INSERVICE INSPECTION PROGRAM
1st INTERVAL
for the
VIRGIL C. SUMMER NUCLEAR STATION

REVISION 1

DOCKET NO. 50/395

INSERVICE INSPECTION PROGRAM

1st INTERVAL

for the

VIRGIL C. SUMMER STATION

REVISION 1

DOCKET No. 50/395

OWNER: South Carolina Electric and Gas Company
P.O. Box 764 Main Street
Columbia, South Carolina 29218

PLANT: V. C. Summer Station

Location - Twenty-six miles northwest of Columbia in Jenkinsville, S.C.

CAPACITY: 1 Unit of 900 MWe

PREPARED BY: Larry B. Collier 11-3-82

PROGRAM APPROVALS:

M. D. Quinton 11-3-82
Inservice Inspection Coordinator/Date

A. A. Smith Jr. by [illegible] 11/4/82
Manager, Nuclear Quality Control/Date

Terry A. McAlister for D. R. Moore 11/4/8
QA Manager/Date

[illegible] for O.S. BRADHAM 11/5/82
Manager, V. C. Summer Nuclear Station/Date

[illegible] for CA Price 11/8/82
Manager, Nuclear Engineering/Date

CONCURRENCE:

R.J. Treadaway 11-8-82
Authorized Nuclear Inservice Inspector/Date

1ST INTERVAL INSERVICE INSPECTION PROGRAM
REVISION 1
11/2/82

INTRODUCTION:

This document represents the Inservice Inspection and Testing Program for the V. C. Summer Nuclear Station, Unit 1, pressure retaining components (including supports) which are classified ASME Code Class 1, Class 2 and Class 3.

INSERVICE INSPECTION:

The ISI Program complies with requirements of 10CFR50.55a(b)(2) and 50.55a(g) effective April 17, 1981 and utilizes the ASME Section XI Code, 1977 Edition through and including the Summer 1978 Addenda except as specified in 10CFR50.55a(b)(2)(IV) as a basis for the inservice examinations and tests to be performed during the first 120 months inspection interval. The first inspection interval will be scheduled to begin when the unit is placed into commercial operation.

The ISI Program is presented in the following seven (7) sections:

SECTION I:

Station Administrative Procedure, SAP-145, details the administrative controls for the ISI Program which includes delegation of authority and responsibility for conduct of the ISI Program, qualification requirements for individuals participating in and performing inspections and tests required by the program, and documentation and tracking requirements for the program.

SECTION II - INSERVICE TESTING OF PUMPS, GENERAL TEST PROCEDURE, GTP-001

The pump testing program demonstrates the operational readiness of Code Class 1, 2 and 3 pumps, as applicable, which are required to perform a specific function in safely shutting down the reactor or in mitigating the consequences of an accident. This program is presented in the form of a procedure incorporating tables identifying the pump by number, location, coordinates, relief request (if applicable) and the appropriate Surveillance Test Procedure.

In addition, tables are included to determine the allowable ranges of test parameters, such as pump speed, inlet pressure, differential pressure, flow rate, vibration, bearing temperature, detection instrument type, I.D. number and calibration due date. A Pump Test Summary is included to track the status of successful tests. Also, relief requests are referenced in this procedure and kept under separate tabs as part of the Pump Test Program.

SECTION III - INSERVICE TESTING OF VALVES, GENERAL TEST PROCEDURE, GTP-002

The valve testing program demonstrates the operational readiness of Code Class 1, 2 and 3 valves, as applicable, which are required to perform a specific function in safely shutting down the reactor or in mitigating the consequences of an accident. This program is presented in the form of a procedure, incorporating tables identifying the valve by number, system, description of function, category, class, location, normal position indicator status, test requirement(s), and relief request(s) status. Applicable alternate test(s), stroke time, leak tests and an approved Surveillance Test Procedure are referenced for use during evaluation and interpretation of Test Results.

Specific relief requests are referenced along with proposed alternate test(s). In addition, a table and a data sheet are included to determine the number of Safety and Relief valves to be tested between refueling outages and to record specific data for each of the valves requiring such tests.

SECTION IV - NONDESTRUCTIVE EXAMINATION OF COMPONENTS, GENERAL TEST PROCEDURE, GTP-003

This section provides the nondestructive examination program for the V. C. Summer Nuclear Station. It describes the ASME Code Class 1, 2 and 3 components subject to surface, volumetric and visual (VT-1 and appropriate VT-3) examinations as required by ASME Section XI Code during the first ten year inspection interval.

The NDE Section provides a procedure which establishes the rules necessary to develop, implement and control the plans, schedules and examinations required by ASME Section XI Code. Should it become impractical to perform the required NDE examinations due to unusually high levels of residual radiation, fixed contamination and/or permanent structural interferences, a request for relief will be initiated along with selecting alternate examinations and/or components when such alternate tests are meaningful.

In the procedure, Sections 4.4 and 4.5 identify those items or types of items requiring the code examinations. In some cases, such as Class 1 and 2 piping systems, the items to be examined are identified by the type and percentage based upon the ASME Section XI Code, 1977 Edition through the 1978 Addenda requirements.

SECTION IV (Continued)

When welds requiring specific seismic analysis, as required by the code, have been identified, GTP-003 will be revised to reflect the required examinations of such welds. A table is also included in the procedure identifying the category, item number, general description, examination method, total items in general description, examination amount and extent, examination period, intended examination % and relief request/remarks. In addition isometric sketches are identified and provided under separate binder identifying the system, class and appropriate Inservice Inspection Weld Numbers.

Since design geometric discontinuities may exist at the point of interest, meaningful ultrasonic examinations and surface examinations may not be practical. However, a best effort examination will be performed and so noted on the inspection data sheet.

Due to their anomalous nature, certain material product forms, such as austenetic stainless steel, may not lend themselves to meaningful ultrasonic examinations in the root areas of the weld with the present "State of the Art" methods available. Therefore, ultrasonic examinations will be performed on a best effort basis using the "State of the Art" methods available at the time the examination is performed.

SECTION V - INSERVICE INSPECTION SYSTEM PRESSURE TESTING, GENERAL TEST PROCEDURE, GTP-004

This section provides the System Pressure Test Program Plan. It describes the ASME Code Class 1, 2 and 3 components subject to the pressure tests as required by ASME Code Section XI during the first ten year inspection interval.

The program is presented in the form of a procedure incorporating tables to identify the type of component, required tests, examination method, inspection frequency and references for specific activities performed during the test.

In addition, tables are incorporated to identify the system/subsystem designation, code class, description of system/subsystem, Surveillance Test Procedure and the applicable flow drawing. Relief requests are identified in GTP-004 and provided under separate binder identifying the system/subsystem, name of item and class of item to be tested.

SECTION VI - INSERVICE INSPECTION OF COMPONENT SUPPORTS, GENERAL TEST PROCEDURE, GTP-005.

This section provides the component support examination program plan. It describes the ASME Code Class 1, 2 and 3 component supports and other component supports listed in the Plant Technical Specification subject to the examination requirements of ASME Section XI Code and the Technical Specification during the first ten year interval.

The required testing and visual examinations shall be documented in accordance with the applicable Surveillance Test Procedures. In the event circumstances such as radiation/contamination levels, geometric design, building structural design or other unforeseen factors require such action, provision for relief request has been made in this procedure.

SECTION VII - REPAIR PROGRAM

A program has been developed in accordance with requirements of the Code to perform repairs on those Code Class 1, 2 and 3 items and other safety related systems and structures.

The repair program is presented in the form of four (4) procedures:

(1) SAP-304, "ASME Code, Section XI Repair Program".

(2) SAP-302, "Administration of Maintenance Welding".

(3) WM-1.0, "Welding Manual Procedure".

(4) WM-2.0, "Welding Material Procedure".

(1) SAP-304, ASME CODE, SECTION XI REPAIR PROGRAM:

This procedure was developed to establish a repair program in conjunction with the Inservice Inspection Program. Included in this procedure are:

a. Responsibilities

b. Documentation Requirements

c. Disposition of Repair Methods

d. Implementation Requirements

e. Review and Approval Requirements

f. Interfacing Requirements

(2) SAP-302, ADMINISTRATION OF MAINTENANCE WELDING:

This procedure establishes the means for developing, implementing and maintaining the controls for the maintenance welding program. Included in this procedure are:

a. Responsibilities

b. Training and Qualification Requirements

c. Documentation Requirements

d. Material Control Requirements

e. Welding and Brazing Activity Control Requirements

f. Welding by External Organization Requirements

g. Authorized Nuclear Inservice Inspector Involvement

(3) WM-1.0, WELDING MANUAL PROCEDURE:

This procedure was developed as part of the repair program to provide the necessary rules for controlling welding and brazing activities, thus ensuring the requirements have been met for code and safety-related items. Included in this procedure are:

a. Training of Welders and Brazers

b. Qualification of WPSs and BPSs

c. Procedure Qualification Tests

d. Standard Qualification Tests

e. Acceptance Criteria of Qualification Tests

f. Documentation of Welding and Brazing Activities

g. Welding Activities

h. Brazing Activities

i. Repair of Weld Metal and Base Metal Defects

j. Defect Removal and Cavity Preparation of Weld Metal and Base Metal

k. Post Weld Heat Treatment

l. Post Braze Heat Treatment

m. Non-destructive Examination

n. Calibration

(4) WM-2.0, WELDING MATERIAL CONTROL:

This procedure was developed to establish and implement the methods for controlling, procuring, storing, issuing and proper disposition of unused and used welding electrodes. Included in this procedure are:

a. Responsibilities

b. Practices of Handling Materials

c. Documentation

d. Rod Room Control of Welding and Brazing Material

e. Rod Room Issuance Control of Welding and Brazing Material

f. Field Control of Welding and Brazing Material

g. Rod Room Return Control of Welding and Brazing Material

Where conformance with certain code requirements is impractical, requests for relief [1] and/or explanatory comments are referenced into each section with supporting information and proposed alternatives.

Each section of this program used as controlled copies is indexed and tabbed for convenience of retrieval, planning, controlling and scheduling those activities necessary to achieve timely results.

[1] Reference 10CFR50.55a(g)(5)(iii)

Augmented examinations, if required by the NRC, [2] are included as part of this program. Examples of these are those required for the Reactor Coolant Pump Flywheels, Steam Generator Tubes and Component Supports. Each Reactor Coolant Pump Flywheel will be inspected in accordance with Regulatory Guide 1.14, Revision 1, August 1975. In addition to the requirements of this program and ASME Section XI Code, eddy current examination of the Steam Generator Tubes and the visual examination and functional test of snubbers will be performed to meet the requirements of the plant Technical Specification. The examinations and tests will be performed utilizing procedures and personnel which meet the requirements of the plant Technical Specification.

Providing revision to any of the procedures captioned herein will not delete any of the requirements specified in the codes or other applicable standards, any procedure may be revised without further revision to the Inservice Inspection Program. In all cases, the latest approved revision of the applicable procedure shall become part of the Inservice Inspection Program.

---

[2] Pursuant to 10CFR50.55a(g)(6)(ii)

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NUCLEAR OPERATIONS
COPY NO. 50

STATION ADMINISTRATIVE PROCEDURE

SAP-145

INSERVICE INSPECTION

REVISION 0

JULY 12, 1982

NON-CONTROLLED
COPY

Larry B. Collier 9-1-82
ORIGINATOR (of this revision) Date

M D Quinton 9-16-82
ASST MGR MAINTENANCE SERVICES Date

Approved:

O S Bradham 9/23/82
PLANT MANAGER Date

REVIEWED BY PSRC

Date Issued: SEP 2 8 1982

J L Connelly 9/27/82
CHAIRMAN DATE

LIST OF EFFECTIVE PAGES

Page	Revision
i	0
ii	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
ATTACHMENTS	
Attachment I	0
Attachment II	0

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this procedure is to provide the administrative guidelines, coordination and interface control for Nuclear Operations personnel in the administration of the Inservice Inspection Program as required by 10 CFR 50.55 a(g).

2.0 SCOPE

This procedure is applicable to all station organizational elements responsible for performing inservice inspection activities required by 10 CFR 50.55 a(g).

3.0 REFERENCES

3.1 10 CFR Part 50.55 a(g)

3.2 Virgil C. Summer Nuclear Station Facility Operating License and Technical Specifications.

3.3 South Carolina Electric and Gas Company Operational Quality Assurance Plan.

3.4 ASME Code, Section XI, 1977 Edition, through and including the Summer 1978 addenda.

3.5 GTP-001 General Procedure for Inservice Testing of Pumps.

3.6 GTP-002 General Procedure for Inservice Testing of Valves.

3.7 GTP-003 General Procedure for Nondestructive Examination for Inservice Inspection.

3.8 GTP-004 Inservice Inspection System Pressure Testing.

3.9 GTP-005 Inservice Inspection for Component Supports.

3.10 SAP-108 Station Staff Qualifications and Training.

4.0 DEFINITIONS

4.1 Authorized Nuclear Inservice Inspector (ANII or ANI) - An inspector employed by an insurance company authorized to write boiler and pressure vessel insurance and having qualified in accordance with the requirements of ANSI/ASME N626.1-1975.

4.2 Code - ASME Boiler and Pressure Vessel Code, Section XI (Reference 3.4) except as modified by 10 CFR50.55A(B)(2)(IV).

4.3 Code Class - A Classification of items and Components based upon Section III Code subsection used in the Construction of such items.

4.3.1 Class 1 - Subsection NB

4.3.2 Class 2 - Subsection NC

4.3.3 Class 3 - Subsection ND

4.3.4 Class MC - Subsection NE

4.3.5 Component Supports Subsection NF

4.4 Code Category Designation - A designation used by the code to delineate the major type(s) of parts to be examined within a Code Component or a selected group of Code Components, as applicable.

4.5 Code Item Number - A number used by the Code to specify: The type of part to be examined, the examination requirements, the examination method, the acceptance standard, the extent and frequency of examination and, if permitted, the deferral of inspections.

4.6 Commercial Service - The date of placement of the power unit into commercial service as defined by the regulation of the Federal Power Commission Chapter 1 Title 18 Code of Federal Regulations.

4.7 Component Supports - Those metal supports that are designed to transmit loads from the component and piping to the load carrying building and/or foundation structures and those elements used to support the weight or provide structural stability.

4.8 Examination - The performance of all required visual observation and nondestructive testing such as radiography, ultrasonic, liquid penetrant, magnetic particle, and eddy current methods.

4.9 Inservice Inspection Coordinator (ISI Coordinator) - That person designated by the Manager, V. C. Summer Nuclear Station, who is responsible for development and implementation of the ISI Program.

4.10 Inservice Inspection Program (ISI Program) - Those planned and systematic actions performed to: Categorize the area subject to inspection and responsibilities, provide accessibility, apply testing and examination, and inspection methods, apply procedures, qualify personnel, establish frequency of inspection, establish and maintain record keeping and reporting requirements, evaluation of inspection and Corrective action of such results, and document a repairs program.

4.11 Inspection Interval - That amount of time approximately equal to 1/4 of expected plant life. (10 years)

4.12 Inspection Period - That amount of time in Calendar years and/or months approximately equal to 1/3 of an inspection interval. (3 to 4 years)

4.13 Regulatory Authority - A Federal Government Agency such as the USNRC.

4.14 Replacement - The addition of spare component(s) parts of component(s), appurtenances, piping subassemblies, rerouted piping but not the addition of new complete systems.

4.15 Rework - Repair or replacement activities or a combination thereof required to return an item to a condition acceptable to the Code.

4.16 Repair - Welding rework activities, including initial and final finishing processes, required to return an item to a condition acceptable to the code.

4.17 Recordable Indication - An indication requiring evaluation by qualified personnel.

4.18 Rejectable Indication - An evaluated indication of an item or component requiring repair, rework, monitoring, analysis or a combination thereof.

5.0 RESPONSIBILITY

5.1 The Manager, V. C. Summer Nuclear Station, is responsible for the overall implementation of the Inservice Inspection Program.

5.2 The ISI Coordinator shall be responsible for, but not limited to:

5.2.1 Coordinating activities between various work and support groups as necessary to implement the required nondestructive examinations including the following:

A. Operations

B. Maintenance

C. Station Quality Control

D. Technical Support

E. Health Physics

F. Support Services

5.2.2 Scheduling and, if necessary, timely rescheduling of the required NDE,

5.2.3 Designating required tests or examinations, as applicable, after repair, rework and/or replacement activities,

5.2.4 Coordinating evaluation of NDE recordable indications,

5.2.5 Performing review and evaluation of test results,

5.2.6 Initiating an off normal occurrence report(s) when required.

5.2.7 Coordinating disposition and, if necessary, corrective measures implemented for unacceptable examination and test results by initiating and/or identifying.

A. Pre-Approved Dispositions

B. NCN(s)

C. MWR(s), or

D. A combination thereof, where applicable.

5.2.8 Upon receipt, temporary Maintenance of required records and documents and, when required, submittal of such records to the Assistant Manager - Support Services for permanent storage and maintenance,

5.2.9 When required, submitting a copy of the NIS-1 Form and other specified records and documents to the Assistant Manager - Technical Support,

5.2.10 Promptly notifying the Assistant Manager - Maintenance Services and the Assistant Manager Operations of unacceptable test results for appropriate corrective action and/or rescheduling of specified tests, as applicable.

5.2.11 Maintaining a summary of examination and test results.

NOTE: This summary may be a chart, graph, table or other appropriate document(s) defining the date and results of test.

5.2.12 Interfacing with NRC Inspectors who are auditing the ISI Program.

5.3 The Assistant Manager - Maintenance Services shall be responsible for supporting the ISI Coordinator in the performance of examinations and tests by.

5.3.1 Removing access plates, covers, collars, restraints insulation, etc.,

5.3.2 Providing platforms, scaffolding and equipment supporting structures as required,

5.3.3 Performing rework, repair and/or replacement activities as required to return an item or component to an acceptable condition.

5.3.4 Placement and operation of hydrostatic, pneumatic, and/or leakage test equipment, instrumentation and gages as required for testing under direct guidance of operations personnel,

5.3.5 Developing and maintaining a welding repair program which satisfies the requirements of the code,

5.3.6 Performing any required bench tests.

5.3.7 Reviewing procedures and certification records and other supporting documentation of Contractor personnel performing repairs and testing.

5.3.8 Informing the ISI Coordinator when repair, rework or replacement activities affect those items specified in the General Test Procedures.

<u>NOTE</u>: The Assistant Manager, Maintenance Services shall have the responsibility and accountability for functioning as the ISI Coordinator.

5.4 The Assistant Manager - Operations shall be responsible for supporting the ISI Coordinator in the performance of examinations and applicable tests by:

5.4.1 Attaching safety tags to appropriate equipment and/or systems, when required.

5.4.2 Directing hydrostatic and/or leakage tests and performing concurrent visual examinations,

5.4.3 Draining appropriate piping systems/subsystems or other components as required,

5.4.4 Developing and Reviewing applicable Surveillance Test Procedures for compliance to the ISI Program.

5.4.5 Performing applicable operational tests on specified equipment in accordance with approved Surveillance Test Procedures.

5.4.6 Promptly transmitting recorded results of specified tests to the ISI Coordinator.

5.5 The Assistant Manager - Support Services shall be responsible for supporting the ISI Coordinator in the performance of examinations and applicable tests by:

5.5.1 Scheduling and, if necessary, timely rescheduling of applicable tests for specified pumps and valves,

5.5.2 Maintenance and storage of required records and documents after receipt from the ISI Coordinator,

5.5.3 Tracking test results of pumps and valves modifying testing schedule as necessary.

5.5.4 When practical, scheduling NDE concurrent with other activities during maintenance outages.

5.6 The Assistant Manager - Technical Support is responsible for supporting the ISI Coordinator in the performance of applicable tests and examinations by:

5.6.1 Providing engineering disposition for unacceptable test and examination results as required by an NCN.

5.6.2 Maintaining liason between the regulatory authority and other S.C.E.&G. N/O Supervisors and Coordinators through licensing engineering,

5.6.3 Submitting programs or plans and schedules to the regulatory authority and coordinating such activities through the Assistant Manager, Support Services.

5.6.4 Submitting examination and test results, evaluation of test results and corrective measures implemented to the regulatory authority, as required,

5.6.5 When required, submitting repair and/or rework records to the regulatory authority,

5.6.6 Filing the completed Inservice Inspection Report (NIS-1 Form) with the regulatory authority within 90 days after the completion of the Inservice Inspection.

5.7 The Director of Station Quality Control is responsible for the following NDE Activities:

5.7.1 Directing and managing non-destructive examinations.

5.7.2 Examination evaluations.

5.7.3 Procuring and Maintaining liaison with Contractor(s).

5.7.4 Interfacing with the ISI Coordinator including:

A. Promptly transmitting identified unacceptable examination results to the ISI Coordinator.

5.7.5 Review of procedures, qualification records, reports, demonstration records and other supporting documentation for accuracy and adequacy.

5.7.6 Performing any needed additional examination and investigations for resolution of examination results.

5.7.7 Preparation of required records, reports and documents.

5.7.8 When required, initiating NCN(s) for unacceptable NDE results.

5.7.9 Transmitting records, reports and other supporting documentation, including the NIS-1 Form, to the Assistant Manager, Support Services, for permanent maintenance and storage.

5.7.10 Transmitting a copy of the NIS-1 Form to the ISI Coordinator.

5.7.11 Training scheduling for unescorted personnel performing NDE.

5.7.12 Performing other activities as deemed necessary by Nuclear Quality Control and the affected Nuclear Operations Department.

5.8 Respective department heads may appoint designated alternate(s) to perform any or all of the specified activities or functions as described in 5.1 through 5.6 of this procedure.

6.0 PROCEDURE

6.1 Preservice Inspection

6.1.1 The Preservice Inspection Program was implemented to assure initial operational performance of Code Class 1, 2 and 3 Components.

6.1.2 The results of preservice inspection provide initial data to be used for:

A. Baseline Component operational performance data,

B. NDE baseline data,

C. Reference values for future acceptance criteria,

D. Pre-operational equipment test acceptance criteria, 6.1.3 Preservice Baseline Data was compiled in accordance with ASME Code Section XI 1974 Edition through and including the Summer 1975 addenda and in accordance with the Preservice Inspection Program.

6.2 Inservice Inspection Program (ISI Program)

6.2.1 The ISI Program, including the repair program, shall be used to reasonably assure operational performance of Code Class 1, 2 and 3 Components is maintained throughout the service life of the affected Component.

6.2.2 Examinations, tests and repairs shall be performed in accordance with the requirements of the ISI program.

6.2.3 The ISI program will consist of this procedure and 9 additional written approved procedures which outline the administrative and specific requirements of the applicable examination, test or repair. The 9 additional procedures will be as follows:

A. GTP-001 General Procedure for Inservice Testing of Pumps

B. GTP-002 General Procedure for Inservice Testing of Valves

C. GTP-003 General Procedure for Nondestructive Examination for Inservice Inspection

D. GTP-004 Inservice Inspection System Pressure Testing

E. GTP-005 Inservice Inspection for Component Supports

F. SAP-304 ASME Section XI Repair Program

G. SAP-302 Maintenance Welding Program

H. WM1.0 Welding Manual Procedure

I. WM2.0 Welding Material Control

6.2.4 Each procedure in the ISI Program will either detail or reference the appropriate controls to be used in the administration of the ISI Program.

