATUS

Prior to beginning work, refer to Work Order, Section II for clearance to begin work.

## 6.0 PREREQUISITES

6.1 Verify Working Copy and Control Copy of this procedure have been compared and the Working Copy is current.

HOLD: Personnel sign off Cover Sheet and Data Sheet Enclosure 13.1, Section A.

6.2 Reverify Working Copy against Control Copy of procedure every 14 days or after procedure has been inactive until work is completed.

HOLD: Personnel sign off Data Sheet Enclosure 13.1, Section A.

## 7.0 REPAIR PARTS

None

## 8.0 SPECIAL TOOLS

8.1 Flashlight

8.2 Inspection Mirror

8.3 Gloves

8.4 Hearing Protection

8.5 Face Shield

8.6 Arm Protectors

9.0 ACCEPTANCE REQUIREMENTS

9.1 Leakage is not acceptable in piping or welds being inspected.

9.2 Leakage at mechanical joints is to be evaluated by Operations Personnel.

10.0 INTERFERENCE ITEMS

None

11.0 PROCEDURE

11.1 Crew Changes

11.1.1 Prior to crew change, sign off last step of procedure completed.

HOLD: Maint. Rep. sign off Data Sheet Enclosure 13.1, Section C.

11.2 Definitions

11.2.1 **System Leakage Test** - a test conducted on Class A piping and components at nominal operating pressure and temperature. **(no hold time is required after attaining temperature and pressure.)**

11.2.2 **System Functional Test** - a test conducted to verify operability in systems (or components) not required to operate during normal plant operation while under system operating pressure. **(a ten minute hold time is required after attaining operating pressure.)**

11.2.3 **System Inservice Test** - a test conducted to perform visual examination while the system is in service at operating pressure. **(no hold time is required provided the system has been in service for at least four hours.)**

11.2.4 **System Hydrostatic Test** - a test conducted at a pressure above nominal operating pressure.(Refer to MP/0/A/7650/62, System Testing of Class A, B, and C Piping Systems.)

11.2.5 **System Pneumatic Test** - a test similar to a hydrotest normally conducted on air or gas systems at a pressure above nominal operating pressure using air or gas as the pressurizing medium. (Refer to MP/0/A/7650/62)

11.2.6 **Initial Service Leak Test** - a test performed on a Class E, F or H-QA 3 systems at nominal operating pressure. **(a ten minute hold time is required.)**

11.3 Applications for Normal Repair, Replacements, and Maintenance (Refer to Enclosures 13.2, 13.3 and 13.4)

NOTE: CE Representative shall complete step 11.5.1 for any repair or replacement applications.

11.3.1 **ASME Class 1 (Duke Class A)**

11.3.1.1 A system leakage test shall be conducted following opening and reclosing of a component in the system (i.e., refueling) after pressurization to nominal operating pressure.

11.3.1.2 For disassembly and reassembly of mechanical joints, a system leakage test shall be conducted after pressurization to nominal operating pressure.

11.3.2 **ASME Class 2 (Duke Class B)**

11.3.2.1 For disassembly and reassembly of mechanical joints which does not involve replacement of any pressure retaining components. **(no pressure testing is required after reassembly.**

11.3.2.2 For disassembly and reassembly of mechanical joints, which involves replacement of any pressure retaining components, a system functional test shall be conducted to verify operability while under system pressure. **(a ten minute hold time is required.)**

11.3.3 **ASME Class 3 (Duke Class C)**

NOTE: Class C test requires verification by OPS Rep. to verify system conditions.

11.3.3.1 For disassembly and reassembly of mechanical joints which does not involve replacement of any pressure retaining components. **(no pressure testing is required after reassembly.)**

11.3.3.2 For disassembly and reassembly of mechanical joints, which involves replacement of any pressure retaining components, the following test shall be performed after reassembly:

a) For systems not required to operate during normal plant operation, a system functional test shall be conducted to verify operability while under system pressure.**(a ten minute hold time is required.)**

b) For systems required to operate during normal plant operation, a system inservice test shall be conducted. **(no hold time required provided the system has been in operation for 4 hours.)**

11.3.4 **ANSI B31.1 (Duke Class E)**

11.3.4.1 If it is deemed practical to perform a hydrotest or a pneumatic test, the forms of MP/0/A/7650/62 shall be used, with references to the ANII marked "N/A".

11.3.4.2 If these tests are deemed impractical, an initial service leak test at normal operating pressure is required after repair by welding. **(a 10 minute hold time is required prior to inspection of uninsulated systems.)** For insulated systems, contact the CE Representative.

11.3.5 **ANSI B31.1 (Duke Class F)**

11.3.5.1 If it is deemed practical to perform a hydrotest or a pneumatic test, the forms of MP/0/A/7650/62 shall be used, with references to the ANII marked "N/A".

11.3.5.2 If these tests are deemed impractical, an initial service leak test at normal operating pressure is required after repair by welding. **(a 10 minute hold time is required prior to inspection of uninsulated sytems.)** For insulated systems, contact the CE Representative.

11.3.6 **Fire Protection**

For repairs on piping > 1" NPS a pressure test in accordance with MP/0/A/7650/52 is required. For repairs on piping < 1" an initial service leak test is required.**(a 10 minute hold time is required prior to inspection of uninsulated systems.)** For insulated systems, contact the CE Representative.

11.4 Applications-Inservice Inspection (ISI)

This procedure and enclosures shall be used to perform and document all Inservice Inspection required by the ISI program for piping and components.

11.5 Inspection and Evaluation of Components/or Piping

NOTE: Any repair by welding on piping or component > 1" NPS for Class A, B, or C piping or Components will require a pressure test in accordance with MP/0/A/7650/62, Controlling Procedure for pressure testing of Class A, B, and C Piping Systems.

11.5.1 Complete the ASME Suitability Evaluation (refer to Enclosure 13.2) and document information on Section V of the Work Order.

NOTE #1: If pressure boundary components require replacement or repair, an ASME suitability evaluation by the CE Group is required prior to final approval of the Work Order. This shall be performed prior to turning over a Work Order to another group for testing.

NOTE #2: ASME suitability evaluation may be required even if a leakage test is not performed.

NOTE #3: ASME suitability evaluation is required if a hydrotest is performed in lieu of an inservice or functional test.

HOLD: CE Rep. sign off Data Sheet, Enclosure 13.1, Section B.

11.5.2 Complete the information steps on description of test on Enclosure 13.1. (Refer to Sections 11.2 and 11.3)

HOLD: Personnel Initiating Test sign off Data Sheet Enclosure 13.1, Section B.