6.3 Contractor Activities

6.3.1 Procedures, qualification records, certification records, demonstration records and other supporting documentation of Contractor personnel shall be reviewed for accuracy, adequacy and compliance to the Code prior to their performing examinations, testing or repairs, as applicable.

6.3.2 NDE Personnel qualification records shall be submitted to SCE&G Q.C. and Q.A. for review and approval prior to such personnel performing testing or examinations.

6.3.3 Personnel performing examinations, tests, repairs or welding activities shall be qualified to perform such activities by the department heads, contractors, subcontractors or other appropriate departments in accordance with the requirements of the Code.

NOTE: ISI Contractors shall obtain a "Release to Work" from SCE&G Q. A. prior to performing any work at the V. C. Summer Nuclear Station.

6.4 Inservice Inspection Activities (Pump Testing)

6.4.1 Only those pumps which meet all of the following criteria need to be included in the ISI program.

A. Class 1, 2 and 3 Centrifugal and positive displacement pumps

B. Needed to perform a specific function in shutting down the reactor to a Cold shutdown condition

C. Needed to mitigate the consequences of an accident

D. Provided with an emergency power source except those supplied with emergency power solely for operating convenience

6.4.2 Each pump identified in accordance with the criteria of 6.4.1 shall be tested in accordance with the requirements of GTP-001 and the referenced Surveillance Test Procedure(s).

6.4.3 The Preservice Baseline Reference Values will be used as initial data to establish certain operating characteristics of each designated pump.

6.4.4 A summary of test results shall be maintained in accordance with GTP-001.

6.5 Inservice Inspection Activities (Valve Testing)

6.5.1 Only those valves which meet all of the following requirements need to be included in the ISI Program.

A. Class 1, 2 and 3 Valves and their actuation and position indicating systems

B. Needed to perform a specific function in shutting down a reactor to a cold shutdown condition

C. Needed to mitigate the consequences of an accident

6.5.2 Each valve identified in accordance with the criteria of 6.5.1 shall be tested in accordance with the requirements of GTP-002 and the referenced Surveillance Test Procedure(s).

6.5.3 The Preservice Baseline Reference Values will be used as initial data to establish certain operating characteristics of each designated valve.

6.5.4 A summary of test results shall be maintained in accordance with GTP-002.

6.6 Inservice Inspection Activities (NON DESTRUCTIVE EXAMINATION)

6.6.1 Class 1 and 2 items to be included in the ISI program shall be identified and selected by reviewing the Preservice Isometric Sketches and List of Examinations.

6.6.2 Items required to be examined by IWB-2000, and IWC-2000 shall receive the specified examination(s) as required by GTP-003 and the code.

6.6.3 The Preservice examinations will be used as data to establish baseline data for comparison to ISI examinations.

6.7 Inservice Inspection Activities (System Pressure Testing)

6.7.1 Code Class 1, 2 and 3 systems and components will be included in the ISI Program.

6.7.2 Each system, identified as Code Class 1, 2 and 3 shall be tested in accordance with the requirements of GTP-004 and the referenced Surveillance Test Procedure(s).

6.8 Inservice Inspection Activities (Component Supports)

6.8.1 Component supports to be included in the ISI program shall be identified and selected by reviewing Construction drawings and component support detail drawings.

6.8.2 Component Supports required to be examined and/or tested by IWB-2000, IWC-2000 and IWD-2000 shall receive the specified examinations and/or tests as required by GTP-005 and the referenced Surveillance Test Procedure(s).

6.9 Documentation

6.9.1 Procedures, reports, qualification and certification records and other applicable records of tests, examinations and repairs shall be prepared in accordance with the Code and the appropriate examination, test or repair procedure. Such documents shall be maintained and stored for the service lifetime of the affected component in accordance with SAP-150. These documents include but are not limited to:

A. General Test Procedures

B. Applicable Surveillance Test Procedures

C. Repair Procedures

D. NDE Written Practice

E. Material Control Procedures

F. Inservice Inspection Reports

G. NDE Procedures

H. Personnel Qualification Records

I. Testing Reports

J. NDE Reports

K. Evaluation Reports

L. Analysis Reports

M. Equipment Certification Records

N. Material Certification Records

O. Calibration Records

P. Calibration Standards

Q. Repair Records

R. Testing and Examination Summaries

S. NIS-1 Form (Attachment II)

6.9.2 Each inservice inspection report shall be completed within 90 days after the inservice inspection outage. The inservice inspection report will consist of, as a minimum, the Inservice Inspection Report Cover Sheet (Attachment I) and the NIS-1 Form.

6.9.3 Generally the NIS-1 Form will be a collection of data deemed necessary to verify the required NDE examinations have been performed in accordance with the requirements of this program. The NIS-1 Form will be four basic documents as follows:

A. Components Inspected

B. List of Examinations

C. List of Recordable Indications

D. List of Rejectable Indications

6.10 Documentation Review

6.10.1 The documentation specified in 6.9.1 and other required documentation shall be reviewed for accuracy and adequacy and placed in permanent storage in accordance with Plant Document Control Procedures.

6.10.2 During review and evaluation of test results an off-normal occurrence report shall be initiated in accordance with SAP-132 if such report has not been previously initiated.

6.11 Design Accessibility Limitations

6.11.1 Examinations or tests, as applicable, required by this procedure or its references shall be performed at the specific frequency to the extent practical as limited by design accessibility.

6.12 Relief Requests

6.12.1 Limitations of the required examinations or tests which may be identified from time-to-time will be submitted to the NRC in the form of relief request(s). Relief request(s) will specify alternate examinations or tests to be performed when such tests or examinations are meaningful.

6.13 NON CONFORMANCE NOTICES (NCNS)

6.13.1 Non-Conformance notices shall be initiated and dispositioned for unacceptable NDE results in accordance with A-NQCP-2.

6.14 Training

6.14.1 Unescorted Personnel performing examinations, repairs, tests or other Inservice Inspection Activities On-Site shall receive training and badging in accordance with SAP-108 and other applicable Station Administrative Procedures.

7.0 FIGURES

None

8.0 RECORDS

8.1 Records generated under this procedure are identified in Section 6.9.1 and 6.9.2.

INSERVICE INSPECTION REPORT

FOR

VIRGIL C. SUMMER NUCLEAR STATION (Unit #1)
P. O. Box 88
Jenkinsville, S. C. 29065

SOUTH CAROLINA ELECTRIC & GAS CO.
P. O. Box 764
Columbia, S. C. 29128

Commercial Service Date_______
Report Completion Date _______

FORM NIS-1 OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS

As required by the Provisions of the ASME Code Rules

1. Owner ______________________________
(Name and Address of Owner)

2. Plant ______________________________
(Name and Address of Plant)

3. Plant Unit _______ 4. Owner Certificate of Authorization __________
(if required)

5. Commercial Service Date ______ 6. National Board Number for Unit __________

7. Components Inspected:

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.

FORM NIS-1 (back)

8. Examination Dates ____________ to ____________

9. Inspection Interval from ____________ to ____________

10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval.

11. Abstract of Conditions Noted.

12. Abstract of Corrective Measures Recommended and Taken

We certify that the statements in this report are correct and the examinations and corrective measures taken conform to the rules of the ASME Code, Section XI.

Date ____________ 19___ Signed ____________________ By ____________________
Owner

Certificate of Authorization No. (if applicable) ____________ Expiration Date _____

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of Province of ________ ____________________ and employed by ____________________ _______ of ____________ have inspected the components described in this Owner's Data Report during the period ____________ to ____________ and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Data Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date ____________ 19____

____________________ Commissions ____________________
Inspector's Signature   National Board, State, Province and No.

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NON-CONTROLLED COPY

GENERAL TEST PROCEDURE

GTP-001

GENERAL PROCEDURE FOR INSERVICE TESTING OF PUMPS

REVISION 3

OCTOBER 6, 1982

SAFETY RELATED

Reviewed by:

Larry B. Collier 10-20-82

ORIGINATOR (of this revision) Date

M D Quinton for JKT 10-27-82

DISCIPLINE/SUPERVISOR Date

Approved:

M D Quinton 10-27-82

ASST MGR, MAINTENANCE SERVICES Date

Date Issued: OCT 29 1982

TABLE OF CONTENTS

1.0 PURPOSE

1.1 The purpose of this procedure is to define the general rules and requirements for testing of safety related ASME Code Class 1, 2, and 3 pumps which are provided with an emergency power source in accordance with subsection IWP of Reference 2.1.1.

2.0 REFERENCES AND GLOSSARY

2.1 References

2.1.1 ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition through Summer 1978 addenda.

2.1.2 Virgil C. Summer Nuclear Station Technical Specifications

2.1.3 Control Of Station Surveillance Test Activities, SAP-134

2.1.4 Development, Review, and Approval of Procedures, Revisions, Changes, SAP-139

2.1.5 Inservice Inspection Program, SAP-144

2.1.6 Control and Calibration of Measuring and Test Equipment, SAP-141

2.1.7 Preservice Inspection Program, AP-014

2.2 Glossary

2.2.1 ANII - Authorized Nuclear Inservice Inspector

2.2.2 AP - Administrative Procedure

2.2.3 CHAMPS - Comprehensive Handling and Maintenance Program System

2.2.4 GTP - General Test Procedure

2.2.5 ISI - Inservice Inspection

2.2.6 SOP - System Operating Procedure

2.2.7 STP - Surveillance Test Procedure

2.2.8 STTS - Surveillance Test Task Sheet

2.2.9 Symbols - the various symbols used in this procedure to define pump parameters are listed on Attachment II.

3.0 RESPONSIBILITIES

3.1 The responsibilities for implementation of this procedure are delineated and described in SAP-145.

4.0 GENERAL

NOTES: 1) Attachment I to this procedure lists those pumps which are included in the scope of the Inservice Inspection Program. The list was developed in accordance with Reference 2.1.1 with guidance from Branch Technical Position M.E.B. No. 2.

2) The detailed steps necessary for the Inservice testing of these pumps are outlined in separate Surveillance Test Procedures. Attachment I lists the Surveillance Test Procedures that are applicable for each type of pump.

3) The performance of Inservice Testing per Reference 2.1.1 shall be in addition to any other specified surveillance requirements.

4) Nothing contained in Reference 2.1.1 shall be construed to supersede the requirements of any Technical Specification.

4.1 Components

4.1.1 All pumps which are required to be tested in the ISI Program are listed on Attachment I.

4.2 Reference Values

4.2.1 Reference values will be used as a basis of comparison for all subsequent testing. Deviations from these reference values are indicative of changes which, depending upon the degree of deviation, may indicate a need for corrective action or further tests. (Refer to Section 6.0 of this procedure.)

4.2.2 Reference values shall be obtained during the Preservice Inspection Program (PSI) at points of operation easily duplicated during power operation or separate baseline reference established utilizing Surveillance Test Procedures.

4.2.3 The reference values shall be clearly marked and filed as part of the pump record. If new reference values are established in accordance with subsections IWP-3111 and IWP-3112 of Reference 2.1.1, the new reference values should be clearly marked and the previous reference values retained as part of the pump record. If new reference values are established, the reason for doing so shall be justified and documented in the pump file.

4.3 Scope of Tests

4.3.1 Each ISI test shall include measurement or observation of all quantities specified on the Pump Data Sheet, except bearing temperatures which shall be recorded at least once per year during ISI testing.

4.3.2 When bearing temperature measurement is not required each pump shall be run for at least 5 minutes. At the end of that period at least one measurement or observation of the quantities specified in the STP shall be made and recorded on the Pump Data Sheets provided in the procedure which directs the test.

4.3.3 When measuring bearing temperature, run the pump until the bearing temperature stabilizes. Bearing temperature shall be considered stable when three successive readings taken at 10 minute intervals do not vary by more than 3%. After bearing temperature stabilization, the quantities specified on the Surveillance Test Procedure shall be measured or observed and recorded on the data sheets provided in the procedure which directs the test.

4.4 Frequency

4.4.1 All Quantities specified in the applicable Surveillance Test Procedure, except bearing temperature, shall be measured or observed and recorded for each pump every 31 days during normal plant operation.

NOTE: It is recommended that the above test frequency be maintained, if possible, during plant shutdown to minimize accumulation of required tests. If the tests are not conducted during plant shutdown the pump shall be tested within one week after the plant is returned to normal operation.

NOTE: The test frequency may be increased as a result of deviations in test quantities in comparison to reference values. Refer to Section 6.0 of this procedure for details.

4.4.2 Pumps which are normally operated more frequently than every month may be tested during normal operation provided the Pump Data Sheets and the Pump File show each such pump was operated at the reference values in the required flow path and the required quantities specified in the STP were measured, observed, analyzed and recorded on the applicable Pump Data Sheets.

4.4.3 Bearing temperature shall be measured and recorded at least once per year for each pump during an ISI test on that pump.

4.4.4 Each pump's Inservice test shall be performed at the specified time interval with:

A. A maximum allowable extension not to exceed 25% of the Surveillance Interval.

B. A total maximum combined interval for any three (3) consecutive surveillance intervals is not to exceed 3.25 times the specified surveillance interval.

NOTE: Refer to the applicable Surveillance Test Procedure for the required parameters to be measured.

4.5 Measurement Methods

4.5.1 All instruments used for Inservice Tests may have nominal errors within the following limits and the range of each instrument shall not exceed three (3) times the reference value.

NOMINAL MAXIMUM INSTRUMENT ERRORS

Pressure	± 2% of Full Scale
Differential Pressure	± 2% of Full Scale
Flowrate	+ 2% of Full Scale
Speed	± 2% of Full Scale
Temperature	± 5% of Full Scale
Vibration Amplitude	± 5% of Full Scale

NOTE: V. C. Summer calibrated Field Test Equipment and/or Process Instruments satisfy these accuracy requirements.

4.5.2 All instruments (together with their transmitters, if required) used in measuring the inservice test quantities listed in the STP during Inservice testing shall be calibrated in accordance with reference 2.1.6, SAP-141, "Control and Calibration of Measuring and Test Equipment".

4.5.3 Instruments, in which the readings are position sensitive, i.e., vibration amplitude, shall be permanently mounted or provisions will be made in the Preoperational/Functional testing procedures and the STPs to duplicate position for each test.

4.5.4 Symmetrical damping devices or averaging techniques may be used to reduce instrument fluctuations to within ± 2% of the observed reading. Hydraulic readings may be damped by using gage snubbers or by throttling small valves in instrument lines. If throttling of small valves is used, the operator should alternately open and close the valve several times to verify unobstructed pressure communication, while observing the instrument reading.

4.5.5 The following instructions refer to pressure measurement during the test as outlined in subsection IWP-4200 of Reference 2.1.1.

A. Gage Lines: If a gage line is such that the presence or absence of liquid could produce a difference of more than 1/4% in the indicated value of the measured pressure, means shall be provided in the STP to assure or determine the presence or absence of liquid as required for the static correction used.

B. Pressure Taps: Pressure taps shall be located in a section of the flow path that is expected to have reasonably stable flow as close as practical to the pump. Any line valves between inlet and discharge pressure taps shall be in a fully open position during the test.

C. Differential Pressure: The differential pressure across a pump shall be determined by use of either a differential pressure gage or differential pressure transmitter that provides direct measurement of pressure difference, or by taking the difference between the pressure at a point in the inlet pipe, and the pressure at a point in the discharge pipe.

4.5.6 The following instructions refer to temperature measurement during the test as outlined in Subsection IWP-4300 of Reference 2.1.1.

A. Bearing Temperature: The temperature of all centrifugal pump bearings outside the main flow path shall be measured at points selected to be responsive to changes in the temperature of the bearing. These points will be used for subsequent measurements. Lubricant temperature, when measured prior to a cooler, shall be considered the bearing temperature.

B. Alternately, a contact pyrometer on the pump bearing housing may be used. When using a contact pyrometer on the bearing housing the location at which the reference value is established will be used for subsequent measurements.

4.5.7 The following instructions refer to vibration measurement during the test as outlined in Subsection IWP-4500 of Reference 2.1.1.

A. At least one displacement vibration amplitude (peak-to-peak composite) shall be read during each inservice test. The direction of displacement shall be measured in a plane approximately perpendicular to the rotating shaft, and in the horizontal or vertical direction that has the largest deflection for the particular pump installation.

B. The location shall generally be on a bearing housing, or its structural support, provided it is not separated from the pump by any resilient mounting. On a pump coupled to the driver, the measurement shall be taken on the bearing housing near the pump coupling, the measurement point shall be as close as possible to the inboard bearing.

4.5.8 The following instructions refer to Flow Measurement during the test as outlined in Subsection IWP-4600 of Reference 2.1.1.

A. Flow rate shall be measured using a rate or quantity meter installed in the pump test circuit. The meter may be in any class that provides an overall readout repeatability within the accuracy limits of 4.5.1.

B. Where the meter does not indicate the flow rate directly, the record shall include the method to reduce the data.

5.0 RECORDS

5.1 A file will be maintained for each pump covered by this ISI Program. The file will include the following items and must be retained for the lifetime of the component.

5.1.1 A Pump Data Sheet listing reference values.

NOTE: If a new set of reference values are established as permitted by Subsection IWP-3111 and IWP-3112 of Reference 2.1.1, the file will contain documentation of the reasons for establishing additional set of reference values. In addition, the previous reference values may be maintained to indicate they have been superseded or maintained as a separate set of reference values.

5.1.2 Pump Data Sheets for each test which has been performed.

5.1.3 The name of the pump manufacturer, manufacturer's serial number, manufacturer's model number and the equipment identification number.

5.1.4 A copy of the Manufacturer's Acceptance Test, if any, or a summary thereof.

5.1.5 A copy of the ISI Pump Data Sheet Acceptance Criteria and a record of corrective action, if applicable, for each test which has been performed.

5.1.6 Any additional data which would enhance the ability of plant personnel to analyze trends and assess operational readiness.

5.2 When using flow meter(s) to measure flow in inches of H_2O the following formula may be used to calculate flow in gallons per minute where:

Q = Flow (gallons per minute)
X = Constant for type and size of orifice and system resistance
Y = Flow in inches of water

$$Q = X\sqrt{Y}$$

5.3 Relief requests, if any, shall be referenced on Attachment I. Such relief requests shall be indexed, stored and maintained under separate cover.

6.0 RESULTS

6.1 All test data must be analyzed within 96 hours of test completion; however, weekends and/or holidays are not included in this time frame. (Reference Relief Request E.1)

6.2 The Acceptable, Alert, and Required Action Ranges of ISI test quantities are tabulated on Attachment III. The ranges are expressed as a percentage of the reference values. If the ISI Test Quantities deviate from the Acceptable Range, the following corrective action statements shall be observed:

6.2.1 If the ISI Test Quantities fall within the Alert Range as shown on Attachment III, the frequency of testing shall be doubled until the cause of deviation is determined and corrected and either the existing reference values reverified or a new set established in accordance with Subsections, IWP-3111 and IWP-3112 of Reference 2.1.1.

6.2.2 If the ISI Test Quantities fall within the Required Action Range of Attachment III:

A. The pump shall be declared inoperative.

B. The pump shall not be returned to service until the condition has been corrected and a satisfactory ISI test has been conducted or engineering evaluation has been performed to permit operability of the pump.

6.3 The Shift Supervisor will review the test data immediately upon completion of the test and compare it to the acceptable ranges as shown on Attachment III. If the results are unsatisfactory, he shall initiate corrective action, including any Limiting Condition for Operations, as required by V. C. Summer Technical Specification.

NOTE: The Limiting Condition for Operation will be referenced in the STP for those pumps whose inoperability require a Limiting Condition for Operation.

6.4 A summary, Attachment IV, will be maintained indicating the "Date of Successful Test" for each pump.

7.0 ATTACHMENTS

7.1 Attachment I - Pump List

7.2 Attachment II - Symbols

7.3 Attachment III- Allowable Ranges of ISI Test Quantities.

7.4 Attachment IV - Pump Test Summary

TEST LIST

STP-120.001 - Emergency Feedwater Pump (Electric) Test

STP-120.002 - Emergency Feedwater Pump (Turbine) Test

STP-123.002 - Service Water Pump Test

STP-125.002 - Diesel Generator Operability Test

STP-122.002 - Component Cooling Water Pump Test

STP-105.004 - RHR Pump Test

STP-129.001 - Chilled Water Pump Test

STP-104.005 - Boric Acid Transfer Pump Test

STP-112.002 - RB Spray Pump Test

STP-105.001 - Charging/Safety Injection Pump Test

SYMBOLS

SYMBOLS	QUANTITIES	UNITS	UNIT ABBREVIATION
M, 1	Exponents	—	—
P	Differential Pressure across Pump	Pounds per square inch	psi
P_i	Inlet Pressure	Pounds per square inch gage	psig
Pd	Discharge Pressure	Pounds per square inch gage	psig
Q	Flow Rate	Gallons per minute	gpm
r	Subscript denotes reference quantity		
N	Rotative Speed	Revolutions per minute	
T_b	Bearing Temp.	Deg. Fahrenheit	°F
T_p	Fluid Temp.	Deg. Fahrenheit	°F
V	Vibration amplitude (Peak-to-Peak)	Thousandths of an inch	mil
>	Greater Than	—	—
<	Less Than	—	—
$\geq$	Greater Than or Equal to	—	—
$\leq$	Less Than or Equal to	—	—

ALLOWABLE RANGES OF ISI TEST QUANTITIES

Test Quantity	Acceptable Range	CORRECTIVE ACTION: Alert Range[3] Low Values	Alert Range[3] High Values	Required Action Range[3] Low Values	Required Action Range[3] High Values
Pi	Note 1	Note 1	Note 1	Note 1	Note 1
P (Pd-Pi)	(.93 to 1.02) Pr	(.90 to .93) Pr	(1.02 to 1.03) Pr	<.90 Pr	>1.03 Pr
Q	(.94 to 1.02)Qr	(.90 to .94)Qr	(1.02 to 1.03)Qr	<.90 Qr	>1.03 Qr
V When 0 ≤ Vr ≤ 0.5 mil	0 to 1 mil	none	1 < V ≤ 1.5 mil	none	V >1.5 mil
V When 0.5 mil < Vr ≤ 2.0 mil	V(0 to 2)Vr mil	none	2 Vr mil to 3 Vr mil	none	> 3Vr mil
V When 2.0 mil < Vr ≤ 5.0 mil	0 to (2+Vr) mil	none	(2+Vr) mil to (4+Vr) mil	none	> (4+Vr) mil
V When Vr > 5.0 mil	(0 to 1.4)Vr mil	none	1.4 Vr mil to 1.8 Vr mil	none	> 1.8 Vr mil
Tb	Note 2	Note 2	Note 2	Note 2	Note 2

NOTES:

1) P_i - The pump inlet pressure will be determined during the PSI portion of this program.

2) T_b - The bearing temperature will be determined during the PSI portion of this program.

3) Refer to Section 6.0 of this procedure.

PUMP TEST SUMMARY

	DATE OF SUCCESSFUL TEST											
PUMP NO.	INITIAL	DATE	INITIAL	DATE	INITIAL	DATE	INITIAL	DATE	INITIAL	DATE	INITIAL	DATE

PUMP NUMBER #	SYSTEM	PUMP DESCRIPTION	DRAWING NUMBER	CO-ORD	RELIEF REQUEST	REMARKS
XPP-21A	EF	MOTOR DRIVEN EMERGENCY FEED WATER PUMP	302-085	D-7	NO	STP-120.001*
XPP-21B	EF	MOTOR DRIVEN EMERGENCY FEED WATER PUMP	302-085	F-6	NO	STP-120.001*
XPP-8	EF	TURBINE DRIVEN EMERGENCY FEED WATER PUMP	302-085	H-6	NO	STP-120.002*
XPP-39A	SW	SERVICE WATER PUMP	302-221	C-2	NO	STP-123.002*
XPP-39B	SW	SERVICE WATER PUMP	302-221	C-10	NO	STP-123.002*
XPP-39C	SW	SERVICE WATER PUMP	302-221	C-6	NO	STP-123.002*
XPP-45A	SW	SERVICE WATER BOOSTER PUMP	302-222	C-6	YES B.1	STP-123.002*
XPP-45B	SW	SERVICE WATER BOOSTER PUMP	302-222	G-6	YES B.1	STP-123.002*
XPP-141A	DG	DIESEL GENERATOR FUEL OIL TRANSFER PUMP	302-351	G-14	YES A.1	STP-125.002*
XPP-141B	DG	DIESEL GENERATOR FUEL OIL TRANSFER PUMP	302-351	G-2	YES A.1	STP-125.002*
XPP-4A	DG	DIESEL GENERATOR FUEL OIL TRANSFER PUMP	302-351	G-12	YES A.1	STP-125.002*

PUMP NUMBER	SYSTEM	PUMP DESCRIPTION	DRAWING NUMBER	CO-ORD	RELIEF REQUEST	REMARKS
XPP-4B	DG	DIESEL GENERATOR FUEL OIL TRANSFER PUMP	302-351	G-3	YES A-1	STP-125.002*
XPP-1A	CC	A COMPONENT COOLING WATER PUMP	302-611	G-8	NO	STP-122.002*
XPP-1B	CC	B COMPONENT COOLING WATER PUMP	302-611	G-4	NO	STP-122.002*
XPP-1C	CC	C COMPONENT COOLING WATER PUMP	302-611	H-6	NO	STP-122.002*
XPP-31A	RH	A RESIDUAL HEAT REMOVAL PUMP	114E074	C-7	NO	STP-105.004*
XPP-31B	RH	B RESIDUAL HEAT REMOVAL PUMP	114E074	E-7	NO	STP-105.004*
XPP-48A	VU	HVAC SYSTEM A CHILLED WATER PUMP	302-841	E-10	NO	STP-129.001*
XPP-48B	VU	HVAC SYSTEM B CHILLED WATER PUMP	302-841	E-5	NO	STP-129.001*
XPP-48C	VU	HVAC SYSTEM C CHILLED WATER PUMP	302-841	E-5	NO	STP-129.001*
XPP-13A	BR	A BORIC ACID TRANSFER PUMP	114E073, SH 5	E-8	YES C.1	STP-104.005*
XPP-13B	BR	B BORIC ACID TRANSFER PUMP	114E073, SH 5	C-8	YES C.1	STP-104.005*

PUMP NUMBER	SYSTEM	PUMP DESCRIPTION	DRAWING NUMBER	CO-ORD	RELIEF REQUEST	REMARKS
XPP-38A	SP	A REACTOR BUILDING SPRAY PUMP	302-661	D-6	NO	•STP-112.002*
XPP-38B	SP	B REACTOR BUILDING SPRAY PUMP	302-661	E-6	NO	STP-112.002*
XPP-43A	CS	A CHARGING AND SAFETY INJECTION PUMP	114E073 SH 3	E-8	YES D.1	STP-105.001*
XPP-43B	CS	B CHARGING AND SAFETY INJECTION PUMP	114E073 SH 3	C-8	YES D.1	STP-105.001*
XPP-43C	CS	C CHARGING AND SAFETY INJECTION PUMP	114E073 SH 3	D-8	YES D.1	STP-105.001*
						*See attached Test List (page 4 of 5)

RELIEF REQUEST E.1 APPLIES TO ALL PUMPS IN THIS ATTACHMENT.

PUMP TEST RELIEF INDEX

NON-CONTROLLED COPY

PUMP TEST RELIEF REQUESTS

A.1	Pump(s):	XPP-141A, XPP-141B, XPP-4A, XPP-4B
	Class:	3
	Function:	Diesel Fuel Oil Transfer Pumps

Test Requirement: Each Inservice Test shall include measurement and/or observation of the following quantities: Inlet Pressure (Pi), Differential Pressure (Δ P), Flow Rate (Q), Vibration Amplitude (V), Lubricant Level and Bearing Temperature (Tb).

Relief Request: Relief is requested from ASME Code Section XI Requirements for measuring everything except flow.

Basis For Relief: These pumps are positive displacement with self lubricated internal bearings. Therefore, flow measurement is indicative of pump performance.

Alternate Test: Flow measurement will be taken when pumps are used to pump up the Diesel Fuel Oil Tank at least once each month.

PUMP TEST RELIEF REQUESTS

B.1 Pump(s): XPP-45A, XPP-45B

Class: 3

Function: Service Water Booster Pumps

Test Requirement: Each Inservice Test shall include measurement and/or observation of the following quantities: Inlet Pressure (Pi), Differential Pressure (DP), Flow Rate (Q), Vibration Amplitude (V), Lubricant Level or Pressure and Bearing Temperature (Tb).

Relief Request: Relief is requested from ASME Code Section XI Requirements for measuring flow.

Basis For Relief: Full Flow Test would be detrimental to water chemistry the Reactor Building cooling units. The installed flow element/transmitter is downstream of the recirculation line and would not be representative of total pump flow when pump is tested by recirculation flow.

Alternate Test: Pumps will be tested on recirculation, measuring pump P utilizing pump suction and discharge pressure instrumentation. Pump P is indicative of pump performance which satisfies the intent of ASME Code Section XI.

C.1 Pump(s):	XPP-13A, XPP-13B
Class:	2
Function:	Boric Acid Transfer Pumps
Test Requirement:	Each Inservice Test shall include measurement and/or observation of the following quantities: Inlet Pressure (Pi), Differential Pressure (ΔP), Flow Rate (Q), Vibration Amplitude (V), Lubricant Level or Pressure and Bearing Temperature (Tb).
Relief Request:	Relief is requested from ASME Code Section XI Requirements for measuring flow and vibration.
Basis For Flow Relief	There is no installed flow element in the system.
Alternate Test For Flow:	Pumps will be tested by recirculating to their associated tank and measuring pump ΔP utilizing tank level as suction pressure
Basis For Vibration Relief:	These pumps are canned motor/pump units which have water lubricated sleeve bearings. Representative vibration indication cannot be obtained on the pump casing due to the damping effect of the water.
Alternate Test For Vibration:	Each pump will be disassembled annually and inspected for abnormal wear or degradation in accordance with Mechanical Maintenance Procedures.

PUMP TEST RELIEF REQUESTS

D.1	Pump(s):	XPP-43A, XPP-43B, XPP-43C
	Class:	2
	Function:	Charging/Safety Injection Pumps
Test Requirement:		Each Inservice Test shall include measurement and/or observation of the following quantities: Inlet Pressure (Pi), Differential Pressure (ΔP), Flow Rate (Q), Vibration Amplitude (V), Lubricant Level or Pressure and Bearing Temperature (Tb).
Relief Request:		Relief is requested from ASME Code Section XI Requirements for measuring flow.
Basis For Relief:		The installed Flow Element/Transmitter is downstream of the seal injection and would not be representative of total pump flow.
Alternate Test:		Technical Specification 4.1.2.3.1 "Required Charging Pump shall be demonstrated operable by verifying, on recirculation flow, a differential pressure across the pump of greater than or equal to 2472 PSIG is developed. This test is required to be performed at least once per 31 days except when the vessel head is removed, thus is indicative of pump performance and satisfies the intent of ASME Code Section XI Flow Test.

PUMP TEST RELIEF REQUESTS

E.1	Pump(s):	All identified in the Inservice Inspection Program (GTP-001)
	Class:	1, 2 and 3
	Function:	Defined by GTP-001
Requirements:		To review test data within 96 hours from the time test was performed.
Relief Request:		To exclude weekends and/or holidays from the 96 hour time frame starting at 4:00 P.M. on day preceding and ending at 8:00 A.M. on the day following the weekend and/or holiday, as applicable.
Alternate Requirements:		Review test data within 3 working days following the weekend and/or holiday not to exceed 96 hours accumulated time excluding weekends and/or holidays.

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

GENERAL TEST PROCEDURE

GTP-002

GENERAL PROCEDURE FOR INSERVICE TESTING OF VALVES

REVISION 4

SEPTEMBER 11, 1982

NON-CONTROLLED COPY

SAFETY RELATED

Reviewed by:

Larry B. Collier — 10-18-82
ORIGINATOR (of this revision) — Date

Larry B. Collier — 10-18-82
DISCIPLINE SUPERVISOR — Date

Approved:

M D Quinton — 10-27-82
ASST.MGR.MAINTENANCE SERVICES — Date

Date Issued: OCT 29 1982

LIST OF EFFECTIVE PAGES

PAGE	REVISION
i	4
ii	4
1	4
2	4
3	4
4	4
5	4
6	4
7	4
8	4
9	4
10	4
11	4
12	4
13	4
14	4
15	4

ATTACHMENTS

Attachment I, Pages 1 through 69	4
Attachment II	4
Attachment III	4
Attachment IV, Pages 1 and 2	4
Attachment V, Pages 1 and 2	4

TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure defines the general rules and requirements for testing of ASME Code Class 1, 2 and 3 valves in accordance with subsection IWV of reference 2.1.1 and provides for the scheduling of the Inservice Testing of those valves. In addition, this procedure provides the interface between the Preservice Inspection Program for valves which are the responsibility of the SCE&G Start-Up personnel and the Inservice Inspection Program which is the responsibility of SCE&G Nuclear Operations personnel.

1.2 Attachment I to this procedure lists those valves included in the scope of the Inservice Inspection program. The valve list was developed, with guidance from Branch Technical Position MEB No. 2, "Pump and Valve Operability Assurance Program, utilizing the following criteria:

> "Valves that are required to perform a specific function in shutting down the reactor to the cold shutdown condition or in mitigating the consequences of an Accident".

1.3 The detailed steps necessary for preservice testing of these valves are outlined in separate Preoperational/Functional Test Procedures.

1.4 The detailed steps necessary for the Inservice testing of these valves are outlined in separate Surveillance Test Procedures. Attachment IV to this procedure lists the Surveillance Test Procedures that are applicable for each valve.

1.5 The performance of Inservice Testing in accordance with Reference 2.1.1 shall be in addition to any other specified surveillance requirements.

1.6 Nothing contained in Reference 2.1.1 shall be construed to supersede the requirements of any Technical Specification.

2.0 REFERENCES AND GLOSSARY

2.1 References

2.1.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1977 Edition, Summer 1978 Addenda, Subsection IWV.

2.1.2 V. C. Summer Technical Specifications

2.1.3 SAP-139 Development, Revision and Approval of Procedures

2.1.4 SAP-145, Inservice Inspection Program

2.1.5 SAP-134 Control of Station Surveillance Test Activities

2.1.6 SAP-141, Control and Calibration of Measuring and Test Equipment

2.1.7 PTC 25.3 1976 - Power Test Codes, "Safety and Relief Valves with Atmospheric or Superimposed Backpressure Before Charging"

2.1.8 V. C. Summer Operational Quality Assurance Plan

2.1.9 V. C. Summer Final Safety Analysis Report

2.1.10 10 CFR 50.55a(g)

2.1.11 Branch Technical Position MEB No. 2, "Pump and Valve Operability Assurance Program"

2.2 Glossary

2.2.1 STP - Surveillance Test Procedure

2.2.2 AP - Administrative Procedure

2.2.3 GTP - General Test Procedure

2.2.4 PSI - Preservice Inspection - Preservice Inspection as used in this procedure refers to the establishment of reference values by conducting a Preservice Inspection test prior to service. The Preservice Inspection is conducted through the use of Preoperational/Functional tests.

2.2.5 ISI - Inservice Inspection - Inservice Inspection as used in this procedure refers to a special valve test whose results may be compared to previously established reference values to assess the operational readiness of a valve. The Inservice Inspection is conducted through the use of Surveillance Test Procedures.

Code - As used in this procedure, shall refer to ASME Code, Section XI, 1977 Edition, Summer 1978 Addenda, unless otherwise specified.

2.2.6 LCO - Limiting Condition for Operation

2.2.7 Categories of valves subject to the rules of this procedure are defined in accordance with reference 2.1.1 as follows:

A. Category A - valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their function.

B. Category B - valves for which seat leakage in the closed position is inconsequential for fulfillment of their function.

C. Category C - valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves).

D. Category D - valves which are actuated by an energy source capable of only one operation, i.e., Rupture Disks or Explosive-Actuated Valves.

NOTE: Combination of categories, such as categories A/C are to be used when more than one distinguishing category characteristic is applicable. In such cases, all requirements of each of the individual categories are applicable, although duplication or repetition of common testing requirements are not necessary.

2.2.8 "CHAMPS" - Comprehensive Handling and Maintenance Program System; i.e., Periodic Task Scheduling

2.2.9 ISI Coordinator - SCE&G Nuclear Operations Assistant Manager Maintenance Services or his designee will fill this position.

2.2.10 FS - Excercise valves (full stroke) for operability every three (3) months measuring time of stroke and comparing it to the previous measured time.

2.2.11 LT - Valves are leak tested at each refueling outage per Appendix J to 10 CFR50.55a.

2.2.12 CV - Exercise check valves to the position required to fulfill their function every three (3) months.

2.2.13 SRV - Safety and Relief valves are tested per Section XI Article IWV-3510.

2.2.14 CS - Excercise valves (full stroke) for operability every cold shutdown measuring time of stroke and comparing it to the previous measured time.

2.2.15 RS - Exercise valve (full stroke) for operability every refueling shutdown measuring time of stroke and comparing it to the previous measured time.

2.2.16 ANII - Authorized Nuclear Inservice Inspector

2.2.17 LOCA - Loss of Coolant Accident

3.0 RESPONSIBILITIES

3.1 The responsibilities for implementation of this procedure are delineated and described in SAP-145.

4.0 GENERAL

4.1 Components

4.1.1 All valves which require inservice testing are listed on Attachment I. The guidelines of Branch Technical Position MEB No. 2, "Pump and Valve Operability Assurance Program" was used in developing this list.

4.1.2 Valve categories are listed on Attachment I. Valve categorization has been performed in accordance with subsection IWV-2100 of the Code.

4.2 Preservice Examination

4.2.1 Each valve listed on Attachment I shall be given a Preservice Test, as required by subsection IWV of the Code, after installation and prior to entering service. This test will constitute the Preservice test required by subsection IWV-3100 of the Code.

4.2.2 The preservice examination shall be conducted in accordance with approved Preoperational/Functional test procedures.

4.3 Valve Replacement/Repair and Maintenance

4.3.1 After a valve or its control system has either been replaced, repaired, or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested as necessary to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits.

EXAMPLE: Adjustment of stem packing; removal of the bonnet, stem assembly, or actuator; or disconnection of hydraulic or electrical lines are examples of maintenance that could affect valve performance parameters.

4.4 Inservice Testing Requirements

4.4.1 Category A & B Active Valves Exercising Test Frequency

A. Category A & B valves shall be exercised at least once every 3 months with exceptions as noted in Section 4.4.2A and 4.4.2B.

B. Category A & B valves in regular use which operate at a frequency which would satisfy the exercising requirements noted above need not be additionally excercised provided that the required observations are made, analyzed and recorded at the specified intervals.

C. If Category A & B valves are located in a system which is out of service exercising is not required for such valves except immediately prior to returning the system to service.

NOTE: During plant shutdown Inservice test frequencies should be maintained where possible to minimize the number of tests required prior to returning to normal operation.

4.4.2 Category A & B Valves Exercising Procedure Scope

A. Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the valve shall be part-stroke exercised during plant operation and full-stroked during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months. Normally closed valves that cannot be exercised during normal plant operation are identified on Attachment I and shall be exercised during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months.

B. Fail-Safe Valves. Where practical valves with fail-safe actuators shall be tested by observing the operation of the valves upon loss of actuator power. When these valves cannot be tested once every 3 months they shall be tested during each cold shutdown; in case of frequent cold shutdowns, these valves need not be tested more often than once every 3 months.

C. The necessary valve stem or disk movement shall be established by exercising the valve while observing either an appropriate indicator which signals the required change of valve stem or disk position, or indirect evidence, such as changes in system pressure, flow rate or temperature which reflect stem or disk position.

D. The following requirements apply to Category A & B Power Operated Valves.

1. The limiting value of full stroke time of each power operated valve is listed on Attachment I.

2. The stroke time of all power-operated valves shall be measured to the nearest second or within 10% of the maximum allowable stroke time, whichever is less, whenever such a valve is full-stroke tested.

3. Stop watches or other appropriate timing devices shall be used when timing power operated valves.

4. Panel light indicators shall be used when verifying motor operated, air operated and valves with fail-safe actuators.

NOTE: At least once every two years, remote indication will be checked to verify that remote valve indications accurately reflect valve operation for valves which are inaccessible for direct observation during plant operation.

4.4.3 Category A Valve Leak Test Frequency

A. Category A valves shall be leak tested at the same or greater frequency as scheduled refueling outages but not less than once every two years.

4.4.4 Category A Valve Leak Test Procedure Scope

A. The Category A Valve seat leakage tests shall be made with the pressure differential in the same direction as will be applied when the valve is performing its function with the following exceptions:

1. Any globe type valve may be tested with pressure under seat.

2. Butterfly valves may be tested in either direction, provided their seat construction is designed for sealing against pressure on either side.

3. Gate valves with two-piece disks may be tested by pressurizing such valves between the seats.

4. All valves (except check valves) may be tested in either direction if the function differential pressure is 15 psi or less.

5. The use of leakage tests involving pressure differentials lower than function pressure differentials are permitted in those types of valves in which service pressure will tend to diminish the overall leakage channel opening, as by pressing the disk into or onto the seat with greater force. Gate valves, check valves, and globe type valves having function pressure differential applied over the seat, are examples of valve applications satisfying this requirement. When leakage tests are made in such pressures lower than function maximum pressure differential, the observed leakage shall be adjusted to function maximum pressure differential value by calculation appropriate to the test media and the ratio between test and function pressure differential assuming leakage to be directly proportional to the pressure differential to the one-half power.

6. Any valves not qualifying for reduced pressure testing as defined above shall be leak tested at full maximum function pressure differential, with adjustment by calculation if needed to compensate for a difference between service and test media.

7. Valves which function in the course of plant operation in a manner that demonstrates functionally adequate seat tightness need not be leak tested. In such cases, the valve record shall provide the basis for the conclusion that operational observation constitutes satisfactory demonstration.

B. Category A valve seat leakage may be determined by:

   1. Draining the line, closing the valve and pressurizing the valve to be tested as outlined in Section 4.4.4.A and measuring leakage through a downstream telltale connection.

   2. Measuring the feed rate required to maintain pressure between two valves, or between two seats of a gate valve, provided the total apparent leak rate is charged to the valve or gate valve seat being tested, and that the conditions required above are satisfied.

C. The detailed steps necessary to check seat leakage will be outlined in the STP or Preoperational/ Functional Test Procedure directing the test.

D. The test medium shall be specified in the STP or Preoperational/Functional Test Procedure directing the test.

E. The leakage limits associated with valve seat leakage are listed on Attachment V. These limits are established based on the following:

   1. For penetration/containment Isolation Valves there are three limits (1) suggested limit so as not to exceed the .6 La limit, as specified in Appendix J, (2) an alert limit to identify those valves which might become a problem, and (3) the maximum limit when repairs or replacement should occur except as may be otherwise approved by Nuclear Engineering.

   2. Technical Specifications 3.4.6.2f - 1 GPM leakage at a Reactor Coolant System Pressure Isolation Valve specified on Attachment V, Page 2 of 3, when RCS pressure is at 2235 ± 20 psig.

4.4.5 Category C Valves Test Frequency

A. Safety/Relief valves shall be tested at the end of each time period as defined on Attachment I.

B. Check valves shall be exercised every 3 months subject to the exceptions listed in section 4.4.6.B of this procedure.

4.4.6 Category C Valves Test Procedure Scope

A. Safety Valve and relief valve set points shall be tested in accordance with reference 2.1.7.

B. Check valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the check valve shall be part-stroke exercised during plant operation and full-stroked during each cold shutdown. In case of frequent cold shutdowns these check valves need not be exercised more often than once every 3 months. Normally closed check valves that cannot be operated during normal plant operation are identified on Attachment I and shall be exercised during each cold shutdown. In case of frequent cold shutdowns these check valves need not be exercised more often than once every 3 months. The following section delineates the general methods to be used in testing either a normally open or normally closed check valve.

1. Check valves which are normally open during plant operation whose function is to prevent reversed flow, shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means.

2. Check valves which are normally closed during plant operation, whose function is to open on reversal of pressure differential, shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated, or a mechanical opening force is applied to the disk. Confirmation that the disk moves away from the seat shall be by visual observation, by electrical signal initiated by a position indicating device, by observation of substantially free flow through the valve as indicated by appropriate pressure indications in the system, or by other positive means.

   This test may be with or without flow through the valve. If it is made without flow through the valve, a mechanical exerciser shall be used to move the disk. The force or torque delivered to the disk by the exerciser must be limited to no more than 10% of the equivalent force or torque represented by the minimum emergency condition pressure differential acting on the disk, or 200% of the actual observed force or torque required to perform the exercise on the valve when the valve is new and in good operating condition, whichever is less.

   The disk movement shall be sufficient to prove that the disk moves freely off the seat. For swing or tilting disk type valves, if the test is made by use of fluid flow through the valve, the pressure differential for equivalent flow shall be no greater than that observed during the preservice test. For other types of check valves, it shall be shown that disk movement is sufficient to provide a flow area of no less than 50% of the area of the seat port, or to permit flow adequate for the function of the valve.

4.5 Those valves required to be tested during Cold Shutdown will commence within 48 hours of achieving Cold Shutdown and continue until Startup or until testing is complete, whichever occurs first.

5.0 RECORDS

5.1 A file will be maintained for each group of valves covered by the ISI Program. The file will include the following:

5.1.1 Valve Test Summary (Attachment III).

5.1.2 Records of results from ISI tests that have been conducted on a valve.

5.1.3 Any additional data which would enhance the ability of plant personnel to analyze trends and assess operational readiness.

5.2 Relief requests, if any, shall be referenced on Attachment I. Such relief requests shall be indexed, stored and maintained under separate cover.

6.0 RESULTS

6.1 The results of Inservice Valve Tests shall be analyzed to assess the operational readiness of each valve.

6.2 The following points shall be observed when analyzing the results of the power operated Category A & B valve exercising test.

6.2.1 If any power operated Category A & B valve shows an increase in the stroke time of 25% or more from the previous test for valves with stroke times greater than ten seconds or 50% or more for valves with stroke times less than or equal to ten seconds, the test frequency shall be increased to once each month until corrective action is taken, at which time the original test frequency shall be resumed. In any case any abnormality or erratic action shall be reported.