11.5.3 Verify valve line up for section described in step 11.5.2 is pressurized. (performed from performance or operations procedures.)

HOLD: Ops Rep. sign off Data Sheet Enclosure 13.1, Section B.

11.5.4 Verify normal operating conditions for piping joints to be inspected as specified in step 11.5.2.

HOLD: Ops Rep. sign off Data Sheet Enclosure 13.1, Section B.

11.5.5 Inspect the components and/or piping for evidence of leakage.

NOTE #1: Steps 11.5.3 and 11.5.4 shall be signed off prior to step 11.5.5.

NOTE #2: QA condition 1 pressurized piping shall be performed by VT-2 certified QA Rep.

NOTE #3: QA condition 2, 3, and 4 piping can be performed by NPD or CMD personnel.

HOLD: QA Rep./or Maint Rep. sign off Data Sheet Enclosure 13.1, Section B.

11.5.6 If evidence of leakage is found the following actions are required:

NOTE: **Leakage of welded connections are unacceptable**

- Leaks at mechanical joints are to be evaluated by operations personnel.
- Evaluation shall be documented.

HOLD: Ops Rep. sign off Data Sheet,Enclosure 13.1, Section B.

11.5.7 System was under normal operating conditions while examinations for leakage was being performed.

HOLD: Ops Rep. sign off Data Sheet, Enclosure 13.1, Section B.

11.5.8 Inspect all areas of leakage identified in step 11.5.6 per Station Directive 3.3.16 (Boric Acid Corrosion of Carbon Steel Components)

HOLD: Maint. Rep. sign off Data Sheet Enclosure 13.1, Section B.

11.5.9 Review procedure Data Sheets to verify all sign offs have been properly filled in and information properly documented.

HOLD: Supervisor/or Designee sign off Data Sheet Enclosure 13.1, Section B.

11.5.10 ANII (if applicable) and QA Reviews completed.

HOLD: ANII and/or QA Rep. sign off Data Sheet Enclosure 13.1, Section B.

## 12.0 RESTORATION

None

## 13.0 ENCLOSURES

13.1 Data Sheets

13.2 Guidelines for Suitability Evaluation

13.3 Definitions of Repair and Replace

13.4 Chart of Pressure Test Requirements

FOR INFORMATION ONLY



WO # _____
ISI ID _____

Controlling Procedure For System
Pressure Testing of ASME and ANSI

A. PREREQUISITES

6.1 The Working Copy has been compared with the Control Copy of this procedure and the procedure is correct and current.

Verifier_____ Date_____ Time_____

6.2 The Working Copy has been compared with the Control Copy of procedure every 14 days until work is complete or after procedure has been inactive.

| Verifier | Date / Time |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

B. PROCEDURE CHECKS/DATA

11.5.1 ASME suitability evaluation has been performed and information documented in Section V of the Work Order.

CE Rep. _____ Date _____

FOR INFORMATION ONLY

WO # _____
ISI ID _____

11.5.2 Description of test (Refer to Sections 11.2 and 11.3)

1. Type of pressure test and holding time requirements:

___ **System Leakage Test** (Class A) no hold time is required after attaining nominal operating pressure and temperature.

___ **System Functional Test** (Class B & C*) a ten minute hold time is required after attaining system operating pressure.

___ **System Inservice Test** (Class C*) no hold time is required provided the system has been in service for at least four hours.

___ **Initial Service Leak Test** (Class E,F & H-QA 3) a ten minute hold time is required.

* Class C test requires notification of OPS Representative to verify system operability. (Refer to Section 11.3.3)

Is the section to be tested required to be in operation (i.e. in service) while the plant is in normal operation?

NOTE: This is not an operaility determination. This is to determine the proper test to be performed per IAW ASME Section XI.

Required _____ Not Required _____

SRO or OPS Eng. Staff _____

2. Code or Standard _____

3. Piping Class _____

4. Buried/Embedded/Insulated _____

5. QA Required Yes ___ No ___

6. ANII notified. (QA Condition 1 only)
NOTE: If ANII can not be reached, contact QA Technical Support.

7. Sketch or describe section to be tested using applicable methods (weld numbers, valve numbers, flange numbers, flow\or isometric drawings)

NOTE: All drawings shall be attached to the data sheet.

FOR INFORMATION ONLY



WO # _____
ISI ID _____

8. Remarks or Instructions concerning test:

_____

_____

_____

_____

_____

_____

Personnel Initiating Test _____ Date _____

11.5.3 Valve line up is pressurized

Ops Rep. _____ Date/Time _____

11.5.4 System has been under operating conditions for the period of time requirements identified on Data Sheet, Step 11.5.2.

System Pressure _____ psig

Pressure Inst. No. or Control Room computer point I.D. No.

_____

Ops. Rep. _____ Date _____

FOR INFORMATION ONLY WO #_____
ISI ID _____

11.5.5 Inspection of Components/and or piping

1. Section(s) of piping or components described in step 11.5.2 have been examined for leakage.

   Yes ____ No ____

   List variation _____

2. Optical Aids (type) _____

3. Test Results:

   _____ Acceptable

   _____ Rejectable (any thru wall or weld leakage is rejected.)

   _____ Leakage at mechanical joints or valve

   List any leakage noted _____

   _____

   _____

{QA condition 1 test} QA Rep. _____ VT-2 level_____ Date _____

{QA condition 2,3 o r 4 test} NPD or CMD Rep._____ Date _____

11.5.6 Operations evaluation of leakage noted in step 11.5.5

_____ acceptable

_____ rejectable

If applicable, Boric Acid leakage reported per Station Directive 3.3.16, Boric Acid Corrosion of Carbon Steel Components.

Remarks_____

_____

Ops Rep. _____ Date_____

11.5.7 Verification that system was under normal operating condition through out examinations.

Ops Rep. _____ Date_____

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WO # _____
ISI ID _____

11.5.8 Boric Acid leakage reported per Station Directive 3.3.16, (Boric Acid Corrosion of Carbon Steel Components.)

WO No. _____ (if applicable)

Maint. Rep. _____ Date _____

11.5.9 Procedure completion review has been performed prior to final QA and ANII review.

Supervisor/or Designee _____ Date _____

11.5.10 ANII Review (QA condition 1)_____ Date_____

Final QA Review _____ Date_____

C. Crew Changes

Step 11.1.1

| Maint. Rep. | Procedure Step Completed | Date / Time |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Remarks: _____

_____

_____

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A. The replacement or repair of the following Do Not require an ASME Section XI suitability evaluation by CE.