6.2.2 If a power operated valve fails to exhibit the required change of valve stem or disk position by this testing, corrective action shall be initiated immediately. If the condition is not, or can not be corrected within 24 hours, the valve shall be declared inoperative. (The STP directing the test will outline any LCO's which apply.)

6.2.3 When corrective action is required as a result of the inservice tests made during cold shutdown, the condition shall be corrected before startup. A retest showing acceptable operation shall be run following any required corrective action before the valve is returned to service.

6.3 When analyzing the results of the Category A valve leakage tests the current test data shall be compared with the previous test data as well as with the maximum permissible leakage rate specified in the STP directing the test. If no specific permissible leakage rates have been established the values shown on Attachment V shall be used in evaluating test results. The following corrective action shall be observed if any Category A valve fails to satisfy the acceptance criteria of the STP on Preoperational/Functional Test directing the test.

6.3.1 Valves with leakage rates exceeding the values specified on Attachment V, shall be replaced or repaired and retested to demonstrate satisfactory operation before being returned to service.

6.3.2 For valves 6 in. and larger, if a leakage rate exceeds the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate by 50% or more, the test frequency shall be doubled and tests scheduled to coincide with a cold shutdown until corrective action is taken, at which time, the original test frequency shall be resumed. When tests show a leakage rate increasing with time, and a projection based on three or more tests indicates that the leakage rate of the next scheduled test will exceed the maximum permissible leakage rate by more than 10%, the valve shall be replaced or repaired and retested to demonstrate satisfactory operation before being returned to service.

6.3.3 The failure of a category A valve to satisfy the leakage rate acceptance criteria of the applicable STP constitutes an inoperable component and may require a Limiting Condition of operation per V. C. Summer Technical Specifications. The STP directing the test will outline any LCO's.

6.4 If any Category C safety/relief valve in a system fails to satisfy the Acceptance Criteria as specified in the STP directing the test the following corrective action steps will be observed.

6.4.1 Any safety/relief valve failing to function properly during test shall be repaired or replaced and shall sucessfully pass a retest before being returned to service.

6.4.2 If any safety/relief valve in a system fails to function properly during a regular test, additional valves in the system shall be tested as determined by an arbitrary assumption that a twelve month operating period has passed to another refueling, and the additional valves shall be tested to make the cumulative total tested at least N/60 x total valves in this category, where N now includes the additional 12 months. (See Attachment II for definition of N.) If any of these additional valves fail to function properly on test, then all valves in the system in this category shall be tested.

6.4.3 If any safety/relief valve fails to satisfy the Acceptance Criteria of the applicable STP it shall be considered inoperable and may require a Limiting Condition for operation per V. C. Summer Technical Specifications. The STP directing the conditions of the test will outline any Limiting Condition of Operation.

6.5 If any Category C check valve fails to satisfy the acceptance criteria of the STP directing the exercising test the following points shall be observed.

6.5.1 Corrective action shall be initiated immediately. If the condition cannot be corrected within 24 hours, the check valve shall be declared inoperative. When corrective action is required as a result of tests made during cold shutdown, the condition shall be corrected before startup. A retest showing acceptable performance shall be run following any required corrective action before the valve is returned to service.

6.5.2 With a check valve inoperable certain Limiting Conditions for Operations as detailed in the V. C. Summer Technical Specifications may apply. The STP directing the test will list any applicable Limiting Condition for Operation.

6.6 The Nuclear Shift Supervisor or Shift Foreman will initially review the test data and compare it to the Acceptance Criteria detailed in the STP. If the results are satisfactory he will sign the data sheet. If the results are unsatisfactory, he shall initiate corrective action including any Limiting Condition for operation required by the V. C. Summer Technical Specifications.

<u>NOTE</u>: The STP conducting the performance of the test will list any Limiting Conditions of Operation.

7.0 ATTACHMENTS

7.1 Attachment I - Valve List

7.2 Attachment II - Safety/Relief Valve Testing Schedule and Category A Permissible Leakage Ra es

7.3 Attachment III - Valve Test Summary

7.4 Attachment IV - List of Applicable STP's

7.5 Attachment V - Allowed leakage for Category A Valves

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-7501	AC	INLET ISOL TO CRDM COOLER (ORC) 6" MOTOR OPERATED VALVE	A / 2a	D-302-852	E-11	NO	YES	FS	YES M-1	CS	STROKE TIME 40 SEC PENET 208 ISOLATION APPROVED STPS
								LT	NO	N/A	
XVG-7502	AC	INLET ISOL TO CRDM COOLER (IRC) 6" MOTOR OPERATED VALVE	A / 2a	D-302-852	D-11	NO	YES	FS	YES M-1	CS	STROKE TIME 40 SEC PENET 208 ISOLATION APPROVED STPS
								LT	NO	N/A	
XVG-7503	AC	OUTLET ISOL FROM CRDM COOLER (IRC) 6" MOTOR OPERATED VALVE	A / 2a	D-302-852	D-11	NO	YES	FS	YES M-1	CS	STROKE TIME 40 SEC PENET 209 ISOLATION APPROVED STPS
								LT	NO	N/A	
XVG-7504	AC	OUTLET ISOL FROM CRDM COOLER (ORC) 6" MOTOR OPERATED VALVE	A / 2a	D-302-852	E-11	NO	YES	FS	YES M-1	CS	STROKE TIME 40 SEC PENET 209 ISOLATION APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVB-002A	AH	RB PURGE EXHAUST ISOL 36" AIR OPERATED VALVE	A / 2a	912-103	G-10	NC	YES	FS	YES N-1	CS	STROKE TIME 5 SEC PENET 101 ISOL APPROVED STPS
								LT	NO	N/A	
XVB-002B	AH	RB PURGE EXHAUST ISOL 36" AIR OPERATED	A / 2a	912-103	H-11	NC	YES	FS	YES N-1	CS	STROKE TIME 5 SEC PENET 101 ISOL APPROVED STPS
								LT	NO	N/A	
XVB-001A	AH	RB PURGE SUPPLY ISOL 36" AIR OPERATED VALVE	A / 2a	912-103	D-6	NC	YES	FS	YES N-1	CS	STROKE TIME 5 SEC PENET 402 ISOL APPROVED STPS
								LT	YES	N/A	
XVB-001B	AH	RB PURGE SUPPLY ISOL 36" AIR OPERATED VALVE	A / 2a	912-103	C-4	NC	YES	FS	YES N-1	CS	STROKE TIME 5 SEC PENET 402 ISOL APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-503A	BD	S/G A BLOWDOWN ISOL 3" AIR OPERATED VALVE	B / 2a	302-781	C-9	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 326 ISOL VALVE APPROVED STP
XVG-503B	BD	S/G B BLOWDOWN ISOL 3" AIR OPERATED VALVE	B / 2a	302-781	F-9	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 224 ISOL VALVE APPROVED STP
XVG-503C	BD	S/G C BLOWDOWN ISOL 3" AIR OPERATED VALVE	B / 2a	302-781	H-9	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 219 ISOL VALVE APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
IVV-7096	CC	SURGE TANK VENT 1 1/2" GLOBE VALVE	B 2b	302-611	F-12	NO	YES	FS	NO	N/A	STROKE TIME 5 SEC APPROVED STP
XVC-9682A	CC	COMPONENT COOLING PP A DISCH CHECK 24" CHECK VALVE	C 2b	302-611	G-5	--	--	CV	NO	N/A	TESTED DURING MONTHLY PUMP TEST APPROVED STP
XVC-9682B	CC	COMPONENT COOLING PP B DISCH CHECK 24" CHECK VALVE	C 2b	302-611	G-5	--	--	CV	NO	N/A	TESTED DURING MONTHLY PUMP TEST APPROVED STP
XVC-9682C	CC	COMPONENT COOLING PP C DISCH CHECK 24" CHECK VALVE	C 2b	302-611	G-6	--	--	CV	NO	N/A	TESTED DURING MONTHLY PUMP TEST APPROVED STP
XVG-9605	CC	CC Rx BLDG INTERNAL ISOL 8" MOTOR OPERATED VALVE	A 2a	302-612	G-12	NO	YES	FS LT	YES A-5 NO	CS N/A	STROKE TIME 60 SEC PENET 330 ISOL VALVE APPROVED STPS
XVG-9606	CC	CC Rx BLDG EXTERNAL ISOL 8" MOTOR OPERATED VALVE	A 2b	302-612	H-12	NO	YES	FS LT	YES A-5 NO	CS N/A	STROKE TIME 60 SEC PENET 330 ISOL APPROVED STPS
XVG-9568	CC	CC Rx BLDG EXTERNAL ISOL 8" MOTOR OPERATED VALVE	A 2a	302-612	H-11	NO	YES	FS LT	YES A-5 NO	CS N/A	STROKE TIME 60 SEC PENET 312 ISOL VALVE APPROVED STPS

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-9570	CC	CC Rx BLDG INTERNAL CHECK 8" CHECK VALVE	A/C 2a	302-612	G-12	--	--	CV LT	YES A-1 NO	CS N/A	PENET 312 ISOL APPROVED STPS
XVG-9600	CC	Rx BLDG EXTERNAL ISOL 3" MOTOR OPERATED VALVE	A 2a	302-612	F-2	NO	YES	FS LT	YES A-3 NO	CS N/A	STROKE TIME 60 SEC PENET 204 ISOL VALVE APPROVED STPS
XVC-9602	CC	Rx BLDG INTERNAL CHECK 3" CHECK VALVE	A/C 2a	302-612	F-1	--	--	CV LT	YES A-2 NO	CS N/A	PENET 204 ISOL VALVE APPROVED STPS
XVR-9502A	CC	CCW PUMP 1A DISCH HEADER RELIEF	C 2b	D-302-611	G-7	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-9502B	CC	CCW PUMP 1B DISCH HEADER RELIEF	C 2b	D-302-611	G-4	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-9502C	CC	CCW PUMP 1C DISCH RELIEF VALVE	C 2b	D-302-611	H-6	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-19545	CC	A SPENT FUEL HEAT EXCHANGER RELIEF	C 2b	D-302-613	F-11	--	--	SRV	NO	N/A	SETPOINT 160 psig APPROVED STP
XVR-19544	CC	B SPENT FUEL HEAT EXCHANGER RELIEF	C 2b	D-302-613	H-11	--	--	SRV	NO	N/A	SETPOINT 160 psig APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVR-9662A	CC	CCW TO A CAT. HYDROGEN RECOMBINER RELIEF VALVE	C / 2b	D-302-613	J-7	--	--	SRV	NO	N/A	SETPOINT 160 psig APPROVED STP
XVR-9662B	CC	CCW TO B CAT. HYDROGEN RECOMBINER RELIEF VALVE	C / 2b	D-302-613	H-7	--	--	SRV	NO	N/A	SETPOINT 160 psig APPROVED STP
XVR-19540	CC	B COMP COOLING WATER HEAT EXCHANGER RELIEF VALVE	C / 2b	D-302-611	B-3	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-9504A	CC	RHR HEAT EXCHANGER A CCW RELIEF VALVE	C / 2b	D-302-611	B-8	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-9504B	CC	RHR HEAT EXCHANGER B CCW RELIEF VALVE	C / 2b	D-302-611	B-5	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-19538	CC	A COMP COOLING WATER HEAT EXCHANGER RELIEF VALVE	C / 2b	D-302-611	B-9	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVR-9571	CC	CCW SUPPLY HEADER RELIEF VALVE	C / 2b	D-302-612	F-13	--	--	SRV	NO	N/A	SETPOINT 150 psig APPROVED STP
XVG-9627A	CC	SW TO CC X-CONNECT ISOLATION VALVE 4" VALVE	/ 2b	D-302-611	J-12			N/A			No Test Required Per NRC Phone Call on 9-17-82

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-9627B	CC	SW TO CC X-CONNECT ISOLATION VALVE 4" VALVE	2b	D302-611	J-12						No Test Required Per NRC Phone Call on 9-27-82

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVT-8152	CS	LETDOWN FROM REGEN HX HDR ISOL (ORC) 3" AIR OPERATED GLOBE VALVE	A / 2a	114E073 (1)	J-2	NO	YES	FS	YES B-8	CS	STROKE TIME 40 SEC PENET 318 ISOL (ORC) APPROVED STPS
								LT	NO	N/A	
XVC-8381	CS	CHARGING FROM REGEN HX HDR CHECK (IRC) 3" CHECK VALVE	A/C / 2a	114E073 (1)	J-3	--	--	CV	YES B-9	CS	PENET 409 ISOL VLV APPROVED STPS
								LT	NO	N/A	
XVT-8149A	CS	LETDOWN FLOW CONTROL (45 GPM) 2" AIR OPERATED GLOBE	A / 2a	114E073 (1)	J-8	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 318 ISOL (IRC) APPROVED STPS
								LT	NO	N/A	
XVT-8149B	CS	LETDOWN FLOW CONTROL (50 GPM) 2" AIR OPERATED GLOBE	A / 2a	114E073 (1)	J-7	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 318 ISOL (IRC) APPROVED STPS
								LT	NO	N/A	
XVT-8149C	CS	LETDOWN FLOW CONTROL (60 GPM) 2" AIR OPERATED GLOBE	A / 2a	114E073 (1)	J-7	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 318 ISOL (IRC) APPROVED STPS
								LT	NO	N/A	
XVT-8100	CS	RCP SEAL RETURN HDR ISOL (ORC) 2" MOTOR OPERATED VALVE	A / 2a	114E073 (1)	H-2	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 410 ISOL APPROVED STPS
								LT	YES B-11	CS	
XVT-8112	CS	RCP SEAL RETURN HDR ISOL (IRC) 2" MOTOR OPERATED VALVE	A / 2a	114E073 (1)	H-2	NO	YES	FS	YES B-11	CS	STROKE TIME 40 SEC PENET 410 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-8107	CS	CHG HEADER ISOL 3" MOTOR OPERATED VALVE	A / 2a	114E073 (3)	E-13	NO	YES	LT FS	NO YES B-10	N/A CS	STROKE TIME 10 SEC PENET 409 ISOL VALVE APPROVED STPS
XVG-8108	CS	CHG HEADER ISOL 3" MOTOR OPERATED VALVE	B / 2a	114E073 (3)	E-13	NO	YES	FS	YES B-10	CS	STROKE TIME 10 SEC APPROVED STP
XVC-8481A	CS	CHG PUMP A DISCHARGE CK 3" CHECK VALVE	C / 2a	114E073 (3)	E-9	--	--	CV	YES B-2	RS	APPROVED STP
XVC-8481B	CS	CHG PUMP B DISCHARGE CHECK 3" CHECK VALVE	C / 2a	114E073 (3)	C-9	--	--	CV	YES B-2	RS	APPROVED STP
XVC-8481C	CS	CHG PUMP B DISCHARGE CHECK 3" CHECK VALVE	C / 2a	114E073 (3)	D-9	--	--	CV	YES B-2	RS	APPROVED STP
LCV-115C	CS	VCT OUTLET ISOLATION 4" MOTOR OPERATED	B / 2a	114E073 (3)	F-7	NO	YES	FS	YES B-1	CS	STROKE TIME 10 SEC APPROVED STP
LCV-115E	CS	VCT OUTLET HDR ISOL 4" MOTOR OPERATED	B / 2a	114E073 (3)	F-7	NO	YES	FS	YES B-1	CS	STROKE TIME 10 SEC APPROVED STP
LCV-115B	CS	RWST ISOL TO CHARGE PUMP A SUCTION HEADER 8" MOTOR OPERATED	B / 2a	114E073 (3)	D-6	NC	YES	FS	NO	N/A	STROKE TIME 14 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
LCV-115D	CS	RWST ISOL TO CHARGE PUMP B SUCTION HEADER 8" MOTOR OPERATED	B / 2a	114E073 (3)	C-6	NC	YES	FS	NO	N/A	STROKE TIME 14 SEC APPROVED STP
XVT-8104	CS	EMERGENCY BORATE VALVE 2" MOTOR OPERATED VALVE	B / 2a	114E073 (3)	D-3	NC	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVC-8442	CS	BA TO CHG PUMP C HEADER CHECK	C / 2a	114E073 (3)	D-2	--	--	CV	YES B-7	CS	APPROVED STP
XVC-8314A	CS	BORIC ACID TRANSFER PUMP A DISCH CHECK	C / 2b	114E073 (5)	E-9	--	--	CV	NO	N/A	VALVE WILL BE TESTED WITH THE PUMP TEST APPROVED STP
XVC-8314B	CS	BORIC ACID TRANSFER PUMP B DISCH CHECK	C / 2b	114E073 (5)	C-9	--	--	CV	NO	N/A	VALVE WILL BE TESTED WITH THE PUMP TEST APPROVED STP
XVR-8116A	CS	RH HEADER TO CHARGING PUMP A RELIEF	C / 2a	114E073 (3)	D-5	--	--	SRV	NO	N/A	SETPOINT 220 psig APPROVED STP
XVR-8116B	CS	RH HEADER TO CHARGING PUMP B RELIEF	C / 2a	114E073 (3)	C-5	--	--	SRV	NO	N/A	SETPOINT 220 psig APPROVED STP
XVC-8480A	CS	CHG/SI PUMP A MINIFLOW HDR. CHECK VLV. 2" VALVE	C / 2a	114E073 (3)	F-9	--	--	CV	NO	N/A	VALVE WILL BE TESTED DURING PUMP TEST APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8480B	CS	CHG/SI PUMP B MINIFLOW HDR. CHECK VLV. 2" CHECK VALVE	C / 2a	114E073 (3)	C-9	--	--	CV	NO	N/A	VALVE WILL BE TESTED DURING PUMP TEST APPROVED STP
XVC-8480C	CS	CHG/SI PUMP C MINIFLOW HDR. CHECK VLV. 2" CHECK VALVE	C / 2a	114E073 (3)	E-9	--	--	CV	NO	N/A	VALVE WILL BE TESTED DURING PUMP TEST APPROVED STP
XVC-8440	CS	CHG/SI PUMP A, B & C INLET HEADER VALVE 4" CHECK VALVE	C / 2a	114E073 (3)	F-7	--	--	CV	NO	N/A	VALVE WILL BE TESTED DURING PUMP TEST APPROVED STP
XVR-8117	CS	CVCS LETDOWN HDR RELIEF VALVE 2" VALVE	A/C / 2a	114E073(1)	J-8	--	--	LT	NO	N/A	SETPOINTS APPROVED STPS
								SRV	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-972A	DG	2" CHECK VALVE	C / 2b	302-351	G-14	--	--	CV	NO	N/A	APPROVED STP
XVC-972B	DG	2" CHECK VALVE	C / 2b	302-351	G-1	--	--	CV	NO	N/A	APPROVED STP
XVC-970A	DG	2" CHECK VALVE	C / 2b	302-351	G-12	--	--	CV	NO	N/A	APPROVED STP
XVC-970B	DG	2" CHECK VALVE	C / 2b	302-351	G-3	--	--	CV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-971A	DG	3" CHECK VALVE	C / 2b	302-351	G-11	--	--	CV	NO	N/A	APPROVED STP
XVC-971D	DG	3" CHECK VALVE	C / 2b	302-351	G-4	--	--	CV	NO	N/A	APPROVED STP
XVR-979A	DG	DG FUEL OIL TRANSFER PUMP 141A DISCH HEADER RELIEF	C / 2a	D-302-351	G-13	--	--	SRV	NO	N/A	SETPOINT 63 psig APPROVED STP
XVR-980A	DG	DG FUEL OIL TRANSFER PUMP 4A DISCH HEADER RELIEF	C / 2a	D-302-351	G-12	--	--	SRV	NO	N/A	SETPOINT 63 psig APPROVED STP
XVR-979B	DG	DG FUEL OIL TRANSFER PUMP 141B DISCH HEADER RELIEF	C / 2a	D-302-351	G-2	--	--	SRV	NO	N/A	SETPOINT 63 psig APPROVED STP
XVR-980B	DG	DG FUEL OIL TRANSFER PUMP 4B DISCH HEADER RELIEF	C / 2a	D-302-351	G-3	--	--	SRV	NO	N/A	SETPOINT 63 psig APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-1039A	EF	EF HDR INLET CK TO A S/G 4" CHECK VALVE	C / 2a	302-083	C-12	--	--	CV	YES C-1	CS	APPROVED STP
XVC-1039B	EF	EF HDR INLET CK TO B S/G 4" CHECK VALVE	C / 2a	302-083	E-12	--	--	CV	YES C-1	CS	APPROVED STP
XVC-1039C	EF	EF HDR INLET CK TO C S/G 4" CHECK VALVE	C / 2a	302-083	G-12	--	--	CV	YES C-1	CS	APPROVED STP
XVC-1038A	EF	EF HDR SUPPLY CK TO A S/G 4" CHECK VALVE	C / 2a	302-083	C-12	--	--	CV	YES C-1	CS	APPROVED STP
XVC-1038B	EF	EF HDR SUPPLY CK TO B S/G 4" CHECK VALVE	C / 2a	302-083	E-12	--	--	CV	YES C-1	CS	APPROVED STP
XVC-1038C	EF	EF HDR SUPPLY CK TO C S/G 4" CHECK VALVE	C / 2a	302-083	H-12	--	--	CV	YES C-1	CS	APPROVED STP
XVC-1015B	EF	MOTOR DRIVE EFWP 21B DISCH CHECK 4" CHECK VALVE	C / 2b	302-085	F-8	--	--	CV	YES C-2	CS	APPROVED STP
XVC-1009A	EF	EF HDR DISCH CK VALVE ISOL S/G A 4" AIR OPERATED SPL CK	C / 2a	302-085	B-12	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-1009B	EF	EF HDR DISCH CK VALVE ISOL S/G B 4" AIR OPERATED SPL CK	C / 2a	302-085	D-12	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP
XVC-1009C	EF	EF HDR DISCH CK VALVE ISOL S/G C 4" AIR OPERATED SPL CK	C / 2a	302-085	G-12	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP
IFV-3531	EF	EFWP MOTOR DRIVE EFWP TO A S/G 3" AIR OPERATED VALVE	B / 2b	302-085	A-9	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP
IFV-3541	EF	EFWP MOTOR DRIVE EFWP TO B S/G 3" AIR OPERATED VALVE	B / 2b	302-085	D-9	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP
IFV-3551	EF	EF FM MOTOR DRIVE EFWP TO C S/G 3" AIR OPERATED VALVE	B / 2b	302-085	F-9	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP
XVG-1001A	EF	SUPP FM [illegible] TO EFWP 21A ISOL 6" MOTOR OPERATED VALVE	B / 2b	302-085	D-5	NC	YES	FS	YES C-3	CS	STROKE TIME 33 SEC APPROVED STP
XVG-1001B	EF	SUPP FW SW TO EFWP 21B ISOL 6" MOTOR OPERATED VALVE	B / 2b	302-085	G-5	NC	YES	FS	YES C-3	CS	STROKE TIME 33 SEC APPROVED STP
XVC-1014	EF	SUPP FM CST TO XPP 8A 8" CHECK VALVE	C / 2b	302-085	H-5	--	--	CV	YES C-6	CS	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-1002	EF	SUPP FW SW LOOP A TO TURB DRIVE EFWP HDR ISOL 8" MOTOR OPERATED VALVE	B / 2b	302-085	J-5	NC	YES	FS	YES C-4	CS	STROKE TIME 42 SEC APPROVED STP
XVG-1008	EF	SUPP FW SW LOOP B TO TURB DRIVE EFWP HDR ISOL 8" MOTOR OPERATED VALVE	B / 2b	302-085	J-6	NC	YES	FS	YES C-4	CS	STROKE TIME 42 SEC APPROVED STP
XVG-1037A	EF	SUPP FW SW LOOP A TO TURB DRIVE EFWP MN ISOL 8" MOTOR OPERATED VALVE	B / 2b	302-085	F-2	NC	YES	FS	YES C-4	CS	STROKE TIME 42 SEC APPROVED STP
XVG-1037B	EF	SUPP FW SW LOOP B TO TURB DRIVE EFWP MN ISOL 8" MOTOR OPERATED VALVE	B / 2b	302-085	G-2	NC	YES	FS	YES C-4	CS	STROKE TIME 42 SEC APPROVED STP
IFV-3536	EF	EF FW TURB DRIVE EFWP TO A S/G 3" AIR OPERATED VALVE	B / 2b	302-085	B-9	NO	YES	FS	N[illegible]	N/A	STROKE TIME 30 SEC APPROVED STP
IFV-3546	EF	EF FW TURB EFWP TO B S/G 3" AIR OPERATED VALVE	B / 2b	302-085	E-9	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP
IFV-3556	EF	EF FW TURB EFWP TO C S/G 3" AIR OPERATED VALVE	B / 2b	302-085	G-9	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP
XVC-1016	EF	TURB DRIVE EFWP DISCH CK 4" CHECK VALVE	C / 2b	302-085	H-9	--	--	CV	YES C-5	CS	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-1015A	EF	MOTOR DRIVE EFWP 21A DISCH 4" CHECK VALVE	C / 2b	302-085	A-8	--	--	CV	YES C-2	CS	APPROVED STP
XVC-1013A	EF	SUPP FM CST TO 21A CHECK 6" CHECK VALVE	C / 2b	302-085	D-5	--	--	CV	YES C-6	CS	APPROVED STP
XVC-1013B	EF	SUPP FM CST TO EFWP 21B CHECK 6" CHECK VALVE	C / 2b	302-085	F-4	--	--	CV	YES C-6	CS	APPROVED STP
XVC-1023A	EF	MTR DRIVEN EF PP A RECIR HDR CHK VLV 2" CHECK VALVE	C / 2b	302-085	A-7	--	--	CV	NO	N/A	APPROVED STP
XVC-1023B	EF	MTR DRIVEN EF PP B RECIR HDR CHK VLV 2" CHECK VALVE	C / 2b	302-085	F-7	--	--	CV	NO	N/A	APPROVED STP
XVC-1027	EF	EF RECIR HEADER CHECK VALVE 4" CHECK VALVE	C / 2b	302.085	C-4	--	--	CV	NO	N/A	APPROVED STP
XVC-1024	EF	TURB DRIVEN EF PP RECIRC HDR CHK VLV 3" CHECK VALVE	C / 2b	302.085	H-8	--	--	CV	NO	N/A	APPROVED STP
XVK-1019A	EF	S/G A MOTOR DWN EFWP SUPPLY STAY CHECK 4" STAY CHECK VALVE	C / 2B	302.085	A-10	--	--	CV	YES C-8	CS	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVK-1019B	EF	S/G B MOTOR DR EFWP SUPPLY STOP CHECK 4" STOP CHECK VALVE	C / 2B	302.085	D-10	--	--	CV	YES C-8	CS	APPROVED STP
XVK-1019C	EF	S/G MOTOR DR EFWP SUPPLY STOP CHECK 4" STOP CHECK VALVE	C / 2b	302.085	F-10	--	--	CV	YES C-8	CS	APPROVED STP
XVC-1022A	EF	TURB DRIVEN EF PP SUCT CHECK FROM SW A	C / 2b	302-085	H-6	--	--	CV	YES C-7	RS	APPROVED STP
XVC-1022B	EF	TURB DRIVEN EF PP SUCT CHECK FROM SW B	C / 2b	302-085	H-5	--	--	CV	YES C-7	RS	APPROVED STP
XVC-1034A	EF	MOTOR DRIVEN EF PP SUCT CHECK FROM SW A	C / 2b	302-085	D-5	--	--	CV	YES C-7	RS	APPROVED STP
XVC-1034B	EF	MOTOR DRIVEN EF PP SUCT CHECK FROM SW B	C / 2b	302-085	F-5	--	--	CV	YES C-7	RS	APPROVED STP
XVK-1020A	EF	SG A TURB DR EFWP SUPPLY STOP CHECK 4" STOP CHECK VAVLE	C / 2b	302.085	B-10	--	--	CV	YES C-8	CS	APPROVED STP
XVK-1020B	EF	SG B TURB DR EFWP SUPPLY STOP CHECK 4" STOP CHECK VALVE	C / 2b	302.085	E-10	--	--	CV	YES C-8	CS	APPROVED STP
XVK-1020C	EF	SG C TURB DR EFWP SUPPLY STOP CHECK 4" STOP CHECK VALVE	C / 2b	302.085	G-10	--	--	CV	YES C-8	CS	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-6797	FS	ISOL DELUGE TO RB CHARCOAL CLEANUP 4" MOTOR OPERATED	A / 2a	302-231	D-6	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 427 ISOL APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVK-1633A	FW	CHEM FD SUPP TO A S/G ISOL 1 1/2" EMO STOP CHECK	B/C 2a	302-083	B-9	NO	YES	FS	NO	N/A	STROKE TIME 60 SEC APPROVED STP
XVK-1633B	FW	CHEM FD SUPP TO B S/G ISOL 1 1/2" EMO STOP CHECK	B/C 2a	302-083	D-9	NO	YES	FS	NO	N/A	STROKE TIME 60 SEC APPROVED STP
XVK-1633C	FW	CHEM FD SUPP TO C S/G ISOL 1 1/2" EMO STOP CHECK	B/C 2a	302-083	G-9	NO	YES	FS	NO	N/A	STROKE TIME 60 SEC APPROVED STP
XVG-1611A	FW	MN FD WTR SUPP A S/G ISOL 18" AIR TO HYDRAULIC	B 2a	302-083	B-6	NO	YES	FS	YES D-1	CS	STROKE TIME 5 SEC APPROVED STP
XVG-1611B	FW	MN FD WTR SUPP B S/G ISOL 18" AIR TO HYDRAULIC	B 2a	302-083	E-6	NO	YES	FS	YES D-1	CS	STROKE TIME 5 SEC APPROVED STP
XVG-1611C	FW	MN FD WTR SUPP C S/G ISOL 18" AIR TO HYDRAULIC	B 2a	302-083	G-6	NO	YES	FS	YES D-1	CS	STROKE TIME 5 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVX-6050A	HR	RB SAMPLE TO H2 ANAL A 3/8" SOLENOID OPERATED VALVE	A / 2a	302-861	C-12	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 5 SEC PENET 301 ISOL APPROVED STPS
XVX-6054	HR	POST ACC H2 CONT ISOL VALVE FOR PT 8254 3/8" SOLENOID OPERATED VALVE	A / 2a	302-861	D-10	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 5 SEC PENET 301 ISOL APPROVED STPS
XVG-6056	HR	RB INLET FROM PURGE BLOWER 6" AIR OPERATED VALVE	A / 2a	302-861	G-11	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 5 SEC PENET 103 ISOL APPROVED STPS
XVG-6057	HR	BACKUP PURGE LINE RB ISOL 6" AIR OPERATED VALVE	A / 2a	302-861	G-10	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 5 SEC PENET 103 ISOL APPROVED STPS
XVG-6066	HR	RB INLET TO PURGE BLOWER 6" AIR OPERATED VALVE	A / 2a	302-861	K-11	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 5 SEC PENET 302 ISOL APPROVED STPS
XVG-6067	HR	BACKUP PURGE INLET ISOL 6" AIR OPERATED VALVE	A / 2a	302-861	K-10	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 5 SEC PENET 302 ISOL APPROVED STPS