1. Piping, tubing, and piping components which are 1 inch and less in nominal pipe size.

2. Any non-pressure retaining parts.

3. ≤ 1/2" thickness packing, gaskets, O-rings, bearings bushing, springs, and spacer rings

4. Leak repair injection sealants, structural pump and valve internals unless otherwise specified, stems, valve seats, rubber valve diaphrams, trim shafts, mechanical pump seals, wear plates, impellers, spray nozzles, orifice plates, instruments, electrical conducting and insulating materials.

B. The replacement or repair of the following do require an ASME Section XI suitability evaluation by CE.

1. Piping, tubing, and pipe components which are greater than 1" nominal pipe size.

2. Any pressure retaining parts including: studs, nuts, bolts, valve bodies, valve bonnets, * valve discs, pump casings, pump covers, pump housing, gland plates, mechanical cartridge seals, vessel shells, manway covers, vessel heads, nozzles.

* Discs shall be considered pressure retaining only on valves included in the Section XI IWV program.(as listed in the performance testing program.)

C. CE shall generate a PIR if a pressure boundary component (of Section B above) failed. To determine a failure Refer to Section D. step 2 for guidance.

D. A suitability evaluation should address the following and be documented in Section V of the Work Order.

1. Identify the component(s) being evaluated.

2. Explain why the replacement or repair was required as follows:

(steps a thru f)

a. Preventative Maintenance

b. Typical degradation of a component (see note 2)

c. Failure of a component due to service conditions (see note 2)

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d. Failure of a component that occurred during maintenance, not operation.

e. Failure of a component due to an undesigned, non service condition. (i.e. failure of tubing due to the weight of a human)

f. Other

3. If (c) is chosen, is an identical replacement or repair suitable and why ? Address the cause of failure.

4. If (c) is chosen and and identical replacement is not suitable, generate a SPR to correct the component's specification. The current work order should contain a copy of the SPR and document the project's work order number if possible.

NOTE #1: An evaluation of each replacement or repair must be completed prior to supervisor signoff in W/O Section IX. More than one evaluation may be made if more than one component is replaced or repaired.

NOTE #2: Degradation and failure should be determined with the following guidance. These are not definitions.

Failure is considered abnormal, significant, or important to nuclear safety. This includes:

1. Broken fasteners

2. Crack in a pressure boundary material

3. Erosion, corrosion, or cavitation damage that could approach minimum wall prior to next scheduled inspection.

Degradation includes:

1. Typical damage to valve seating surfaces

2. Typical corrosion build up

3. Galling of threads during disassembly

4. Leakage damage from bolted, pressure seal or screwed joints

NOTE #3: Repair and replacement are defined in Section E of the Duke Power Company ASME Section XI Manual. Repair by welding suitability evaluations are addressed in Section E.

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**Repair**

Repair, as referenced in ASME Section XI IWX-4000 paragraphs (except IWP), is the process of removing or correcting an unacceptable condition (defect) as defined by OIWX-3000 paragraphs, or a condition unacceptable for service by:

a. Removing metal from or adding weld metal to, Section XI pressure-retaining components and their supports, or

b. Tightening, realigning, adjusting, or reworking Section XI supports,

Exemptions from Section XI Repairs

Minimum metal removal for improving sealing surfaces or fit shall not be considered a Section XI repair. Examples are lapping, polishing and skim cuts that do not violate minimum wall thickness. However, if more than .010 inches of metal must be removed, the responsible engineer must be contacted.

**Replacement**

Replacement, as defined in Section XI, IWX-7000 paragraphs, is the addition or substitution of pressure-retaining spare and renewal components, parts or subassemblies on Section XI components, and the addition or substitution of Section XI component supports, support parts, or subassemblies. Replacement includes modification, and system changes to pressure-retaining components , such as rerouting of piping.

* Pressure-Retaining Components - Items that serve as a pressure boundary such as vessel shells, heads and nozzles, pipes tubes and fittings, valve bodies and bonnets, valve discs [1] , pump casings and covers, and bolting which joins pressure-retaining items.

Specifically excluded are item not associated with the pressure retaining function of a component such as: shafts, items, trim, bearings, bushings, wear plates, mechanical seals, packaging, gaskets, seals, and valve seats.

[1] Discs shall be considered pressure-retaining only on valves included in the Section XI IXV Program as listed in performance testing program.

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## TEST REQUIREMENTS

| QA | CLASS | PIPE SIZE | BREAKING AND REMAKING AND PRESSURE BOUNDARY JOINT USING THE SAME MATERIAL | REPLACING A PRESSURE BOUNDARY COMPONENT | CUTTING OUT AND REMAKING WELD |
|---|---|---|---|---|---|
| 1 | A | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | MP/0/A/7650/088 | MP/0/A/7650/088 | MP/0/A/7650/062 |
| 1 | B | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | FUNCTIONAL | MP/0/A/7650/088 | MP/0/A/7650/062 |
| 1 | C | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | FUNCTIONAL | MP/0/A/7650/088 | MP/0/A/7650/062 |
| 2 | E | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | FUNCTIONAL | FUNCTIONAL | MP/0/A/7650/088 |
| 4 | F | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | FUNCTIONAL | FUNCTIONAL | MP/0/A/7650/088 |
| NONE | G | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| NONE | H | LESS THAN OR EQUAL TO 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| | | GREATER THAN 1 IN. | FUNCTIONAL | FUNCTIONAL | FUNCTIONAL |
| 3 | H | LESS THAN OR EQUAL TO 1 IN. | MP/0/A/7650/088 | MP/0/A/7650/088 | MP/0/A/7650/088 |
| | | GREATER THAN 1 IN. | MP/0/A/7650/088 | MP/0/A/7650/052 | MP/0/A/7650/052 |

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CATAWBA NUCLEAR STATION
MAINTENANCE
PROCEDURE PROBLEM REPORTING FORM

Directions: The Requester of a change will complete the information below and identify any problems or discrepancies found in the procedure. The requester will also assign an appropriate priority level. Then route this form to the appropriate Procedure Writer. The Writer will then route this form to either a Job Sponsor or Engineer for approval, as required.

NOTE: Attach additional sheets or red marked copy of procedure as necessary.

Procedure No._____

Procedure Name_____

_____

Section/Step No.