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-2660	IA	2" AIR OPERATED VALVE	A / 2b	302-273	G-4	NO	YES	FS	YES F-1	RS	STROKE TIME 40 SEC PENET 311 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-2661	IA	2" CHECK VALVE	A/C / 2a	302-273	G-3	--	--	CY	YES F-2	CS	PENET 311 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-2662A	IA	6" AIR OPERATED VALVE	A / 2a	302-273	B-4	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 319 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-2662B	IA	6" AIR OPERATED VALVE	A / 2a	302-273	B-3	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 319 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVS-2806A	MS	MN STEAM LINE A SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	B-7	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806B	MS	MN STEAM LINE A SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	B-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806C	MS	MN STEAM LINE A SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	B-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806D	MS	MN STEAM LINE A SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	B-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806E	MS	MN STEAM LINE A SAFETY VALVE 6 x 10 RELIFF VALVE	C / 2a	302-011	B-5	--	--	SRV	NO	N/A	APPROVED STP
IPV-2000	MS	MS LINE A POWER RELIEF VALVE 8" AIR OPERATED VALVE	B / 2a	302-011	C-7	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP
XVM-2801A	MS	MN STEAM LINE A ISOL 32" AIR OPERATED VALVE	B / 2a	302-011	B-5	NO	YES	FS	YES G-1	CS	STROKE TIME 5 SEC APPROVED STP
XVM-2801B	MS	MN STEAM LINE B ISOL 32" AIR OPERATED VALVE	B / 2a	302-011	D-3	NO	YES	FS	YES G-1	CS	STROKE TIME 5 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-2869A	MS	MS LINE A ISOLATION BYLASS VALVE 4" AIR OPERATED VALVE	B / 2a	302-011	C-4	NC	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-2869B	MS	MS LINE B ISOLATION BYPASS VALVE 4" AIR OPERATED VALVE	B / 2a	302-011	E-3	NC	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-2869C	MS	MS LINE C ISOLATION BYPASS VALVE 4" AIR OPERATED VALVE	B / 2a	302-011	G-4	NC	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVS-2806F	MS	MS STEAM LINE B SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	E-7	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806G	MS	MN STEAM LINE B SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	E-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806H	MS	MN STEAM LINE B SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	E-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806I	MS	MN STEAM LINE B SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	E-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806J	MS	MN STEAM LINE B SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	E-5	--	--	SRV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
IPV-2010	MS	MN STEAM LINE B POWER RELIEF 8" AIR OPERATED VALVE	B / 2a	302-011	D-7	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP
XVG-2802A	MS	MN STEAM LOOP B TO EFWP TURB 4" MOTOR OPERATED VALVE	B / 2a	302-011	E-8	NO	YES	FS	NO	N/A	STROKE TIME 20 SEC APPROVED STP
XVG-2802B	MS	MN STEAM LOOP C TO EFWP TURB 4" MOTOR OPERATED VALVE	B / 2a	302-011	G-5	NO	YES	FS	NO	N/A	STROKE TIME 20 SEC APPROVED STP
XVC-2876A	MS	MN STEAM LOOP B TO EFWP CK 4" CHECK VALVE	C / 2b	302-011	E-5	--	--	CV	NO	N/A	APPROVED STP
XVC-2876B	MS	MN STEAM LOOP C TO EFWP CK 4" CHECK VALVE	C / 2b	302-011	F-5	--	--	CV	NO	N/A	APPROVED STP
IFV-2030	MS	STEAM STOP VALVE TO EFWP TURB 4" AIR OPERATED VALVE	B / 2b	302-011	E-4	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP
IPV-2020	MS	MN STEAM LINE C POWER RELIEF 8" AIR OPERATED VALVE	B / 2a	302-011	G-7	NC	YES	FS	NO	N/A	STROKE TIME 3 SEC APPROVED STP
XVM-2801C	MS	MN STEAM LINE C ISOL 32" AIR OPERATED VALVE	B / 2a	302-011	G-5	NO	YES	FS	YES G-1	CS	STROKE TIME 5 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-2813	MS	MS TO EFWP TURB DRAIN ISOL 1 1/2" MOTOR OPERATED VALVE	B / 2b	302-011	H-3	NO	YES	FS	NO	N/A	STROKE TIME 21 SEC APPROVED STP
XVS-2806K	MS	MN STEAM LINE C SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	F-7	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806L	MS	MN STEAM LINE C SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	G-7	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806M	MS	MN STEAM LINE C SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	F-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806N	MS	MN STEAM LINE C SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	G-6	--	--	SRV	NO	N/A	APPROVED STP
XVS-2806P	MS	MN STEAM LINE C SAFETY VALVE 6 x 10 RELIEF VALVE	C / 2a	302-011	F-6	--	--	SRV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CIS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVD-6242A	ND	RB SUMP DISCH HDR ISOL 3" AIR OPERATED VALVE	A / 2a	302-821	A-9	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 424 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVD-6242B	ND	RB SUMP DISCH CONT ISOL 3" AIR OPERATED VALVE	A / 2a	302-821	A-8	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 424 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVD-8033	RC	P.R.T VENT & N2 HDR ISOL 1" AIR OPERATED (DIAPHRAGM)	A / 2a	114E072 (2)	J-5	NO	YES	FS LT	NO NO	N/A N/A	STROKE TIME 40 SEC PENET 420 ISOL APPROVED STPS
XVD-8047	RC	P.R.T VENT & N2 HDR ISOL(IRC) 1" AIR OPERATED (DIAPHRAGM)	A / 2a	114E072 (2)	I-5	NO	YES	FS LT	NO NO	N/A N/A	STROKE TIME 40 SEC PENET 420 ISOL APPROVED STPS
XVD-8028	RC	P.R.T SPRAY HDR ISOL (ORC) 3" AIR OPERATED	A / 2a	114E072 (2)	I-2	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 40 SEC PENET 422 ISOL APPROVED STPS
XVC-8046	RC	P.R.T SPRAY HDR CHECK 3" CHECK	A/C / 2a	114E072 (2)	I-3	--	--	CV LT	NO NO	N/A N/A	PENET 422 ISOL VALVE APPROVED STPS
XVR-8010A	RC	PRZR CODE SAFETY 6" RELIEF VALVE	C / 1	114E072 (2)	G-9	--	--	SRV	NO	N/A	APPROVED STP
XVR-8010B	RC	PRZR CODE SAFETY 6" RELIEF VALVE	C / 1	114E072 (2)	G-11	--	--	SRV	NO	N/A	APPROVED STP
XVR-8010C	RC	PRZR CODE SAFETY 6" RELIEF VALVE	C / 1	114E072 (2)	G-12	--	--	SRV	NO	N/A	APPROVED STP
XVT-8095A	RC	REACTOR VESSEL HEAD VENT 2" MOTOR OPERATED	B / 1	114E072 (1)	F-6	NC	YES	FS	NO	N/A	STROKE TIME 23 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVT-8095B	RC	REACTOR VESSEL HEAD VENT 2" MOTOR OPERATED	B / 1	114E072 (2)	F-5	NC	YES	FS	NO	N/A	STROKE TIME 23 SEC APPROVED STP
XVT-8096A	RC	REACTOR VESSEL HEAD VENT 2" MOTOR OPERATED	B / 1	114E072 (1)	E-6	NO	YES	FS	NO	N/A	STROKE TIME 23 SEC APPROVED STP
XVT-8096B	RC	REACTOR VESSEL HEAD VENT 2" MOTOR OPERATED	B / 1	114E072 (1)	E-5	NO	YES	FS	NO	N/A	STROKE TIME 23 SEC APPROVED STP
PCV-445A	RC	PRZR PWR OP RELIEF 3" AIR OPERATED	B / 1	114E072 (2)	G-13	NC	YES	FS	YES Q-1	CS	STROKE TIME 2 SEC (ACTUATED W/HP NITROGEN) APPROVED STP
PCV-445B	RC	PRZR PWR OP RELIEF 3" AIR OPERATED	B / 1	114E072 (2)	F-13	NC	YES	FS	YES Q-1	CS	STROKE TIME 10 SEC APPROVED STP
PCV-444B	RC	PRZR PWR OP RELIEF 3" AIR OPERATED	B / 1	114E072 (2)	F-13	NC	YES	FS	YES Q-1	CS	STROKE TIME 2 SEC APPROVED STP (ACTUATED W/HP NITROGEN)
XVG-8000A	RC	PZR PWR OPER RELIEF VALVE ISOLATION 3" MOTOR OPERATED	B / 1	114E072 (2)	G-13	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-8000B	RC	PZR PWR OPER RELIEF VALVE ISOLATION 3" MOTOR OPERATED	B / 1	114E072 (2)	F-13	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVT-8000C	RC	PZR PWR OPER RELIEF VALVE ISOLATION	B / 1	114E072 (2)	F-13	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8716B	RH	RH SUPPLY HDR B CHECK 10" CHECK VALVE	C 2a	114E074	H-10	--	--	CV	NO	N/A	APPROVED STP
XVC-8716A	RH	RH SUPPLY HDR A CHECK 10" CHECK VALVE	C 2a	114E074	I-10	--	--	CV	NO	N/A	APPROVED STP
FCV-602A	RH	RH PUMP A MINIFLOW VALVE 2" MOTOR OPERATED	B 2a	114E074	F-9	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
FCV-602B	RH	RH PUMP B MINIFLOW VALVE 2" MOTOR OPERATED	B 2a	114E074	F-9	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVR-8708A	RH	RHR A HDR RELIEF 3" RELIEF VALVE	A/C 2a	114E074	D-11	--	--	SRV LT	NO NO	N/A N/A	SETPOINT 450 psig APPROVED STP
XVR-8708B	RH	RHR B HDR RELIEF 3" RELIEF VALVE	A/C 2a	114E074	F-11	--	--	SRV LT	NO NO	N/A N/A	SETPOINT 450 psig APPROVED STPS
XVG-8706A	RH	CHARGING PUMP SUCTION TO A LOOP RHR 8" MOTOR OPERATED VLV	B 2a	114E074	I-6	NC	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-8706B	RH	CHARGING PUMP SUCTION TO B LOOP RHR 8" MOTOR OPERATED VLV	B 2a	114E074	G-6	NC	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-8801A	SI	BORON INJ TK OUTLET 3" MOTOR OPERATED VALVE	B / 2a	114E075 (1)	G-13	NC	YES	FS	YES J-16	RS	STROKE TIME 10 SEC PENET 426 ISOL VALVE APPROVED STP
XVG-8801B	SI	BORON INJ TK OUTLET 3" MOTOR OPERATED VALVE	B / 2a	114E075 (1)	G-13	NC	YES	FS	YES J-16	RS	STROKE TIME 10 SEC PENET 426 ISOL VALVE APPROVED STP
XVG-8885	SI	HI HD HOT LEG INJ ISOL 3" MOTOR OPERATED VALVE	B / 2a	114E075 (1)	G-7	NC	YES	FS	YES J-13	CS	STROKE TIME 10 SEC PENET 222 ISOL VALVE APPROVED STP
XVC-8998A	SI	LOW HD COLD LEG TO LOOP A CK 6" CHECK VALVE	A/C / 1	114E075 (1)	J-13	--	--	CV	YES J-1	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8998B	SI	LOW HD COLD LEG TO LOOP B CK 6" CHECK VALVE	A/C / 1	114E075 (1)	J-13	--	--	CV	YES J-1	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8998C	SI	LOW HD COLD LEG TO LOOP C CK 6" CHECK VALVE	A/C / 1	114E075 (1)	I-13	--	--	CV	YES J-1	CS	APPROVED STPS
								LT	NO	N/A	
XVG-8884	SI	HI HEAD HOT LEG INJECTION ISOLATION A TRAIN 3" MOTOR OPERATED VLV	B / 2a	114E075 (1)	G-5	NC	YES	FS	YES J-13	CS	STORKE TIME 10 SEC PENET 415 ISOL VALVE APPROVED STP
XVG-8886	SI	HI HEAD HOT LEG INJECTION ISOLATION B TRAIN 3" MOTOR OPERATED VLV	B / 2a	114E075 (1)	G-7	NC	YES	FS	YES J-13	CS	STROKE TIME 1) SEC PENET 412 ISOL VALVE APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8997A	SI	HI HD COLD LEG LOOP A CHECK 2" CHECK VALVE	A/C 1	114E075 (1)	I-13	--	--	CV	YES J-2	RS	PENET 426 ISOL APPROVED STPS
								LT	NO	N/A	
XVC-8997B	SI	HI HD COLD LEG LOOP B CHECK 2" CHECK VALVE	A/C 1	114E075 (1)	I-12	--	--	CV	YES J-2	RS	PENET 426 ISOL APPROVED STPS
								LT	NO	N/A	
XVC-8997C	SI	HI HD COLD LEG LOOP C CHECK 2" CHECK VALVE	A/C 1	114E075 (1)	I-12	--	--	CV	YES J-2	RS	PENET 426 ISOL APPROVED STPS
								LT	NO	N/A	
XVC-8995A	SI	HI HD HOT LEG LOOP A CHECK 2" CHECK VALVE	A/C 1	114E075 (1)	I-11	--	--	CV	YES J-3	RS	PENET 222 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8995B	SI	HI HD HOT LEG LOOP B CHECK 2" CHECK VALVE	A/C 1	114E075 (1)	I-10	--	--	CV	YES J-3	RS	PENET 222 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8995C	SI	HI HD HOT LEG LOOP C CHECK 2" CHECK VALVE	A/C 1	114E075 (1)	I-9	--	--	CV	YES J-3	RS	PENET 222 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8988A	SI	RHR SUPPLY TO RCS LOOP A 6" CHECK VALVE	A/C 1	114E075 (1)	J-7	--	--	CV	YES J-4	CS	PENET 325 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8988B	SI	RHR SUPPLY TO RCS LOOP B 6" CHECK VALVE	A/C 1	114E075 (1)	J-7	--	--	CV	YES J-4	CS	PENET 325 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8993A	SI	HI HD HOT LEG LOOP A HDR CHECK 6" CHECK VALVE	A/C / 1	114E075 (1)	J-3	--	--	CV	YES J-5	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8993B	SI	HI HD HOT LEG LOOP B HDR CK 6" CHECK VALVE	A/C / 1	114E075 (1)	J-3	--	--	CV	YES J-5	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8993C	SI	HI HD HOT LEG LOOP C HDR CK 6" CHECK VALVE	A/C / 1	114E075 (1)	I-3	--	--	CV	YES J-15	RS	APPROVED STPS
								LT	NO	N/A	
XVC-8990A	SI	HI HD HOT LEG LOOP A CHECK 2" CHECK VALVE	A/C / 1	114E075 (1)	I-7	--	--	CV	YES J-6	RS	PENET 412 ISOL VALVE
								LT	NO	N/A	APPROVED STPS
XVC-8990B	SI	HI HD HOT LEG LOOP B CHECK 2" CHECK VALVE	A/C / 1	114E075 (1)	I-6	--	--	CV	YES J-6	RS	PENET 412 ISOL VALVE
								LT	NO	N/A	APPROVED STPS
XVC-8990C	SI	HI HD HOT LEG LOOP B CHECK 2" CHECK VALVE	A/C / 1	114E075 (1)	I-5	--	--	CV	YES J-6	RS	PENET 412 ISOL VALVE
								LT	NO	N/A	APPROVED STPS
XVC-8992A	SI	HI HD HOT LEG LOOP A CHECK 2" CHECK VALVE	A/C / 1	114E075 (1)	I-5	--	--	CV	YES J-7	RS	PENET 415 ISOL VALVE
								LT	NO	N/A	APPROVED STPS
XVC-8992B	SI	HI HD HOT LEG LOOP B CHECK 2" CHECK VALVE	A/C / 1	114E075 (1)	I-4	--	--	CV	YES J-7	RS	PENET 415 ISOL VALVE
								LT	NO	N/A	APPROVED STPS

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8992C	SI	HI HD HOT LEG LOOP C 2" CHECK VALVE	A/C 1	114E075 (1)	I-3	--	--	CV LT	YES J-7 NO	RS N/A	PENET 415 ISOL VALVE APPROVED STPS
XVG-8945A	SI	BORON INJ RECIRC HDR ISOL 1" AIR OPERATED VALVE	B 2a	114E075 (1)	F-12	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-8945B	SI	BORON INJ RECIRC HDR ISOL 1" AIR OPERATED VALVE	B 2a	114E075 (1)	F-12	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-8942	SI	BORON INJ RECIRC OUTLET HDR ISOL 1" AIR OPERATED VALVE	B 2a	114E075 (1)	D-11	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVG-8803A	SI	BORON INJ TK INLET 3" MOTOR OPERATED VALVE	B 2a	114E075 (1)	C-11	NC	YES	FS	YES J-14	CS	STROKE TIME 10 SEC APPROVED STP
XVG-8803B	SI	BORON INJ TK INLET 3" MOTOR OPERATED VALVE	B 2a	114E075 (1)	B-11	NC	YES	FS	YES J-14	CS	STROKE TIME 10 SEC APPROVED STP
XVG-8961	SI	ACCUM TEST LINE TO RWST (ORC) 3/4" AIR OPERATED VALVE	A 2a	114E075 (2)	I-12	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 40 SEC PENET 321 ISOL VALVE APPROVED STPS
XVG-8871	SI	ACCUM TEST LINE TO RWST (IRC) 3/4" AIR OPERATED VALVE	A 2a	114E075 (2)	I-11	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 40 SEC PENET 321 ISOL VALVE APPROVED STPS

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8948A	SI	SI OUTLET HDR CK TO RCS LOOP A 12" CHECK VALVE	A/C 1	114E075 (2)	I-13	--	--	CV	YES J-8	RS	APPROVED STPS
								LT	NO	N/A	
XVC-8948B	SI	SI OUTLET HDR CK TO RCS LOOP B 12" CHECK VALVE	A/C 1	114E075 (2)	F-13	--	--	CV	YES J-8	RS	APPROVED STPS
								LT	NO	N/A	
XVC-8948C	SI	SI OUTLET HDR CK TO RCS LOOP C 12" CHECK VALVE	A/C 1	114E075 (2)	D-13	--	--	CV	YES J-8	RS	APPROVED STPS
								LT	NO	N/A	
XVC-8956A	SI	SI ACCUM A OUTLET HDR 12" CHECK VALVE	A/C 1	114E075 (2)	I-11	--	--	CV	YES J-8	RS	APPROVED STPS
								LT	NO	N/A	
XVC-8956B	SI	SI ACCUM B OUTLET HDR 12" CHECK VALVE	A/C 1	114E075 (2)	F-11	--	--	CV	YES J-8	RS	APPROVED STPS
								LT	NO	N/A	
XVC-8956C	SI	SI ACCUM C OUTLET HDR 12" CHECK VALVE	A/C 1	114E075 (2)	D-11	--	--	CV	YES J-8	RS	APPROVED STPS
								LT	NO	N/A	
XVG-8808A	SI	SI ACCUM A OUTLET 12" MOTOR OPERATED VALVE	B 2a	114E075 (2)	I-8	NO	YES	FS	YES J-9	CS	STROKE TIME 15 SEC APPROVED STP
XVG-8808B	SI	SI ACCUM B OUTLET 12" MOTOR OPERATED VALVE	B 2a	114E075 (2)	F-8	NO	YES	FS	YES J-9	CS	STROKE TIME 15 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-8808C	SI	SI ACCUM C OUTLET 12" MOTOR OPERATED VALVE	B / 2a	114E075 (2)	D-8	NO	YES	FS	YES J-9	CS	STROKE TIME 15 SEC APPROVED STP
XVC-8947	SI	N2 SUPPLY TO ACCUM (IRC) 1" CHECK VALVE	A/C / 2a	114E075 (2)	J-3	--	--	CV	NO	N/A	PENET 320 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-8880	SI	N2 SUPPLY TO ACCUM (ORC) 1" AIR OPERATED VALVE	A / 2a	114E075 (2)	J-2	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 320 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8861	SI	ACCUM FILL HDR ISOL (IRC) 1" CHECK VALVE	A/C / 2a	114E075 (2)	D-3	--	--	CV	NO	N/A	PENET 317 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVT-8860	SI	ACCUM FILL HDR ISOL (ORC) 1" AIR OPERATED	A / 2a	114E075 (2)	D-2	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 317 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8974A	SI	SI HDR A CHECK (IRC) 10" CHECK VALVE	A/C / 2a	114E075 (3)	F-12	--	--	CV	YES J-11	CS	PENET 322 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-8974B	SI	SI HDR B CHECK (IRC) 10" CHECK VALVE	A/C / 2a	114E075 (3)	E-12	--	--	CV	YES J-11	CS	PENET 227 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST RFQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8973A	SI	SI TO RCS COLD LEG LOOP A HDR CHECK 6" CHECK VALVE	A/C 2a	114E075 (3)	F-13	--	--	CV	YES J-11	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8973B	SI	SI TO RCS COLD LEG LOOP B HDR CHECK 6" CHECK VALVE	A/C 1	114E075 (3)	F-13	--	--	CV	YES J-11	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8973C	SI	SI TO RCS COLD LEG LOOP C HDR CHECK 6" CHECK VALVE	A/C 1	114E075 (3)	E-13	--	--	CV	YES J-11	CS	APPROVED STPS
								LT	NO	N/A	
XVC-8958A	SI	RH PUMP A SUCTION HDR CHECK 14" CHECK VALUE	C 2a	114E075 (3)	F-4	--	--	CV	NO	N/A	APPROVED STP
XVC-8958B	SI	RH PUMP B SUCTION HDR CHECK 14" CHECK VALVE	C 2a	114E075 (3)	E-4	--	--	CV	NO	N/A	APPROVED STP
XVG-8811A	SI	CONT SUMP TO RHR PP A SUCTION ISOL (IRC) 14" MOTOR OPERATED VALVE	A 2a	114E075 (3)	B-9	NC	YES	FS	NO	N/A	STROKE TIME 17.1 SEC PENET 321 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-8811B	SI	CONT SUMP TO RHR PP B SUCTION ISOL (IRC) 14" MOTOR OPERATED VALVE	A 2a	114E075 (3)	C-9	NC	YES	FS	NO	N/A	STROKE TIME 17.1 SEC PENET 425 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-8812A	SI	RH PP A SUCT FROM SUMP 14" MOTOR OPERATED VALVE	B 2a	114E075 (3)	B-9	NC	YES	FS	NO	N/A	STROKE TIME 17 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-8812B	SI	RH PP A SUCT FROM SUMP 14" MOTOR OPERATED VALVE	B / 2a	114E075 (3)	C-9	NC	YES	FS	NO	N/A	STROKE TIME 17 SEC APPROVED STP
XVC-8926	SI	RWST SUPP TO CHG PPS HDR CHK 8" CHECK VALVE	C / 2a	114E075 (3)	G-3	--	--	CV	YES J-12	RS	APPROVED STP
XVG-8888A	SI	RHR PUMP LOW HEAD SI DISCH ISOLATION 10" MOTOR OPERATED VLV	B / 2a	114E075 (3)	F-12	NO	YES	FS	YES J-17	CS	STROKE TIME 12.2 SEC PENET 322 ISOL APPROVED STP
XVG-8888B	SI	RHR PUMP LOW HEAD SI DISCH ISOLATION 10" MOTOR OPERATED VLV	B / 2a	114E075 (3)	E-12	NO	YES	FS	YES J-17	CS	STROKE TIME 12.2 SEC PENET 227 ISOL APPROVED STP
XVG-8889	SI	RHR DISCH TO HOT LEG RECIRC CONT ISOLATION 10" MOTOR OPERATED VLV	B / 2a	114E075 (3)	H-12	NC	YES	FS	NO	N/A	STROKE TIME 12.2 SEC PENET 325 ISOL APPROVED STP
XVG-8809A	SI	RHR LOW HEAD SI SUCT FROM RWST 14" MOTOR OPERATED VLV	B / 2a	114E075 (3)	F-4	NO	YES	FS	YES J-18	CS	STROKE TIME 17 SEC APPROVED STP
XVG-8809B	SI	RHR LOW HEAD SI SUCT FROM RWST 14" MOTOR OPERATED VALVE	B / 2a	114E075 (3)	E-4	NO	YES	FS	YES J-18	CS	STROKE TIME 17 SEC APPROVED STP
XVC-8940A	SI	BORON INJECT RECIR PUMP A DISCHARGE CHECK VALVE	C / 2a	114E0-75 (1)	E-9	--	--	CV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8940B	SI	BORON INJECT RECIRC PUMP B DISCHARGE CHECK VALVE	C / 2a	114E075 (1)	D-9	--	--	CV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-3003A	SP	SPRAY HDR A ISOL 10" MOTOR OPERATED VALVE	A / 2a	302-661	E-10	NC	YES	FS LT	NO NO	N/S N/A	STROKE TIME 30 SEC PENET 401 ISOL VALVE APPROVED STPS
XVC-3009A	SP	SPRAY HDR A CHECK VALVE INSIDE Rx BLDG 10" CHECK VALVE	A/C / 2a	302-661	E-11	--	--	CV LT	YES K-1 NO	RS N/A	PENET 401 ISOL VALVE APPROVED STPS
XVG-3003B	SP	SPRAY HDR B ISOL 10" MOTOR OPERATED VALVE	A / 2a	302-661	E-10	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 30 SEC PENET 303 ISOL VALVE APPROVED STPS
XVC-3009B	SP	SPRAY HDR B 10" CHECK VALVE INSIDE Rx BLDG	A/C / 2a	302-661	E-11	--	--	CV LT	YES K-1 NO	RS N/A	PENET 303 ISOL VALVE APPROVED STPS
XVG-3004A	SP	Rx BLDG SPRAY SUMP ISOL VALVE A INSIDE 12" MOTOR OPERATED VALVE	A / 2a	302-661	F-10	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 75 SEC PENET 327 ISOL VALVE APPROVED STPS
XVG-3004B	SP	Rx BLDG SPRAY SUMP ISOL VALVE B INSIDE 12" MOTOR OPERATED VALVE	A / 2a	302-661	H-10	NC	YES	FS LT	NO NO	N/A N/A	STROKE TIME 75 SEC PENET 328 ISOL VALVE APPROVED STPS
XVG-3005A	SP	RB SPRAY SUMP ISOL VALVE A OUTSIDE 12" MOTOR OPERATED VALVE	B / 2a	302-661	F-9	NC	YES	FS	NO	N/A	STROKE TIME 62 SEC APPROVED STP
XVG-3005B	SP	RB SPRAY SUMP ISOL VALVE B OUTSIDE 12" MOTOR OPERATED VALVE	B / 2a	302-661	H-9	NC	YES	FS	NO	N/A	STROKE TIME 62 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-3001A	SP	RWST TO SPRAY PP SUCTION A 12" MOTOR OPERATED VALVE	B / 2a	302-661	D-4	NO	YES	FS	NO	N/A	STROKE TIME 15 SEC APPROVED STP
XVG-3001B	SP	RWST TO SPRAY PP SUCTION A 12" MOTOR OPERATED VALVE	B / 2a	302-661	E-3	NO	YES	FS	NO	N/A	STROKE TIME 15 SEC APPROVED STP
XVC-3006A	SP	RWST TO SPRAY PP SUCTION 12" CHECK VALVE	C / 2a	302-661	D-4	--	--	CV	NO	N/A	APPROVED STP
XVC-3006B	SP	RWST TO SPRAY PP SUCTION 12" CHECK VALVE	C / 2a	302-661	E-3	--	--	CV	NO	N/A	APPROVED STP
XVC-3013A	SP	NaOH TO SPRAY PP SUCTION 3" CHECK VALVE	C / 2a	302-661	F-4	--	--	CV	YES K-3	RS	APPROVED STP
XVC-3013B	SP	NaOH TO SPRAY PP SUCTION 3" CHECK VALVE	C / 2a	302-661	F-4	--	--	CV	YES K-3	RS	APPROVED STP
XVG-3002A	SP	NaOH TO SPRAY PP A SUCTION 3" MOTOR OPERATED VALVE	B / 2b	302-661	G-3	NC	YES	FS	YES K-2	CS	STROKE TIME 15 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-3002B	SP	NaOH TO SPRAY PP B SUCTION 3" MOTOR OPERATED VALVE	B / 2b	302-661	H-3	NC	YES	FS	YES K-2	CS	STROKE TIME 15 SEC APPROVED STP
XVV-3014A	SP	NaOH STORAGE TANK VACUUM BREAKER A	C / 2b	302-661	D-2	NC	NO	FS	NO	N/A	APPROVED STP
XVV-3014B	SP	NaOH STORAGE TANK VACUUM BREAKER B	C / 2b	302-661	D-2	NC	NO	FS	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVA-9311A	SS	AIR HANDLING RAD MONITOR INSIDE SUCTION 1" AIR OPERATED VALVE	A 2a	302-771	D-13	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 407 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVA-9311B	SS	AIR HANDLING RAD MONITOR OUTSIDE SUCTION 1" AIR OPERATED VALVE	A 2a	302-771	D-14	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 407 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVA-9312A	SS	RAD MONITOR SAMPLE RETURN INSIDE 1" AIR OPERATED VALVE	A 2a	302-771	E-13	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 407 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVA-9312B	SS	RAD MONITOR SAMPLE RETURN OUTSIDE 1" AIR OPERATED VALVE	A 2a	302-771	E-14	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 407 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9356A	SS	STEAM SPACE HDR ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	C-12	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 405 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9356B	SS	LIQUID SPACE HDR ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	C-12	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 405 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9357	SS	PZR SAMPLE CONTAINMENT ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	C-10	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 405 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9364B	SS	LOOP B CONTAINMENT SAMPLE ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	D-11	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 314 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVM-9365B	SS	LOOP B CONTAINMENT SAMPLE ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	D-10	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 314 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9364C	SS	LOOP C CONTAINMENT SAMPLE ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	E-11	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 223 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9365C	SS	LOOP C CONTAINMENT SAMPLE ISOL 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	E-10	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 223 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVM-9398A	SS	S/G A SAMPLE CONTAINMENT ISOL VALVE 3/8" SOLENOID OPERATED VALVE	B 2a	302-771	F-10	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 411 ISOL VALVE APPROVED STP
XVM-9398B	SS	S/G B SAMPLE CONTAINMENT ISOL VALVE 3/8" SOLENOID OPERATED VALVE	B 2a	302-771	G-10	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 225 ISOL VALVE APPROVED STP
XVM-9398C	SS	S/G C SAMPLE CONTAINMENT ISOL VALVE 3/8" SOLENOID OPERATED VALVE	B 2a	302-771	H-10	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 220 ISOL VALVE APPROVED STP
XVM-9387	SS	ACCUM SAMPLE CONT ISOL VALVE 3/8" SOLENOID OPERATED VALVE	A 2a	302-771	J-10	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 323 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVT-9339	SS	POST ACCIDENT SAMPLING RETURN HDR ISOLATION (IRC) 3/8" SOLENOID OPERATED VALVE	A 2a	302-772	J-3	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 417 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVT-9341	SS	POST ACCIDENT SAMPLING RETURN HEADER ISOL (ORC)	A / 2a	302-772	J-3	NC	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 417 ISOL APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-3119A	SW	SERV WATER SUPP TO A D/G GEN CLR 8" CHECK VALVE	C / 2b	302-222	B-10	--	--	CV	NO	N/A	APPROVED STP
XVC-3119B	SW	SERV WATER SUPP TO B D/G GEN CLR 8" CHECK VALVE	C / 2b	302-222	J-10	--	--	CV	NO	N/A	APPROVED STP
XVC-3135A	SW	16" CHECK VALVE	C / 2b	302-222	C-5	--	--	CV	NO	N/A	APPROVED STP
XVC-3135B	SW	16" CHECK VALVE	C / 2b	302-222	G-5	--	--	CV	NO	N/A	APPROVED STP
XVB-3106A	SW	SW BOOSTER PP A DISCH 16" MOTOR OPERATED VALVE	A / 2a	302-222	C-5	NO	YES	FS	NO	N/A	STROKE TIME 60 SEC PENET 304 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVB-3106B	SW	SW BOOSTER PUMP B DISCH 16" MOTOR OPERATED VALVE	A / 2a	302-222	G-5	NC	YES	FS	NO	N/A	STROKE TIME 60 SEC PENET 403 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVB-3110A	SW	12" MOTOR OPERATED VALVE	A / 2a	302-222	B-5	NO	YES	FS	NO	N/A	STROKE TIME 60 SEC PENET 304 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVB-3110B	SW	12" MOTOR OPERATED VALVE	A / 2a	302-222	H-5	NO	YES	FS	NO	N/A	STROKE TIME 60 SEC PENET 403 ISOL VALVE APPROVED STPS
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-3137A	SW	16" CHECK VALVE	A/C 2a	302-222	C-4	--	--	CV	NO	N/A	PENET 304 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVC-3137B	SW	16" CHECK VALVE	A/C 2a	302-222	G-4	--	--	CV	NO	N/A	PENET 403 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-3103A	SW	16" MOTOR OPERATED VALVE	A 2a	302-222	C-2	NO	YES	FS	NO	N/A	STROKE TIME 75 SEC PENET 305 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-3103B	SW	16" MOTOR OPERATED VALVE	A 2a	302-222	G-2	NO	YES	FS	NO	N/A	STROKE TIME 75 SEC PENET 102 ISOL VALVE APPROVED STPS
								LT	NO	N/A	
XVG-3111A	SW	12" MOTOR OPERATED VALVE	B 2b	302-222	B-2	NO	YES	FS	NO	N/A	STROKE TIME 62 SEC APPROVED STP
XVG-3111B	SW	12" MOTOR OPERATED VALVE	B 2b	302-222	F-2	NO	YES	FS	NO	N/A	STROKE TIME 62 SEC APPROVED STP
XVT-3164	SW	DRPI COOLING HDR INLET ISOL 2" AIR OPERATED	B 2b	302-222	F-14	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVT-3169	SW	DRPI COOLING HDR OUTLET ISOL 2" AIR OPERATED	B 2b	302-222	J-14	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-3115A	SW	SERV WATER PUMP A DISCH CK 24" CHECK VALVE	C / 2b	302-221	F-2	--	--	CV	NO	N/A	APPROVED STP
XVC-3115B	SW	SERV WATER PUMP B DISCH CK 24" CHECK VALVE	C / 2b	302-221	F-10	--	--	CV	NO	N/A	APPROVED STP
XVC-3115C	SW	SERV WATER PUMP C DISCH CK 24" CHECK VALVE	C / 2b	302-221	G-6	--	--	CV	NO	N/A	APPROVED STP
XVB-3116A	SW	SERV WATER PUMP A DISCH ISOL 24" MOTOR OPERATED VALVE	B / 2b	302-221	G-2	OPEN AUTO	YES	FS	NO	N/A	STROKE TIME 60 SEC APPROVED STP
XVB-3116B	SW	SERV WATER PUMP A DISCH ISOL 24" MOTOR OPERATED VALVE	B / 2b	302-221	G-10	OPEN AUTO	YES	FS	NO	N/A	STROKE TIME 60 SEC APPROVED STP
XVB-3116C	SW	SERV WATER PUMP C DISCH ISOL 24" MOTOR OPERATED VALVE	B / 2b	302-221	G-6	OPEN AUTO	YES	FS	NO	N/A	STROKE TIME 60 SEC APPROVED STP
XVT-3165	SW	DRPI COOLING HDR ISOL 2" AIR OPERATED	B / 2b	302-222	F-14	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVB-3128A	SW	SW A TO HVAC CHILLER COND. B 6" MOTOR OPERATED	B / 2b	302-222	D-11	NO	YES	FS	NO	N/A	STROKE TIME 15 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-3108A	SW	RB COOLING UNIT 1A INLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	B-4	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3108B	SW	RB COOLING UNIT 2A INLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	D-4	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3108C	SW	RB COOLING UNIT 2A INLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	F-4	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3108D	SW	RB COOLING UNIT 2B INLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	H-4	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3109A	SW	RB COOLING UNIT 1A OUTLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	B-3	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3109B	SW	RB COOLING UNIT 2A OUTLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	D-31	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3109C	SW	RB COOLING UNIT 1B OUTLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	F-3	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP
XVG-3109D	SW	RB COOLING UNIT 2B OUTLET ISOL 10" MOTOR OPERATED	B / 2b	302-222	H-3	NO	YES	FS	NO	N/A	STROKE TIME 50 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVB-3128C	SW	SW A TO HVAC CHILLER COND. C 6" MOTOR OPERATED	B / 2b	302-2[illegible]	E-[illegible]	[illegible]	YES	FS	NO	N/A	STROKE TIME 15 SEC APPROVED STP
XVG-3107A	SW	SW POND RBCU 1A & 2A RETURN ISOLATION VALVE 16" MOTOR OPERATED	B / 2b	302-222	C-1	NC	YES	[illegible]	YES L-1	CS	STROKE TIME 75 SEC APPROVED STP
XVG-3107B	SW	SW POND RBCU 1B & 2B RETURN ISOLATION VALVE 16" MOTOR OPERATED	B / 2b	302-222	G-1	NC	YES	FS	YES L-1	CS	STROKE TIME 75 SEC APPROVED STP
XVG-3112A	SW	RBCU 1A & 2A CI SYSTEM RETURN VALVE 12" MOTOR OPERATED	B / 2b	302-222	B-2	NO	YES	FS	NO	N/A	STROKE TIME 62 SEC APPROVED STP
XVG-3112B	SW	RBCU 1B & 2B CI SYSTEM RETURN VALVE 12" MOTOR OPERATED	B / 2b	302-222	E-2	NO	YES	FS	NO	N/A	STROKE TIME 62 SEC APPROVED STP
XVC-3130A	SW	SW POND SW RETURN HDR A INLET CHECK VLV 30" CHECK VALVE	C / 2b	302-222	A-6	-	-	CV	NO	N/A	APPROVED STP
XVC-3130B	SW	SW POND SW RETURN HDR B INLET CHECK VLV 30" CHECK VALVE	C / 2b	302-222	J-7	-	-	CV	NO	N/A	APPROVED STP
XVB-3126A	SW	HVAC CHILLER CONDENSER A SW SUPPLY VALVE 6" MOTOR OPERATED	B / 2b	302-222	D-11	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVB-3126B	SW	HVAC CHILLER CONDENSER B SW SUPPLY VALVE 6" MOTOR OPERATED	B / 2b	302-222	F-11	NO	YES	FS	NO	N/A	STROKE TIME 30 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
MVT-6412A	VU	A CHILLED WTR TO CB NON-ESS 3" AIR OPERATED VALVE	B / 2b	302-842	E-12	NO	YES	FS	NO	N/A	STROKE TIME 5 SEC APPROVED STP
MVT-6490A	VU	A CHILLED WTR TO CB NON-ESS 3" AIR OPERATED VALVE	B / 2b	302-842	E-12	NO	YES	FS	NO	N/A	STROKE TIME 5 SEC APPROVED STP
MVT-6385A	VU	A CHILLED WATER TO NON-ESS 2" AIR OPERATED	B / 2b	302-842	G-3	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
MVT-6384A	VU	A CHILLED WTR TO IB NON-ESS 2" AIR OPERATED	B / 2b	302-842	G-3	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
MVT-6412B	VU	B CHILLED WTR TO CB NON-ESS 3" AIR OPERATED	B / 2b	302-843	C-13	NO	YES	FS	NO	N/A	STROKE TIME 5 SEC APPROVED STP
MVT-6490B	VU	B CHILLED WTR TO CB NON-ESS 3" AIR OPERATED VALVE	B / 2b	302-843	C-12	NO	YES	FS	NO	N/A	STROKE TIME 5 SEC APPROVED STP
XVT-6384B	VU	B CHILLED WTR TO IB NON-ESS 2" AIR OPERATED VALVE	B / 2b	302-843	G-3	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP
XVT-6385B	VU	B CHILLED WTR TO IB NON-ESS 2" AIR OPERATED VALVE	B / 2b	302-843	H-3	NO	YES	FS	NO	N/A	STROKE TIME 10 SEC APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-6516	VU	A LOOP CHILLED WATER TO "A" COMP COOLING WTR PUMP MOTOR COOLER	B / 3	302-842	H-14	NO	YES	FS	NO	N/A	STROKE TIME 7.5 SEC APPROVED STP
XVG-6517	VU	B LOOP CHILLED WATER TO "B" COMP COOLING WTR PUMP MOTOR COOLER	B / 3	302-842	J-13	NC	YES	FS	NO	N/A	STROKE TIME 7.5 SEC APPROVED STP
XVG-6518	VU	A LOOP CHILLED WATER TO "C" COMP COOLING WTR PUMP MOTOR COOLER	B / 3	302-843	J-12	NC	YES	FS	NO	N/A	STROKE TIME 7.5 SEC APPROVED STP
XVG-6519	VU	B LOOP CHILLED WATER TO "B" COMP COOLING WTR PUMP MOTOR COOLER	B / 3	302-843	J-11	NC	YES	FS	NO	N/A	STROKE TIME 7.5 SEC APPROVED STP
XVC-6410A	VU	NON ESS EQUIP OUT VU RET HDR A CHECK VLV	C / 2b	302-842	F-8	--	--	CV	NO	N/A	APPROVED STP
XVC-6410B	VU	NON ESS EQUIP OUT VU RET HDR B CHECK VLV	C / 2b	302-843	C-8	--	--	CV	NO	N/A	APPROVED STP
XVC-6489A	VU	NON ESS EQUIP OUT VU RET HDR A CHECK VLV	C / 2b	302-842	E-8	--	--	CV	NO	N/A	APPROVED STP
XVC-6489B	VU	NON ESS EQUIP OUT VU RET HDR B CHECK VLV	C / 2b	302-843	C-8	--	--	CV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-6387A	VU	NON ESS EQUIP OUT VU RET HDR A CHECK VLV	C / 2b	302-842	H-7	--	--	CV	NO	N/A	APPROVED STP
XVC-6387B	VU	NON ESS EQUIP OUT VU RET HDR B CHECK VLV	C / 2b	302-843	H-7	--	--	CV	NO	N/A	APPROVED STP
XVC-6388A	VU	NON ESS EQUIP OUT VU RET HDR A CHECK VLV	C / 2b	302-842	H-7	--	--	CV	NO	N/A	APPROVED STP
XVC-6388B	VU	NON ESS EQUIP OUT VU RET HDR B CHECK VLV	C / 2b	302-843	H-7	--	--	CV	NO	N/A	APPROVED STP
XVC-6461A	VU	CHILL WTR PUMP 151A DISCH CHECK 6" CHECK VALVE	C / 2b	302-841	E-10	--	--	CV	NO	N/A	APPROVED STP
XVC-6461B	VU	CHILL WTR PUMP 151B DISCH CHECK 6" CHECK VALVE	C / 2b	302-841	E-5	--	--	CV	NO	N/A	APPROVED STP
XVC-6461C	VU	CHILL WTR PUMP 151C DISCH CHECK 6" CHECK VALVE	C / 2b	302-841	E-7	--	--	CV	NO	N/A	APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVD-7126	WL	RCDT VENT TO WG SYSTEM ISOL (IRC) 3/4" AIR OPERATED VALVE	A / 2a	114E077 (1)	H-11	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 418 ISOL VALVE APPROVED STP
								LT	NO	N/A	
XVD-7150	WL	RCDT VENT TO WG SYSTEM ISOL (ORC) 3/4" AIR OPERATED VALVE	A / 2a	114E077 (1)	I-10	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 418 ISOL VALVE APPROVED STP
								LT	NO	N/A	
XVD-7136	WL	RCDT DISCH HDR ISOL (ORC) 3" AIR OPERATED VALVE	A / 2a	114E077 (1)	H-3	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 423 ISOL VALVE APPROVED STP
								LT	NO	N/A	
LCV-1003	WL	RCDT LEVEL CONTROL VALVE 3" AIR OPERATED VALVE	A / 2a	114E077 (1)	H-4	NO	YES	FS	NO	N/A	STROKE TIME 40 SEC PENET 423 ISOL APPROVED STP
								LT	NO	N/A	