_____ Problem Description_____

_____

_____

_____

Suggested Resolution_____

_____

_____

_____

_____ Problem Description_____

_____

_____

_____

Suggested Resolution_____

_____

_____

Requester signature_____ Date_____

(Mail to Procedure Writing Group - Mail Code: CN03PS)

Priority High Medium Low (Circle one)

Engineering/Job Sponsor Approval_____ Date_____
(Major Change Only)

Resolution incorporated by:_____ Date_____

ATTACHMENT 2

PROCEDURE FOR 10 CFR 50 APPENDIX J SYSTEM LEAKAGE TEST

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
CONTAINMENT PENETRATION VALVE INJECTION WATER SYSTEM
PERFORMANCE TEST

1.0 PURPOSE

1.1 To comply with Catawba Technical Specifications for:

- Total Containment Isolation Valve seat leakage for the NW System

1.2 To comply with Catawba IWV Testing Program requirements for:

- Full stroke of NW check valves

1.3 To verify post maintenance operability for:

- Total Containment Isolation Valve seat leakage for the NW System
- Containment Isolation Valve operability
- NW valve operability

2.0 REFERENCES

2.1 Source Documents

- CN-2569-1.0, NW Flow Diagram
- CN-2223-19, NW System Description
- CN-2561-1.0, Residual Heat Removal Flow Diagram
- CN-2554-1.0, Chemical and Volume Control System Flow Diagram
- CN-2561-1.1, Residual Heat Removal System Flow Diagram
- CN-2553-1.1, Reactor Coolant System Flow Diagram
- CN-2565-2.0, Liquid Radwaste System Flow Diagram
- CN-2565-2.1, Liquid Radwaste System Flow Diagram
- CN-2565-2.4, Liquid Radwaste System Flow Diagram
- CN-2565-2.6, Liquid Radwaste System Flow Diagram
- CN-2573-1.3, Component Cooling System Flow Diagram
- CN-2574-2.2, Nuclear Service Water System Flow Diagram
- CN-2574-2.8, Nuclear Service Water System Flow Diagram
- CN-2599-2.2, Interior Fire Protection System Flow Diagram
- CN-2562-1.0, Safety Injection System Flow Diagram
- CN-2562-1.2, Safety Injection System Flow Diagram
- CN-2562-1.3, Safety Injection System Flow Diagram
- CN-2563-1.0, Containment Spray System Flow Diagram

- Catawba Nuclear Station (CNS) Technical Specifications:
  - 4.6.6.2 NW System Operability
  - 4.0.5 ASME Section XI requirements

- ASME Performance Test Codes: Code on Definitions and Values, Copyright 1971 by ASME

- CNS Operability Evaluation, RE: PIR-0-C88-0294, File No. CN-2223.19-00, October 6, 1988, E.W. Fritz
- Uncertainity, Calibration and Probability by C.F. Dietrich, Copyright 1973.

2.2 References Needed to Perform Procedure

- OP/2/A/6200/19 Containment Valve Injection Water System Operating Procedure

3.0 TIME REQUIRED

As specified in enclosures.

4.0 PREREQUISITE TESTS

None.

5.0 TEST EQUIPMENT

As specified in enclosures.

6.0 LIMITS AND PRECAUTIONS

As specified in enclosures.

7.0 REQUIRED UNIT STATUS

As specified in enclosures.

8.0 PREREQUISITE SYSTEM CONDITIONS

As specified in enclosures.

9.0 TEST METHOD

The penetration(s) for the Containment Isolation Valve(s), CIV(s), under test is (are) aligned to allow seat leakage upstream and downstream of the CIV(s) under test. The CIV(s) is(are) stroked individually to verify flow to the CIV(s) and through associated NW check valves. This flow verification satisfies the full stroke verification requirement of ASME Section XI, Subsection IWV for the following NW check valves:

A - Train

| | | | | |
|---|---|---|---|---|
| 2NW-37 | 2NW-135 | 2NW-159 | 2NW-138 | 2NW-178 |
| 2NW-47 | 2NW-40 | 2NW-171 | 2NW-21 | 2NW-184 |
| 2NW-132 | 2NW-136 | 2NW-172 | 2NW-139 | 2NW-183 |
| 2NW-50 | 2NW-164 | 2NW-196 | 2NW-24 | 2NW-189 |
| 2NW-133 | 2NW-163 | 2NW-197 | 2NW-140 | 2NW-188 |
| 2NW-53 | 2NW-169 | 2NW-201 | 2NW-27 | 2NW-194 |
| 2NW-134 | 2NW-168 | 2NW-202 | 2NW-141 | 2NW-193 |
| 2NW-43 | 2NW-160 | 2NW-17 | 2NW-179 | |

B - Train

| | | | | | |
|---|---|---|---|---|---|
| 2NW-107 | 2NW-206 | 2NW-124 | 2NW-127 | 2NW-131 | 2NW-230 |
| 2NW-111 | 2NW-209 | 2NW-80 | 2NW-98 | 2NW-213 | 2NW-236 |
| 2NW-120 | 2NW-210 | 2NW-123 | 2NW-128 | 2NW-214 | 2NW-235 |
| 2NW-114 | 2NW-70 | 2NW-83 | 2NW-95 | 2NW-218 | 2NW-241 |
| 2NW-109 | 2NW-126 | 2NW-122 | 2NW-129 | 2NW-219 | 2NW-240 |
| 2NW-147 | 2NW-74 | 2NW-86 | 2NW-92 | 2NW-233 | 2NW-246 |
| 2NW-148 | 2NW-125 | 2NW-121 | 2NW-130 | 2NW-224 | 2NW-245 |
| 2NW-205 | 2NW-77 | 2NW-101 | 2NW-89 | 2NW-[illegible] | |

After reclosure of the CIV(s), NW seat leakage for the CIV(s) is measured and recorded. Valve seat leakages are totaled to determine overall leakage for each NW train. Once all testing is complete, affected penetrations and NW supply isolation valves are returned to normal alignment by Operations.

Leakage is measured using either process flowmeters (in cc/min) or by measuring the drop in NW surge tank level over a period of time (10 minutes) and calculating the volume of water per unit time (gallons per minute - GPM).

## 10.0 DATA REQUIRED

- Flow Rate
- Surge Tank Pressure
- Surge Tank Level Change

## 11.0 ACCEPTANCE CRITERIA

11.1 Total containment isolation valve seat leakage for NW Train 2A is less than or equal to 0.7434 gpm with the tank pressure $\geq$ 46.5 psig.

11.2 Total containment isolation valve seat leakage for NW Train 2B is less than or equal to 0.9916 gpm with tank pressure $\geq$ 46.5 psig.