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-7541	AC	XVT-7502 BYPASS CHECK 3/4" CHECK VALVE	A/C / 2a	D-302-852	D-11	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP
XVC-7544	AC	XVT-7503 BYPASS CHECK 3/4" CHECK VALVE	A/C / 2a	D-302-852	D-11	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-9689	CC	XVG-9605 BYPASS 3/4" CHECK VALVE	A/C / 2b	D-302-612	G-11	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8103	CS	RCP SEAL RETURN ISOL BYPASS 3/4" CHECK VALVE	A/C / 2a	114E073 (1)	H-2	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVD-8767	DN	DW HEADER SUPP ISOL VALVE 1" MANUAL	A / 2a	302-715	D-10	NC	NO	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVD-8768	DN	RB DW SUPP ISOL VLV 1" MANUAL	A / 2a	302-715	D-11	NC	NO	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVX-6051A	HR	RB SAMPLE TO H2 ANAL A 3/8" SOLENOID OP. VLV.	A / 2a	302-861	B-12	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6051C	HR	RB SAMPLE TO H2 ANAL A 3/8" SOLENOID OP. VLV.	A / 2a	302-861	A-11	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6053A	HR	POST ACC H2 SUPP ISOL LOOP A 3/8" SOLENOID OP. VLV.	A / 2a	302-861	B-10	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6052A	HR	POST ACC H2 RETURN ISOL VLV. 3/8" SOLENOID OP. VLV.	A / 2a	302-861	C-10	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6051B	HR	POST ACC H2 RETURN ISOL VLV. 3/8" SOLENOID OP. VLV.	A / 2a	302-861	E-12	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6050B	HR	POST ACC H2 RETURN ISOL. VLV. 3/8" SOLENOID OP. VLV.	A / 2a	302-861	F-12	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6053B	HR	POST ACC H2 SUPPLY ISOL. LOOP A 3/8" SOL OP. VLV.	A / 2a	302-861	E-10	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVX-6052B	HR	POST ACC H2 SUPPLY ISOL LOOP A 3/8" SOL. OP. VLV	A / 2a	302-861	E-10	NC	YES	LT	YES P-1	APP. J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVT-2680	IA	RB BREATH AIR SUPPLY HEADER ISOL 2" MANUAL	A / 2a	302-274	C-4	LC	NO	LT	YES P-1	APP J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP
XVT-2679	IA	OUT CNTMT BREATH AIR SUPPLY ISOL. 2" MANUAL	A / 2a	302-274	D-4	LC	NO	LT	YES P-1	APP J	CAT A PASSIVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVG-6587	NG	NITROGEN SUPPLY HDR VALVE (ORC)	A / 2a	302-311	B-12	NC	--	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP
XVC-6588	NG	NITROGEN SUPPLY HDR CHECK VALVE (IRC)	A / 2a	302-311	B-13	NC	--	LT	YES P-1	APP J	CATEGORY A PASSIVE/C LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-8703A	RH	XVG-8702A BYPASS CHECK 3/4" CHECK VALVE	A/C / 2a	114E074	C-12	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP
XVC-8703B	RH	XVG-8702A BYPASS CHECK 3/4" CHECK VALVE	A/C / 2a	114E074	E-12	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP
XVG-8702A	RH	RHR LOOP A SUCTION ISOLATION 12" MOTOR OPERATOR VALVE	A / 2a	114E074	C-12	NC	YES	LT	YES P-1	APP J	CAT A PASSIVE VALVE LEAK TEST ONLY APPROVED STP
XVG-8702B	RH	RHR LOOP B SUCTION ISOLATION 12" MOTOR OPERATOR VALVE	A / 2a	114E074	E-12	NC	YES	LT	YES P-1	APP J	CAT A PASSIVE VALVE LEAK TEST ONLY APPROVED STP
XVG-8701A	RH	RHR LOOP A SUCTION HDR ISOLATION 12" MOTOR OPERATED VALVE	A / 1	114E074	C-12	NC	YES	LT	YES P-1	TECH. SPECS.	CAT A PASSIVE VALVE LEAK TEST ONLY APPROVED STP
XVG-8701B	RH	RHR LOOP B SUCTION HDR ISOLATION 12" MOTOR OPERATED VALVE	A / 1	114E074	E-12	NC	YES	LT	YES P-1	TECH. SPECS.	CAT A PASSIVE VALVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-2913	SA	RB SA HDR CHECK VALVE 2" CHECK VALVE	A/C / 2a	302-241	B-11	--	--	LT	YES P-1	APP J	CAT A PASSIVE/C VALVE LEAK TEST ONLY APPROVED STP
XVT-2912	SA	RB SA HDR ISOL VALVE 2" MANUAL VALVE	A / 2a	302-241	B-10	NC	NO	LT	YES P-1	APP J	CAT A PASSIVE VALVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVD-6671	SF	RF CAVITY PURIFICATION ISOL VLV (IRC) 3" MANUAL	A / 2a	302-651	H-12	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP
XVD-6672	SF	RF CAVITY SF PUR SUPP ISOL VLV (ORC) 3" MANUAL	A / 2a	302-651	G-12	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP
XVD-6697	SF	SF PUR HEADER RF CAVITY ISOL VLV (ORC) 3" MANUAL	A / 2a	302-651	G-12	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP
XVD-6698	SF	RF CAVITY SF PUR HDR ISOL VLV (IRC) 3" MANUAL	A / 2a	302-651	H-12	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVD-7135	WL	RCDT H/X BYPASS VLV 3" MANUAL	A / 2a	114E077	H-3	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP

VALVE NUMBER	SYS.	VALVE DESCRIPTION	VALVE CAT/CLS	DRAWING NUMBER	CO-ORD	NORM POS (NOTE #1)	POS IND (NOTE #2)	TEST REQ'MENT (NOTE #3)	RELIEF REQUEST (NOTE #4)	ALTERNATE TEST (NOTE #5)	REMARKS (NOTE #6)
XVC-6799	FS	FS TO XAA-4A & B HDR CHECK 4" CHECK VALVE	A/C / 2a	302-231	D-6	--	-	LT	YES P-1	APP J	CATEGORY A PASSIVE/C LEAK TEST ONLY APPROVED STP
XVG-6772	FS	FS SUPPLY HEADER TO INLET ISOLATION "4" MANUAL (ORC)	A / 2a	302-231	D-6	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP
XVG-6773	FS	RB FS HEADER ISOL VLV 4" MANUAL (IRC)	A / 2a	302-231	D-6	LC	NO	LT	YES P-1	APP J	CATEGORY A PASSIVE LEAK TEST ONLY APPROVED STP

A. SYSTEMS

1. AC - CRDM Cooling Water System
2. AH - Ventilation Systems
3. BD - Steam Generator Blowdown System
4. CC - Component Cooling Water System
5. CS - Chemical and Volume Control System
6. DG - Diesel Generator System
7. EF - Emergency Feedwater System
8. FW - Feedwater System
9. FS - Fire Service System
10. HR Accident Hydrogen Removal System
11. IA Instrument Air System
12. MS - Main Steam System
13. ND - Reactor & Auxiliary Building Sump Pumps
14. NG - Nitrogen Blanketing System
15. RC - Reactor Coolant System
16. RH - Residual Heat Removal System
17. SA - Station Air System
18. SI - Safety Injection System
19. SP - Reactor Building Spray System
20. SS - Nuclear Sampling System
21. SW - Service Water System
22. VU - Chilled Water System
23. WL - Waste Processing System

VALVE LIST NOTES

NOTE 1 Normal Position - indicates the position of the valve, NO or NC, during plant operation.

NOTE 2 Position Indication - a Yes in this column indicates that the valve has remote position indication.

NOTE 3 Test Requirement - indicates those required test to a valve as listed in ASME code Section XI, Subsection IWV.

NOTE 4 Relief Request - indicate whether or not relief has been requested. If a "Yes" appears in this column, it will be followed by a A-1, B-1, etc.; which indicates the relief request number in the relief request binder.

NOTE 5 Alternate Test - if relief has been requested, the alternate test will be listed in this column.

NOTE 6 Remarks - the stroke times listed here are the maximum stroke time for the applicable valves.

* The stroke times with this indicator are the suggested maximum times, if exceeded, the ISI coordinator will determine operational readiness of the valves.

CATEGORY C: SAFETY AND RELIEF VALVES
Testing Schedule

Time Period	Number of Valves to be Tested
Startup through first refueling	Minimum of $\frac{N_1^1}{60}$ x total valves in this category.
First refueling through second refueling	Additional valves to make cumulative tested at least $\frac{N_2^1}{60}$ x total valves in this category
Second refueling through third refueling	Additional valves to make cumulative tested at least $\frac{N_3^1}{60}$ x total valves in the category
etc.	etc.

[1] N_1, N_2, N_3, etc., equal number of months from startup to first refueling, second refueling, third refueling, etc. When N is a number larger than 60, all valves which have not been tested during the preceding five year period shall be tested. The following period shall then be considered to be the same as "startup to first refueling" for purposes of determining test frequency, with the added requirement that at each refueling all valves which have not been tested during the preceding five year period shall be tested. Subsequent period will be considered the same as first refueling to second refueling, etc., with N determined by counting months from the new starting point.

VALVE TEST SUMMARY

VALVE NUMBER	DATE OF SUCCESSFUL TEST									
	INIT	DATE	INIT	DATE	INIT	DATE	INIT	DATE	INIT	DATE

LIST OF APPLICABLE STPS

STP-104.005 - Boric Acid Transfer Pump Test
STP-105.001 - Charging/SI Pump Test
STP-105.002 - Charging System Valve Operability Test
STP-105.003 - Safety Injection Valve Operability Test
STP-105.005 - RHR System Valve Operability Test
STP-112.002 - RB Spray Pump Test
STP-120.001 - EFWP Test (Electric Pump)
STP-120.002 - EFWP Test (Turbine Driven)
STP-112.003 - RB Spray System Valve Operability Test
STP-120.004 - Emergency Feedwater Valve Operability Test
STP-121.002 - Main Steam Valve Operability Test
STP-122.002 - Component Cooling Water Pump Test
STP-122.003 - Component Cooling Valve Operability Test
STP-123.003 - Service Water Valve Operability Test
STP-125.002 - Diesel Generator Operability Test
STP-127.001 - PORV Operability Test
STP-128.013 - Fire Valve Operability Test
STP-129.002 - Chilled Water Valve Operability Test
STP-130.001 - Valve Operability Test (Cooldown and Shutdown)
STP-130.002 - Valve Operability Test (Refueling Shutdown)
STP-136.001 - Steam Generator Blowdown Valve Operability Test
STP-138.001 - Post Accidents H_2 Removal Valve Operability Test
STP-139.001 - Reactor Building Instrument Air Valve Operability Test
STP-140.001 - RB & Auxiliary Building Nuclear Drains Valve Operability Test
STP-142.001 - RCS Valve Operability Test
STP-144.001 - Nuclear Sampling Valve Operability Test
STP-145.001 - Liquid Waste Valve Operability Test
STP-148.001 - Feedwater Valve Operability Test
STP-401.001 - Pressurizer Code Safety ASME XI Test
STP-401.002 - Main Steam Code Safety ASME XI Test
STP-401.003 - Code Relief Valves ASME XI Test

LIST OF APPLICABLE STPS

STP-115.005 - RCS Valve Leakage Test
STP-115.006 - Charging System Valve Leakage Test
STP-115.007 - Safety Injection Valve Leakage Test
STP-115.008 - RHR Valve Leakage Test
STP-115.009 - Waste Processing Valve Leakage Test
STP-115.012 - Service Water Valve Leakage Test
STP-115.013 - Station Air Valve Leakage Test
STP-115.014 - Instrument Air Valve Leakage Test
STP-115.015 - N_2 Blanketing Valve Leakage Test
STP-115.016 - Component Cooling Valve Leakage Test
STP-115.017 - RB Spray Valve Leakage Test
STP-115.018 - Sampling System Valve Leakage Test
STP-115.020 - Nuclear Drains Valve Leakage Test
STP-115.021 - Post Accident Hydrogen Removal Valve Leakage Test
STP-115.022 - RB Purge & Exhaust Valve Leakage Test
STP-115.023 - Fire Protection Valve Leakage Test
STP-115.025 - Demineralized Water Valve Leakage Test
STP-115.026 - Spent Fuel System Valve Leakage Test
STP-115.029 - CRDM Cooling System Leakage Test

SIZE	SUGGESTED APP. J. LIMIT (1) (cc/min)	ALERT LIMIT (2) (cc/min)	SUGGESTED MAX ASME LIMIT (3) (cc/min)
3/8"	450	575	700
3/4"	450	575	700
3"	500	625	750
1"	500	625	750
1-1/2"	500	625	750
2"	500	625	750
4"	500	625	750
6"	675	850	1050
8"	725	925	1125
10"	800	1025	1200
12"	900	1150	1350
14"	900	1150	1350
16"	950	1225	1400
36"	2000	2500	3000

NOTES:

(1) This is the suggested leakage limit in order not to exceed the .6 La limit. Penetration leakage can exceed this limit provided other penetration leakage is below their limit making up the difference and not exceeding the .6 La limit.

(2) The Alert limit is to inform the personnel that the penetration is or could become a problem. If a penetration exceeds the alert limit, but still does not cause exceeding the .6 La limit, the penetration test frequency should be doubled and scheduled to coincide with a cold shutdown until corrective action is taken.

(3) Valves/Penetrations with leakage rates exceeding the suggested maximum ASME limit shall be replaced or repaired.

NOTE: Some valve/penetration leakages are limited by technical specification and do not fall into this category.

REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES LIMITED TO 1 GPM LEAKAGE

VALVE NO.	DESCRIPTION
XVC-8993 A,B,C	SI to Hot Legs
XVC-8992 A,B,C	SI High Head to Hot Legs
XVC-8990 A,B,C	SI High Head to Hot Legs
XVC-8988 A,B	SI Low Head to Hot Legs
XVC-8997 A,B,C	Primary SI High Head to Cold Legs
XVC-8995 A,B,C	Alternate SI High Head to Cold Legs
XVC-8998 A,B,C	SI to Cold Legs
XVC-8973 A,B,C	RHR Low Head to Cold Legs
XVC-8948 A,B,C	Accumulators to Cold Legs
XVC-8956 A,B,C	Accumulators to Cold Legs
XVG-8701 A,B	RHR Suction from Hot Legs
XVG-8702 A,B	RHR Suction from Hot Legs
XVC-8974 A,B	RHR Low Head to Cold Legs

VALVE TEST RELIEF REQUEST INDEX

VALVE TEST RELIEF REQUEST INDEX

VALVE TEST RELIEF REQUEST INDEX

VALVE TEST RELIEF REQUEST INDEX

A. SYSTEM: COMPONENT COOLING WATER SYSTEM (CC)

A.1 Valve: XVC-9570

Category: A/C

Class: 2a

Function: Prevent reverse flow from the reactor containment to the component cooling water system.

Test Requirement: Check valves will be exercised to the positions required to fulfill their function every three (3) months.

Basis for Relief: Testing this valve would require securing cooling water to the reactor coolant pumps. During plant operation this could damage the pumps.

Alternate Test: Valve will be tested during cold shutdown, when the RHR System is in operation and the reactor coolant pumps can be shutdown.

A.2 Valve: XVC-9602

Category: A/C

Class: 2b

Function: Prevent reverse flow from the reactor containment to the component cooling water system.

Test Requirement: Check valves will be exercised to the positions required to fulfill their function every three (3) months.

Basis for Relief: Testing this valve would require securing cooling water to the reactor coolant pumps. During plant operation this could damage the pumps.

Alternate Test: Valve will be tested during cold shutdown, when the RHR System is in operation and the reactor coolant pumps can be shutdown.

A.3 Valve: XVC-9600

Category: A/C

Class: 2b

Function: Isolation component cooling water to the reactor containment from the component cooling water booster pumps.

Test Requirement: Exercise valve (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves would require securing cooling water to the reactor coolant pumps. During plant operation this could damage the pumps.

Alternate Test: Valve will be tested during cold shutdown, when the RHR System is in operation and the reactor coolant pumps can be shutdown.

A.5 Valve: XVG-9605 & 9606 & 9568

Category: A

Class: 2a

Function: Isolation component cooling water to the reactor containment.

Test Requirement: Exercise valve (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves would require securing cooling water to the reactor coolant pumps. During plant operation this could damage the pumps.

Alternate Test: Valve will be tested during cold shutdown.

B. SYSTEM: CHEMICAL AND VOLUME CONTROL SYSTEM (CS)

B.1 Valve: LCV-115C & 115E

Category: B

Class: 2a

Function: Volume control tank outlet header isolation

Test Requirement: Exercise valve (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during plant operations would require shifting charging pump suction from the VCT to the RWST. This would cause an inadvertant boration and plant shutdown.

Alternate Test: Valve will be tested during cold shutdown.

B.2 Valve: XVC-8481A, 8481B and 8481C

Category: C

Class: 2a

Function: Charging pump discharge header check valves

Test Requirement: Check valves will be exercised to the position required to fulfill their function every three (3) months.

Basis for Relief: Exercising these valves during normal operations would require establishing full charging flow into the RCS causing a overpressure condition and possible reactor trips. During cold shutdown, full charging flow would cause a pressure surge and exceed the maximum pressure for the low temperature of the RCS.

Alternate Test: Valve will be partial stoke tested quarterly and full flow exercised each refueling shutdown when the vessel head is removed.

B.7 Valve: XVC-8442

Category: C

Class: 2a

Function: Emergency Borate Check Valve

Test Requirement: Check valves will be exercised to the position required to fulfill their function every three months.

Basis for Relief: Testing this valve during plant operations would inject high concentrated boric acid into the suction of the charging pump causing an inadvertant boration and plant shutdown.

Alternate Test: Valve will be tested during cold shutdown.

B.8 Valve: XVT-8152

Category: A

Class: 2a

Function: Letdown flow containment isolation

Test Requirement: Exercise valve (full stroke) for operability every three (3) months.