## 12.0 PROCEDURE

NOTES:

1. Only those enclosures for tests being performed need be included with the working copy of this procedure.

2. NW valve positions may be verified to be in the Required Test Position by transferring signatures from the most recent NW System Train alignment.

3. NW solenoid valve positions may be N/A'd in the individual enclosures if NW solenoid valves are failed open. Isolation for the other CIV's not under test will be made by closing the associated manual isolation valve(s) and documenting on the associated enclosure for hand-operated NW valves.

## 13.0 ENCLOSURES

13.1 NW Penetration Alignments

13.2 NW Leakage Test for CIV 2KC-320A

13.2.1 NW Leakage Test for CIV 2KC-320A A - Train Hand Operated NW Valves

13.3 NW Leakage Test for CIV 2KC-333A

13.3.1 NW Leakage Test for CIV 2KC-333A A - Train Hand Operated NW Valves

FOR INFORMATION ONLY

13.4 NW Leakage Test for CIV 2KC-425A

13.4.1 NW Leakage Test for CIV 2KC-425A A - Train Hand Operated NW Valves

13.5 NW Leakage Test for CIV 2NI-121A

13.5.1 NW Leakage Test for CIV 2NI-121A A - Train Hand Operated NW Valves

13.6 NW Leakage Test for CIV 2NI-162A

13.6.1 NW Leakage Test for CIV 2NI-162A A - Train Hand Operated NW Valves

13.7 NW Leakage Test for CIV 2NI-173A

13.7.1 NW Leakage Test for CIV 2NI-173A A - Train Hand Operated NW Valves

13.8 NW Leakage Test for CIV 2NS-29A

13.8.1 NW Leakage Test for CIV 2NS-29A A - Train Hand Operated NW Valves

13.9 NW Leakage Test for CIV 2NS-32A

13.9.1 NW Leakage Test for CIV 2NS-32A A - Train Hand Operated NW Valves

13.10 NW Leakage Test for CIV 2NS-43A

13.10.1 NW Leakage Test for CIV 2NS-43A A - Train Hand Operated NW Valves

13.11 NW Leakage Test for CIV 2NV-10A

13.11.1 NW Leakage Test for CIV 2NV-10A A - Train Hand Operated NW Valves

13.12 NW Leakage Test for CIV 2NV-11A

13.12.1 NW Leakage Test for CIV 2NV-11A A - Train Hand Operated NW Valves

13.13 NW Leakage Test for CIV 2NV-13A

13.13.1 NW Leakage Test for CIV 2NV-13A A - Train Hand Operated NW Valves

13.14 NW Leakage Test for CIV 2NV-89A

13.14.1 NW Leakage Test for CIV 2NV-89A A - Train Hand Operated NW Valves

13.15 NW Leakage Test for CIV 2RN-429A

13.15.1 NW Leakage Test for CIV 2RN-429A A - Train Hand Operated NW Valves

13.16 NW Leakage Test for CIV 2RN-484A

13.16.1 NW Leakage Test for CIV 2RN-484A A - Train Hand Operated NW Valves

13.17 NW Leakage Test for CIV 2WL-805A

13.17.1 NW Leakage Test for CIV 2WL-805A A - Train Hand Operated NW Valves

13.18 NW Leakage Test for CIV 2WL-825A

13.18.1 NW Leakage Test for CIV 2WL-825A A - Train Hand Operated NW Valves

13.19 NW Leakage Test for CIV 2WL-867A

13.19.1 NW Leakage Test for CIV 2WL-867A A - Train Hand Operated NW Valves

13.20 NW Leakage Test for CIV 2WL-A24

13.20.1 NW Leakage Test for CIV 2WL-A24 A - Train Hand Operated NW Valves

13.21 NW Leakage Test for CIV 2KC-305B

13.21.1 NW Leakage Test for CIV 2KC-305B B - Train Hand Operated NW Valves

13.22 NW Leakage Test for CIV 2KC-315B

13.22.1 NW Leakage Test for CIV 2KC-315B B - Train Hand Operated NW Valves

13.23 NW Leakage Test for CIV 2KC-332B

13.23.1 NW Leakage Test for CIV 2KC-332B B - Train Hand Operated NW Valves

13.24 NW Leakage Test for CIV 2KC-338B

13.24.1 NW Leakage Test for CIV 2KC-338B B - Train Hand Operated NW Valves

13.25 NW Leakage Test for CIV 2KC-424B

13.25.1 NW Leakage Test for CIV 2KC-424B B - Train Hand Operated NW Valves

13.26 NW Leakage Test for CIV 2NC-56B

13.26.1 NW Leakage Test for CIV 2NC-56B B - Train Hand Operated NW Valves

13.27 NW Leakage Test for CIV 2NI-152B

13.27.1 NW Leakage Test for CIV 2NI-152B B - Train Hand Operated NW Valves

13.28 NW Leakage Test for CIV 2NI-178B

13.28.1 NW Leakage Test for CIV 2NI-178B B - Train Hand Operated NW Valves

13.29 NW Leakage Test for CIV 2NI-183B

13.29.1 NW Leakage Test for CIV 2NI-183B B - Train Hand Operated NW Valves

13.30 NW Leakage Test for CIV 2NS-12B

13.30.1 NW Leakage Test for CIV 2NS-12B B - Train Hand Operated NW Valves

13.31 NW Leakage Test for CIV 2NS-15B

13.31.1 NW Leakage Test for CIV 2NS-15B B - Train Hand Operated NW Valves

13.32 NW Leakage Test for CIV 2NS-38B

13.32.1 NW Leakage Test for CIV 2NS-38B B - Train Hand Operated NW Valves

13.33 NW Leakage Test for CIV 2NV-91B

13.33.1 NW Leakage Test for CIV 2NV-91B B - Train Hand Operated NW Valves

13.34 NW Leakage Test for CIV 2RF-389B

13.34.1 NW Leakage Test for CIV 2RF-389B B - Train Hand Operated NW Valves

13.35 NW Leakage Test for CIV 2RF-447B

13.35.1 NW Leakage Test for CIV 2RF-447B B - Train Hand Operated NW Valves

13.36 NW Leakage Test for CIV 2RN-404B

13.36.1 NW Leakage Test for CIV 2RN-404B B - Train Hand Operated NW Valves

13.37 ENCLOSURE DELETED

13.37.1 ENCLOSURE DELETED

13.38 NW Leakage Test for CIV 2RN-437B

13.38.1 NW Leakage Test for CIV 2RN-437B B - Train Hand Operated NW Valves

13.39 NW Leakage Test for CIV 2RN-487B

13.39.1 NW Leakage Test for CIV 2RN-487B B - Train Hand Operated NW Valves

13.40 NW Leakage Test for CIV 2WL-807B

13.40.1 NW Leakage Test for CIV 2WL-807B B - Train Hand Operated NW Valves

13.41 NW Leakage Test for CIV 2WL-827B

13.41.1 NW Leakage Test for CIV 2WL-827B B - Train Hand Operated NW Valves

13.42 NW Leakage Test for CIV 2WL-869B

13.42.1 NW Leakage Test for CIV 2WL-869B B - Train Hand Operated NW Valves

13.43 NW Leakage Test for CIV 2WL-A21

13.43.1 NW Leakage Test for CIV 2WL-A21 B - Train Hand Operated NW Valves

13.44 NW Leakage Test for CIVs (Group Testing) A - Train

13.44.1 NW Leakage Test for CIVs (Group Testing) A - Train Hand Operated NW Valves

13.45 NW Leakage Test for CIVs (Group Testing) B - Train

13.45.1 NW Leakage Test for CIVs (Group Testing) B - Train Hand Operated NW Valves

13.46 A-Train Acceptance Criterion 11.1 Verification

FOR INFORMATION ONLY

13.47 B-Train Acceptance Criterion 11.2 Verification

13.48 Flowmeter 2NWFE5070 Calibration

13.49 Flowmeter 2NWFE5060 Calibration

13.50 Level Gauge Diagram for A - Train

13.51 Level Gauge Diagram for B - Train

13.52 Penetration Alignment Valves Not Returned to "As Found" Position

FOR INFORMATION ONLY

ENCLOSURE 13.11

NW LEAKAGE TEST FOR CIV 2NV-10A

3.11.0 TIME REQUIRED

3.11.1 Penetration Alignment and Restoration

Two Nuclear Equipment Operators - 4 hours

3.11.2 NW System Alignment

Two Nuclear Equipment Operators - 2 hours

3.11.3 Test

One Test Coordinator - 1 hour

5.11.0 TEST EQUIPMENT

5.11.1 Pressure Test Gauge
Range 0-200 psig, Accuracy better than or equal to ± 0.25% full scale.

5.11.2 Level Sight Gauge
3/8" Tygon Tubing Manometer, approximately 37" long.

5.11.3 Stopwatch

6.11.0 LIMITS AND PRECAUTIONS

6.11.1 Any work performed in a Radiation Area must be performed under an appropriate Radiation Work Permit.

6.11.2 Do not allow the NW surge chamber of either train to be filled with raw lake water from the Nuclear Service Water System. This will occur if tank level drops beneath the Lo-Lo level setpoint of 21.25" (measured from bottom of tank) AND a "T" signal is present.

6.11.3 If unable to complete a step, return system to "As Found" condition. N/A, initial, and date steps NOT required for system restoration or corrective action.

6.11.4 If the performance of this procedure is suspended for any reason for a period exceeding 24 hours, any modification in place such as open sliding links, lifted leads, or temporary jumpers, must be returned to normal or the proper station modification procedure implemented per Site Directive 4.4.5.

7.11.0 REQUIRED UNIT STATUS

____/____ 7.11.1 Unit 2 is in Mode 5 or 6, or fuel is unloaded from the core.

8.11.0 REREQUISITE SYSTEM CONDITIONS

____/____ 8.11.1 Verify that the YM System is available, to the extent that it can supply makeup to NW Surge Chamber 2A.

____/____ 8.11.2 Ensure that the Nitrogen System is available to pressurize NW Surge Chamber 2A.

ENCLOSURE 13.11
NW LEAKAGE TEST FOR CIV 2NV-10A

____/____ 8.11.3 Ensure that instrument 2NWFE5070 has been calibrated per Enclosure 13.48.

____/____ 8.11.4 Ensure that a pressure test gauge and tygon tubing manometer (used for level indication) is installed on NW Surge Chamber 2A as shown on Enclosure 13.50.

____/____ 8.11.5 Verify that Penetration M347 has been vented and/or drained, per Enclosure 13.1, Page 13 of 27.

____/____ 8.11.6 Verify that the NW System Train A valve alignment has been completed per Enclosure 13.11.1.

NOTE: Those A-Train Hand Operated NW valves not required to be either OPEN OR CLOSED may have their "Required Test Position" blanks and signoffs N/A'd, initialed, and dated at the discretion of the Test Coordinator. Current valve positions may, however, be placed in the "Required Test Position" blanks to track valve positions in preparation for next valve test.

11.11.0 ACCEPTANCE CRITERIA

As specified in Procedure Body.

12.11.0 PROCEDURE

Initial/Date

____/____ 12.11.1 Obtain Shift Supervisor's permission to perform test.

____/____ 12.11.2 Log test into Unit 2 Test Logbook.

____/____ 12.11.3 Notify Unit 2 Nuclear Control Room Operator of test.

____/____ 12.11.4 Verify unit status and prerequisites in Sections 7.11.0 and 8.11.0 are met.

12.11.5 Perform the following:

____/____ 12.11.5.1 Have Control Room Operator close, or verify closed, the following valves:

(√)

____ a. 2NW-35A CONT VLV INJ HDR 2A CONT ISOL

____ b. 2NW-13A SEAL WATER TO 2KC-425A

____ c. 2NW-175A SEAL WATER TO 2NI-173A

____ d. 2NW-180A SEAL WATER TO 2NS-43A

____ e. 2NW-185A SEAL WATER TO 2NI-162A

____ f. 2NW-190A SEAL WATER TO 2NI-121A

____ g. 2NW-195A SEAL WATER TO 2NS-32A

____ h. 2NW-200A SEAL WATER TO 2NS-29A

ENCLOSURE 12.11
NW LEAKAGE TEST FOR CIV 2NV-10A

_____ i. 2NW-46A SEAL WATER TO 2WL-867A, 2RN-484A AND 2RN-429A

_____ j. 2NW-20A NW SURG CHMBR 2A OUTLET VLV

12.11.5.2 Have Control Room Operator open the following NW valve:

___/___ a. 2NW-35A CONT VLV INJ HDR 2A CONT ISOL

12.11.5.3 To obtain permissive signal to open 2NV-10A, perform the following.

___/___
___/___(IV) a. Place a jumper between C-24 and C-53 in 2EATC12 (AB, 577', FF-59) to bypass interlocks for NC flow to Regenerative Heat Exchanger isolation, low pressurizer level, and charging pump running (CNEE-0257-03.03) to allow 2NV-10A to be opened.

12.11.6 Determination of 2NV-10A Leakage by NW Process Flowmeter

12.11.6.1 If NW Surge Chamber 2A Pressure is $\geq$ 54.0 psig, N/A, initial, and date the following substeps. If NOT, perform the following steps.

___/___ a. Have Control Room Operator open 2NW-2, NW SURGE CHMBR 2A N2, to pressurize NW Surge Chamber 2A.

___/___ b. After NW Surge Chamber 2A pressure has reached $\geq$ 54.0 psig (as indicated by installed test gauge or 2NWP5040 in Control Room), have Control Room Operator close 2NW-2, NW SURGE CHMBR 2A N2.

___/___ 12.11.6.2 Record NW Surge Chamber 2A pressure as indicated by test gauge at 2NW5000H.

Pressure = _____ psig.

___/___ 12.11.6.3 Have Control Room Operator open 2NW-20A, NW SURG CHMBR 2A OUTLET VLV.

___/___ 12.11.6.4 Have Control Room Operator open Containment Isolation Valve 2NV-10A.

___/___ 12.11.6.5 Verify that NW flow is present to 2NV-10A by observing response in the NW Surge Chamber 2A level as indicated by tygon tubing manometer or Control Room gauge (2NWP5000).

___/___ 12.11.6.6 Have Control Room Operator close Containment Isolation Valve 2NV-10A.

___/___ 12.11.6.7 Open 2NW-154, NW SURGE CHMBR 2A OUTLET FLOW ELEMENT ISOL.

___/___ 12.11.6.8 Open 2NW-155, NW SURGE CHMBR 2A OUTLET FLOW

ENCLOSURE 13.11
NW LEAKAGE TEST FOR CIV 2NV-10A

ELEMENT ISOL.

____/____ 12.11.6.9 Have Control Operator close 2NW-20A, NW SURG CHMBR 2A OUTLET VLV.

12.11.6.10 If leakage can be measured by 2NWFE5070, perform the following steps. If NOT, N/A, initial, and date the following steps:

____/____ a. Record the leakage flowrate (ml/min) that is measured by 2NWFE5070.

2NV-10A Seat Leakage = _____ ml/min.

____/____ b. Record final NW Surge Chamber 2A pressure as indicated by test gauge at 2NW5000H.

Pressure = _____ psig.

____/____ c. Verify the NW Surge Chamber 2A final pressure in 12.11.6.10.b is $\geq$ 50.5 psig.

____/____ d. Determine actual flowrate of the NW process flowmeter per the calibration curve for 2NWFE5070 on Enclosure 13.48, Flowmeter 2NWFE5070 Calibration, and record _____ ml/min.

____/____ e. Convert ml/min to gpm as follows:

$$Q(gpm) = ml/min \times \frac{1 \text{ gallon}}{3785.422 \text{ ml}}$$

$$Q(gpm) = \_\_\_\_\_ ml/min \times \frac{1 \text{ gallon}}{3785.422 \text{ ml}} =$$

_____ gpm.

NOTE: Step 12.11.6.10.f may be performed out of sequence.

____/____ f. Ensure that the calculation in Step 12.1.6.10.e has been verified.

Initial/Date

Calculation Verified By: _____/_____

____/____ 12.11.6.11 Close 2NW-155, NW SURGE CHMBR 2A OUTLET FLOW ELEMENT ISOL.

____/____ 12.11.6.12 Close 2NW-154, NW SURGE CHMBR 2A OUTLET FLOW ELEMENT ISOL.

NOTE: Section 12.11.7 may be signed off as N/R (Not Required) if leakage was determined in Step

ENCLOSURE 3.1
NW LEAKAGE TEST FOR CIV 2NV-10A

12.11.6.10.

12.11.7 Determination of 2NV-10A Leakage by Surge Chamber Level Change

12.11.7.1 If NW Surge Chamber 2A Pressure is $\geq$ 54.0 psig, N/A, initial, and date the following substeps. If NOT, perform the following steps.

___/___ a. Have Control Room Operator open 2NW-2, NW SURGE CHMBR 2A N2, to pressurize NW Surge Chamber 2A.

___/___ b. After NW Surge Chamber 2A pressure has reached $\geq$ 54.0 psig (as indicated by installed test gauge or 2NWP5040 in Control Room), have Control Room Operator close 2NW-2, NW SURGE CHMBR 2A N2.

___/___ 12.11.7.2 Record NW Surge Chamber 2A pressure as indicated by test gauge at 2NW5000H.

Pressure = _____ psig.

___/___ 12.11.7.3 Mark tygon tubing manometer, indicating the present NW Surge Chamber 2A water level.

___/___ 12.11.7.4 Simultaneously have Control Room Operator open 2NW-20A, NW SURG CHMBR 2A OUTLET VLV, and start stopwatch.

___/___ 12.11.7.5 After sufficient time has elapsed (10 minutes) or tank lo-level alarm (OAC point D3476) is activated (at 36.5" measured from bottom of tank), have Control Room Operator close 2NW-20A, NW SURG CHMBR 2A OUTLET VLV, and simultaneously stop stopwatch.

___/___ 12.11.7.6 Record elapsed time ___:___ minutes:seconds.

___/___ 12.11.7.7 Convert minutes:seconds to minutes as follows:

Total Minutes = Whole Minutes (from Step 12.11.7.6)

$$+ \frac{\text{Seconds (from Step 12.11.7.6)}}{60}$$

Total Minutes = _____ + $\frac{\text{_____}}{60}$ = _____ Minutes.

___/___ 12.11.7.8 Record final NW Surge Chamber 2A pressure as indicated by test gauge at 2NW5000H.

Pressure = _____ psig.

___/___ 12.11.7.9 Verify the NW Surge Chamber 2A final pressure as recorded in 12.11.7.8 is $\geq$ 50.5 psig.

FOR INFORMATION ONLY

ENCLOSURE 13.11

NW LEAKAGE TEST FOR CIV 2NV-10A

___/___ 12.11.7.10 Record the change in NW Surge Chamber 2A water level using the mark placed on the tygon tubing manometer by Step 12.11.7.3 as a zero reference.

Level change = _____ inches.

___/___ 12.11.7.11 Calculate the volume of leakage as follows:

V (gals.) = 1.8443 X ΔH (inches)

V (gals.) = 1.8443 X _____ = _____ gals.

where V = gallons
ΔH = Level Decrease

___/___ 12.11.7.12 Calculate leakage flow rate as follows:

_____ gals. ÷ _____ Total Minutes =
(Step 12.11.7.11) (Step 12.11.7.7)

_____ gpm

NOTE: Step 12.11.7.13 may be performed out of sequence.

___/___ 12.11.7.13 Ensure that the calculations in Steps 12.11.7.7, 12.13.7.11, and 12.11.7.12 have been verified.

Initial/Date

Calculations Verified By: _____/_____

NOTE: Acceptance Criteria 11.1 is dependent on Total A-Train NW-supplied CIV seat leakage. Verification process of Acceptance Criteria 11.1 is performed completely on Enclosure 13.46.

___/___ 12.11.8 Record 2NV-10A seat leakage (Normal Test or Retest) as determined by Section 12.11.6 or 12.11.7 (Steps 12.11.6.10.e or 12.11.7.12) on Enclosure 13.46, Table I.

___/___ 12.11.9 Remove jumper between C-24 and C-53 in 2EATC12
___/___(IV) (AB, 577', FF-59).

12.11.10 Have Control Room Operator close the following NW valve:

___/___ 12.11.10.1 2NW-35A CONT VLV INJ HDR 2A CONT ISOL

___/___ 12.11.11 Inform Operations that Penetration M347 may be returned to "As Found" condition as required by Enclosure 13.1, Page 13 of 27.

___/___ 12.11.12 If A-Train NW testing is to continue, N/A, initial, and date this step. If NOT, inform Operations that all A-Train NW valves are to be realigned for standby readiness per OP/2/A/6200/19.

ENCLOSURE 13.11
NW LEAKAGE TEST FOR CIV 2NV-10A

____/____ 12.11.13 If all A-Train NW testing is complete, perform Enclosure 13.46 calculations and acceptance criteria verification. If NOT, N/A, initial, and date this step.

____/____ 12.11.14 Log test out of Unit 2 Test Logbook.

____/____ 12.11.15 If all NW testing is complete, remove pressure gauge and
____/____I.V. tygon tubing manometer from NW Surge Chamber.

FOR INFORMATION ONLY

ENCLOSURE 13.11.1
NW LEAKAGE TEST FOR CIV 2NV-10A

A-TRAIN HAND OPERATED NW VALVES

| Valve | Valve Name (Location) | Required Test Position | |
|---|---|---|---|
| * 2NW-19 | NW SUPPLY ISOL TO 2KC-425A (AB, 592', GG-HH/61-62, RM 427) | _____ | ____/____ |
| 2NW-22 | NW SUPPLY ISOL TO 2WL-A24 (AB, 576', JJ-62, RM 308A) | CLOSED | ____/____ |
| 2NW-25 | NW SUPPLY ISOL TO 2KC-333A (AB, 576', JJ-62, RM 308A) | CLOSED | ____/____ |
| 2NW-28 | NW SUPPLY ISOL TO 2KC-320A (AB, 576', JJ-62, RM 308A) | CLOSED | ____/____ |
| 2NW-41 | NW SUPPLY ISOL TO 2WL-825A (CV, 557', 56'-248°) | CLOSED | ____/____ |
| 2NW-44 | NW SUPPLY ISOL TO 2WL-805A (CV, 566', 53'-245°) | CLOSED | ____/____ |
| * 2NW-48 | NW SUPPLY ISOL TO 2WL-867A (CV, 560', 49'-164°) | _____ | ____/____ |
| * 2NW-51 | NW SUPPLY ISOL TO 2RN-484A (CV, 560', 51'-175°) | _____ | ____/____ |
| * 2NW-54 | NW SUPPLY ISOL TO 2RN-429A (CV, 563', 56'-195°) | _____ | ____/____ |
| 2NW-157 | NW SUPPLY ISOL TO 2NV-10A (CV, 579', 49'-117°) | OPEN | ____/____ |
| 2NW-161 | NW SUPPLY ISOL TO 2NV-11A (CV, 579', 51'-119°) | CLOSED | ____/____ |
| 2NW-166 | NW SUPPLY ISOL TO 2NV-13A (CV, 580', 45'-116°) | CLOSED | ____/____ |

**CAUTION**
Do not apply excessive torque when closing NW valves.

NOTES:

1. "As Found" and "As Left" valve positions are not required. Operations performs OP/2/A/6200/19 to return NW System to standby readiness upon completion of testing.

2. "Required Test Position" is not necessary for valves marked with "*". Current valve positions may, however, be placed in the "Required Test Position" blanks to track valve position in preparation for next valve test. These blanks may also be N/A'd at the discretion of the Test Coordinator.

FOR INFORMATION ONLY

ENCLOSURE 3 (Page 1 of 1)
NW LEAKAGE TEST FOR CIV 2NV-10A

A-TRAIN HAND OPERATED NW VALVES

| Valve | Valve Name (Location) | Requir | Test Position |
|---|---|---|---|
| 2NW-173 | NW SUPPLY ISOL TO 2NV-89A (CV, 561', 54'-167°) | CLOSED | ____/____ |
| * 2NW-176 | NW SUPPLY ISOL TO 2NI-173A (AB, 565', HH-62, RM 308A) | _____ | ____/____ |
| * 2NW-181 | NW SUPPLY ISOL TO 2NS-43A (AB, 579', JJ-62, RM 427) | _____ | ____/____ |
| * 2NW-186 | NW SUPPLY ISOL TO 2NI-162A (AB, 564', HH-63, RM 308A) | _____ | ____/____ |
| * 2NW-191 | NW SUPPLY ISOL TO 2NI-121A (AB, 567', FF-GG/62, RM 308A) | _____ | ____/____ |
| * 2NW-198 | NW SUPPLY ISOL TO 2NS-32A (AB, 585', GG-62, RM 427) | _____ | ____/____ |
| * 2NW-203 | NW SUPPLY ISOL TO 2NS-29A (AB, 577', HH-62, RM 427) | _____ | ____/____ |

**CAUTION**
Do not apply excessive torque when closing NW valves.

NOTES:

1. "As Found" and "As Left" valve positions are not required. Operations performs OP/2/A/6200/19 to return NW System to standby readiness upon completion of testing.

2. "Required Test Position" is not necessary for valves marked with "*". Current valve positions may, however, be placed in the "Required Test Position" blanks to track valve position in preparation for next valve test. These blanks may also be N/A'd at the discretion of the Test Coordinator.