Basis for Relief: Testing this valve during plant operation would isolate letdown which could cause thermal shock to charging connection. Could also cause lifting of letdown relief (XVR-8117)

Alternate Test: Valves will be tested during cold shutdown.

VALVE TEST RELIEF REQUESTS

B.9 Valve: XVC-8381

Category: A/C

Class: 2a

Function: Containment isolate check valve for normal charging.

Test Requiremen: Check Valves will be exercised to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing this valve during plant operation would require securing charging and letdown flow which could result in a loss of volume control and pressurizer level causing a reactor trip.

Alternate Test: This valve will be tested during cold shutdown.

B.10 Valve: XVG-8107 & 8108

Category: A

Class: 2a

Function: Isolate charging flow to the containment.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operations would require securing charging and letdown flow, which could result in a loss of volume control and pressurized level causing a reactor trip.

Alternate Test: Valves will be tested during cold shutdown.

B.11 Valve: XVT-8100 & XVT-8112

Category: A

Class: 2a

Function: Containment isolation valves for seal water return from the Reactor Coolant Pump seals.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operations would interrupt flow from the Reactor Coolant pump Central leakage seal system. This flow disruption would cause the differential pressure across #2 seals to decrease causing a failure of the #1 seals.

Alternate Test: Valves will be tested during cold shutdown.

C. SYSTEM: EMERGENCY FEEDWATER SYSTEM (EF)

C.1 Valve: XVC-1039A, B&C and XVC-1038A, B&C

Category: C

Class: 2a

Function: Prevent reverse flow from the steam generator into the Emergency Feedwater System.

Test Requirement: Check valves will be exercised to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing any one of these valves during plant operation would introduce cold auxiliary feedwater to the steam generator inducing unnecessary thermal stress on the Emergency Feedwater Piping.

Alternate Test: These valves will be tested during cold shutdown.

C. SYSTEM: EMERGENCY FEEDWATER SYSTEM (EF)

C.2 Valve: XVC-1015 A&B

Category: C

Class: 2b

Function: Prevent reverse flow from the associated steam generator to the emergency feedwater system.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during plant operation will require establishing emergency feedwater flow to the associated steam generator placing unnecessary thermal stress on the feedwater piping.

Alternate Test: Valves will be tested during cold shutdown.

C.3 Valve: XVG-1001 A&B

Category: B

Class: 2b

Function: Isolate service water from Emergency Feedwater System.

Test Requirement: Exercise valve (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operation could introduce service water into the emergency feedwater pump suction lines and eventually cause chemistry control problems in the steam generator.

Alternate Test: Valves will be tested during cold shutdown.

C.4 Valve: XVG-1002, 1008, 1037 A&B

Category: B

Class: 2b

Function: Isolate service water from the Emergency Feedwater System.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operation could introduce service water into the emergency feedwater pump suction lines and eventually cause chemistry control problems in the steam generators.

Alternate Test: Valves will be tested during cold shutdown.

C.5 Valve: XVC-1016

Category: C

Class: 2b

Function: Preven reverse flow to an idle emergency feedwater pump.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every (3) months.

Basis for Relief: Testing this valve during plant operation will require establishing emergency feedwater flow to a steam generator placing unnecessary thermal stress on the feedwater piping.

Alternate Test: Valve will be tested during cold shutdown.

C.6 Valve: XVC-1013A & B and XVC-1014

Category: C

Class: 2a

Function: Emergency feedwater pumps discharge check valves.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every (3) months.

Basis for Relief. Check valves will be partial stroke exercised quarterly during the EFW Pump Test. Full flow testing during normal plant operations would require establishing emergency feedwater flow to the steam generators placing unnecessary thermal stresses on the emergency feedwater piping.

Alternate Test: Valves will be full flow exercised during the plant shutdown from minimum load to cold shutdown.

C.7 Valve: XVC-1022A & B and XVC-1034A & B

Category: C

Class: 2b

Function: Prevent reverse flow from Emergency Feedwater system into the Service Water System

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing this valve during plant operations could introduce service water into the Emergency Feedwater System and eventually into the Steam Generators causing severe chemistry control problems. Testing valves during cold shutdown would contaminate the Condensate Storage Tank. Partial stroke exercising these valves during normal operation would require isolating the applicable Emergency Feedwater pump which would be a violation of tech. specs.

Alternate Test: Valves will be disassembled and inspected each refueling shutdown.

C.8 Valve: XVC-1019A,B&C and XVC-1020A, B & C

Category: C

Class: 2b

Function: Prevent flow from Steam Generators into the Emergency Feedwater pump discharge piping.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during normal operations would require establishig emergency feedwater flow to the steam generators placing unnecessary thermal stress on the emergency feedwater piping and causing steam generator level control problems which could result in a reactor trip.

Alternate Test: Valves will be tested during shutdown from minimum load to cold shutdown.

D. SYSTEM: MAIN FEEDWATER SYSTEM (FW)

D.1 Valve: XVG-1611A, B&C

Category: B

Class: 2a

Function: Provides a flow path from the main feedwater pumps to the associated steam generator.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during plant operation would isolate feedwater to the associated steam generator which could result in a reactor trip.

Alternate Test: Valves will be tested during cold shutdown.

VALVE TEST RELIEF REQUESTS

F.1 Valve: XVG-2660

Category: A

Class: 2a

Function: Provides flow path from Instrument Air System into Reactor Containment Instrument Air.

Test Requirement: Exercise valve (full stroke) for operability every 3 months.

Basis for Relief: Testing this valve during plant operation or cold shudtown would isolate Reactor Building Instrument Air therefore rendering several systems inoperable.

Alternate Test: Valve will be tested during each refueling S/D.

F.2 Valve: XVC-2661

Category: A/C

Class: 2a

Function: Prevent reverse flow from the reactor containment into the instrument air system.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing this valve requires entry into the Reactor Building. During plant operation this could cause overexposure to the test personnel.

Alternate Test: This valve will be tested during cold shutdown.

G. SYSTEM: MAIN STEAM SYSTEM (MS)

G.1 Valve: XVG-2801A,B&C

Category: B

Class: 2a

Function: Provides the flow path from the associated steam generator to the main steam line header.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing any one of these valves during plant operation would isolate the associated steam generator from the main steam line header which would result in a reactor trip.

Alternate Test: Valves will be tested during each cold shutdown.

NOTE: These valves are partially stroked every three months following surveillance test procedure (STP) 121.002 - Main Steam Valve Operability Test.

J. SYSTEM: SAFETY INJECTION SYSTEM (SI)

J.1 Valve: XVC-8998 A,B&C

Category: A/C

Class: 1

Function: Prevents reverse flow from the reactor coolant system to the low pressure safety injection system.

Test Requirement: Exercise check valves to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing these valves during plant operation will require establishing flow from the low head safety injection system. The RHR pumps do not develop sufficient head to overcome RCS pressure and open the check valves.

Alternate Test: These valves will be tested during cold shutdown.

J.2 Valve: XVC-8997A,B&C

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the Boron Injection System.

Test Requirement: Exercise check valves to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during plant operations will require establishing charging flow through the Boron Injection tank, not only placing unnecessary thermal stresses on the high head injection piping, but also diluting the boric acid concentration in the Boron Injection tank and causing inadvertant boration. Testing these valves during cold shutdown also requires establishing charging flow through the high head injection lines. With the RCS at such a low pressure and temperature, we would have an uncontrolled injection of a large volume of water which could cause a pressure spike in the system and exceed the pressure temperature limits.

Alternate Test: These valves will be tested during each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

J.3 Valve: XVC-8995A, B&C

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the High Head Safety Injection System.

Test Requirement: Exercise check valves to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing these valves during plant operations requires establishing charging flow through the cold leg recir. lines placing unnecessary thermal stresses on the recir. lines. Testing these valves during cold shutdown also requires establishing charing flow through the cold leg recir. lines. With the RCS at such a low pressure and temperature we would have an uncontrolled injection of a large volume of water which could cause a pressure spike in the system and exceed the pressure temperature limits.

Alternate Test: These valves will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

J.4 Valve: XVC-8988 A&B

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the residual heat removal system.

Test Requirement: Exercise check valves to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during plant operations will require initiating flow, using the RHR pumps, into the reactor coolant system. RCS pressure will be higher than RHR pump discharge pressure precluding flow into the RC system.

Alternate Test: Valves will be tested during cold shutdown.

J.5 Valve: XVC-8993 A&B

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the low pressure safety injection system.

Test Requirement: Exercise check valves to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing these valves during plant operations will require establishing RHR flow into the RCS. The RHR pumps (low head safety injection) do not develop enough head to overcome RCS pressure and establish flow.

Alternate Test: These valves will be tested during cold shutdown.

J.6 Valve: XVC-8990A,B&C

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the High Head Safety Injection System.

Test Requirement: Exercise check valves to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during normal operations would require establishing charging flow through the hot leg recir. lines, placing unnecessary thermal stresses on the recir. lines. Testing these valves during cold shutdown also requires establishing charging flow through the hot leg recir. lines. With the RCS at such a low pressure and temperature we would have an uncontrolled injection of a large volume of water which could cause a pressure spike in the system and exceed the pressure temperature limits.

Alternate Test: These valves will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

J.7 Valve: XVC-8992A, B&C

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the High Head Safety Injection System.

Test Requirement: Exercise check valves to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing these valves during normal plant operations would require establishing charging flow through the hot leg recir. lines, placing unnecessary thermal stresses on the recir. lines. Testing these valves during cold shutdown also requires establishing charging flow through the hot leg recir. lines. With the RCS at such a low pressure and temperature we would have an uncontrolled injection of a large volume of water which could cause a pressure spike in the system and exceed the pressure temperature limits.

Alternate Test: These valves will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

J.8 Valve: XVC-8948A,B&C and 8956A,B&C

Category: A/C

Class: 1

Function: Prevent reverse flow from the reactor coolant system to the safety injection accumulators.

Test Requirement: Exercise check valves to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during plant operations would require initiating flow from the SI accumulator to the Reactor Coolant System. The SI accumulators does not have the required pressure to overcome normal Reactor Coolant System pressure, therefore, flow could not be established. During cold shutdown, the RCS would not have the volume to contain the large volume of water required to test these valves causing an overpressure condition for the low temperature. During refueling shutdown, exercising these valves could damage the reactor internals due to the large volume of high pressure water.

Alternate Test: Valves will be disassembled and inspected for operability during each refueling shutdown.

J.9 Valve: XVG-8808A,B&C

Category: B

Class: 2a

Function: Isolate the Safety Injection Accumulator from the reactor coolant loops.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Valves are required by Technical Specifications to remain open during normal plant operation.

Alternate Test: Valves will be tested during cold shutdown.

VALVE TEST RELIEF REQUESTS

J.11 Valve: XVC-8974A&B and XVC-8973A,B&C

Category: A/C

Class: 2a and 1

Function: Prevent reverse flow from the reactor coolant system to the low pressure safety injection system.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: These valves cannot be tested during plant operations, because the low pressure safety injection pumps do not develop sufficient discharge head to establish a flow path to the reactor coolant system.

Alternate Test: These valves will be tested during cold shutdown. Closure of these valves will be verified in accordance with STP 130.001.

J.12 Valve: XVC-8926

Category: C

Class: 2a

Function: Prevent reverse flow from the Charging Pump Suction/VCT to the refueling water storage tank.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing this valve during normal plant operations would cause an inadvertant boration due to the high concentration of boric acid in the RWST, thus a plant shutdown. During cold shutdown, the RCS does not have the volume to contain the large volume of water required to test the valve and you would exceed the maximum pressure for the low temperature.

Alternate Test: The valve will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

J.13 Valve: XVG-8884, 8885 and XVG-8886

Category: A

Class: 2a

Function: High head hot leg injection isolation valves.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operation will place charging flow through the high pressure safety injection line placing unnecessary thermal stress on the safety ijection piping.

Alternate Test: Valves will be tested during cold shutdown.

VALVE TEST RELIEF REQUESTS

J.14 Valve: XVG-8803A&B

Category: B

Class: 2a

Function: Isolate charging to the Boron Injection Tank

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Exercising these valves during normal plant operations could dilute the boron injection tank below the minimum concentration required by Technical Specifications.

Alternate Test: Valves will be tested during cold shutdown.

J.15 Valve: XVC-8993C

Category: A/C

Class: 1

Function: Prevent reverse flow from the Reactor Coolant System to the hot leg injection lines.

Test Requirement: Exercise check valves to the position required to fulfill their function every three (3) months.

Basis for Relief: Since suction for the charging pumps would be shifted to the RWST to perform this test, testing this valve during normal plant operation would cause an inadvertant boration due to the high concentration of boric acid in the RWST, thus a plant shutdown. In addition, testing this valve during normal operation would cause excessive thermal shock to the Safety Injection to RCS piping. During cold shutdown, the RCS does not have the volume to contain the large amount of water required to test the valve, thus exceeding the maximum pressure for these low temperatures.

Alternate Test: Valves will be tested at the end of each refueling when the vessel head is removed and refueling pool can be used to contain the large volume of water.

J.16 Valve: XVC-8801A and 8801B

Category: A

Class: 2a

Function: Boron Injection Tank outlet isolation valves.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operation could inject high concentration of boric acid into the high head injection lines and thus into the RCS causing an inadvertant boration and plant shutdown. During cold shutdown exercising these valves could cause migration of the high concentration of boric acid into the high head injection lines, which are not heat traced, causing solidification and blockage of these lines.

Alternate Test: Valves will be exercised each refueling shutdown with the high head injection check valves.

J.17 Valve: XVG-8888A and 8888B

Category: B

Class: 2a

Function: RHR pump low head Safety Injection Isolation

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operation would require isolating one of the RHR loops. This would violate the Technical Specification Requirement 3/4.5.2, requiring two independent Emergency Core Cooling Systems (ECCS) operable.

Alternate Test: Valves will be tested during cold shutdown when one loop of the RHR can be shutdown and tested.

J.18 Valve: XVG-8809A and 8809B

Category: B

Class: 2a

Function: Isolate RHR pump suction from the RWST

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: Testing these valves during normal plant operation would isolate the RWST from the suction of the RHR pumps, violating Technical Specification Requirements, 3/4.5.2 requiring two (2) Emergency Core Cooling Systems operable with flow path capable of taking suction from the refueling storage tank on a safety injection signal.

Alternate Test: Valves will be tested during cold shutdown when one loop of the RHR can be shutdown and tested.

K. SYSTEM: REACTOR BUILDING SPRAY SYSTEM (SP)

K.1 Valve: XVC-3009 A & B

Category: A/C

Class: 2a

Function: Prevent reverse flow from the reactor containment into the Reactor Building Spray System.

Test Requirement: Check valves will be exercised to the position required to fulfill their function, every three (3) months.

Basis for Relief: Testing these valves during plant operation would require placing the Reactor Building Spray System in operation which would result in dousing the containment and filters.

Alternate Test: Valves will be disassembled and inspected for operability during each refueling shutdown.

K.2 Valves: XVG-3002A&B

Category: B

Class: 2a

Function: NaOH to spray pump suction isolations and checks

Test Requirements: Exercise valves (full stroke) for operability, every three (3) months.

Basis for Relief: Testing these valves during normal plant operations would require isolating the NaOH storage tank, which would violate the Technical Specifications.

Alternate Test: Valves will be tested during cold shutdown.

K.3 Valves: XVC-3013 A & B

Category: C

Class: 2a

Function: Prevent reverse flow from the reactor containment into the Reactor Building Spray System

Test Requirements: Check valves will be exercised to the position required to fulfill their function every three (3) months.

Basis for Relief: Testing these valves during plant operation or cold shutdown would require placing the spray system in operation which would result in dousing the containment and filters or pumping sodium hydroxide to the RWST.

Alternate Test: Valves will be disassembled and inspected for operability during each refueling shutdown.

L. SYSTEM: SERVICE WATER SYSTEM (SW)

L.1 Valve: XVG-3107A&B

Category: B

Class: 2b

Function:	Isolate service water from the reactor containment.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for Relief:	Testing these valves during plant operations will cause service water to mix with the industrial cooling water, causing a problem with the chemistry control of the Industrial cooling water system.
Alternate Test:	Valves will be tested during cold shutdown.

M. SYSTEM: CRDM COOLING SYSTEM

M.1 Valve: XVG-7501, 7502, 7503 and 7504

Category: A

Class: 2a

Function:	Containment Isolation Valves for the CRDM Cooling System
Test Requirement:	Valves will be exercised (full stroke) for operability every three (3) months.
Basis for Relief:	In the event that maintenance is required, upon the failure of either of these valves, by testing, during plant operation, it could cause overheating of the CRDM's.
Alternate Test:	Valves will be tested during cold shutdown.

VALVE TEST RELIEF REQUESTS

N.1 Valve: XVB-0001A & B and XVB-0002A & B

Category: A

Class: 2a

Function: Isolate the Reactor Building purge supply and exhaust.

Test Requirement: Exercise valves (full stroke) for operability every three (3) months.

Basis for Relief: During normal plant operations these valves are locked closed and required by technical specifications to remain closed.

Alternate Test: Valves will be full stroke exercised during cold shutdown.

P. System: PASSIVE CONTAINMENT ISOLATION VALVES

P.1 Valves: XVC-7541, XVC-7544, XVC-9689, XVC-8103, XVC-8703A, XVC-8703B, XVG-8702A, XVG-8702B, XVC-2913, XVT-2912, XVG-8701A, XVC-8701B, XVC-6799, XVD-8767, XVC-6588, XVG-6587, XVT-2679, XVT-2680, XVX-6052B, XVX-6052A, XVX-6053A, XVX-6053B, XVX-6050B, XVD-6051A, XVD-6051C, XVD-8768, XVX-6051B, XVD-6671, XVD-6672, XVD-6697, XVD-6698, XVD-7135, XVG-6772, XVG-6773.

Category: A/C for check valves. A for other valves.

Class: 2A

Function: Provide Containment Isolation for various systems.

Test Requirement: Leak test in accordance with ASME Section XI Code every two (2) years.

Basis for Relief: Valves are required to be tested every eighteen (18) months to two (2) years in accordance with Appendix J and/or Technical Specifications.

Alternate: Leak test valves in accordance with the requirements of Appendix J, Technical Specifications and/or Surveillance Test Procedures.

Q. System: REACTOR COOLANT SYSTEM

Q.1 Valves: PCV-445A, PCV-445B, and PCV 444B

Category: B

Class: 1

Function: To provide overpressure protection for the Reactor Coolant System.

Test Requirement: Exercise Valve (full stroke) for operability every three (3) months.

Basis for Relief: Testing of these valves during power operation would require the associated downstream block valves to be closed. Should the associated block valve fail in the closed position the margin of safety for overpressure protection would be reduced.

Alternate: Valves will be tested during cold shutdown.

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

GENERAL TEST PROCEDURE

GTP-004

INSERVICE INSPECTION SYSTEM PRESSURE TESTING

REVISION 2

SEPTEMBER 13, 1982

NON-CONTROLLED COPY

SAFETY RELATED

Reviewed by:

Larry B. Collins — 10-19-82
ORIGINATOR (of this revision) — Date

Larry B. Collins — 10-19-82
DISCIPLINE SUPERVISOR — Date

Approved:

M D Quinton — 10-27-82
ASST. MGR, MAINTENANCE SERVICES — Date

Date Issued: OCT 29 1982

LIST OF EFFECTIVE PAGES

PAGE	REVISION
i	2
ii	2
1	2
2	2
3	2
4	2
5	2
6	2
7	2
8	2
9	2
10	2
11	2
12	2
13	2

ATTACHMENTS

Attachment 7.1	2
Attachment 7.2	2
Attachment 7.3	2
Attachment 7.4	2
Attachment 7.5	2
Attachment 7.6	2
Attachment 7.7	2
Attachment 7.8	2

TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure provides the necessary controls for system pressure tests including leakage tests, hydrostatic tests, and, if applicable, pneumatic tests for ASME Section III code class 1, 2, and 3 pressure retaining components.

2.0 REFERENCES AND GLOSSARY

2.1 References

2.1.1 ASME Boiler and Pressure Vessel Code Section III, 1971 Edition through the summer 1973 addenda.

2.1.2 ASME Boiler and Pressure Vessel Code Section V, 1977 Edition Through the summer 1978 addenda.

2.1.3 ASME Boiler and Pressure Code Section XI, Section 1977 Edition through the summer 1978 addenda.

2.1.4 SAP-139, Development, Revision, and Approval of Procedures.

2.1.5 SAP-146, Non-Conformance Control Program

2.1.6 SAP-141, Control and Calibration of Measuring and Test Equipment.

2.1.7 SAP-145, Inservice Inspection.

2.1.8 10 CFR 50.55a.

2.1.9 SAP-108 Station Staff Qualifications and Training.

2.1.10 Applicable Surveillance Test Procedures

2.1.11 10 CFR 50.55 Appendix J

2.2 Glossary

2.2.1 Authorized Nuclear Inservice Inspection (ANII) - An inspector employed by an insurance company authorized to write boiler and pressure vessel insurance and having qualified in accordance with the requirements of ANSI/ASME N626.1 - 1975.

2.2.2 ASME Code (Code) - An approved ANSI document published by the American Society of Mechanical Engineers including, but not limited to, specific construction requirements, pre-service inspection requirements and inservice inspection requirements for certain classified pressure systems, components and their supports.

2.2.3 Code Class - A classification of items and components based upon the Section III construction code subsection used to fabricate and/or install such items.

A. Class 1 - Subsection NB

B. Class 2 - Subsection NC

C. Class 3 - Subsection ND

D. Class MC - Subsection NE

E. Component Supports - Subsection NF

2.2.4 Inservice Inspection (ISI) - Those scheduled inspection activities performed during the plant lifetime as outlined in ASME Code Section XI.

2.2.5 Inservice Inspection Coordinator (ISI Coordinator)-That individual designated by the Manager, V. C. Summer Nuclear Station, who is responsible for development and implementation of the ISI Program.

2.2.6 Inservice Inspection Program - Those planned and systematic actions performed to: categorize the area subject to inspection and responsibilities, provide for accessibility, apply examination methods and procedures, qualify personnel, establish frequency of inspection, establish and maintain record keeping and reporting requirements, evaluation of inspection results and, if necessary subsequent disposition and corrective action of such results, and document a repair program.

2.2.7 Inspection Interval - That amount of time approximately equal to 1/4 of expected plant life. (10 years) See Attachment 7.1.

2.2.8 Inspection Period - That amount of time in calender years and/or months approximately equal to 1/3 of an inspection interval. (3 to 4 years) See Attachment 7.1.

2.2.9 Regulatory Authority - A Federal Government Agency such as the USNRC.

2.2.10 Replacement - A spare component(s), parts of such component(s), or subsystem(s) but not the addition of new systems.

2.2.11 Repair - Welding rework activities, including initial and surface finishing processes, required to return an item to condition acceptable to code.

2.2.12 Rework - Repair or replacement activities, or a combination thereof required to return an item to a condition acceptable to the Code.

2.2.13 Technical Services Coordinator - That individual designated by the Manager, V. C. Summer Nuclear Station, to act as liason for SCE&G/NO with the USNRC.

2.2.14 Abbreviations.

A. SCE&G/NO - South Carolina Electric and Gas Company, Nuclear Operations.

B. USNRC - United States Nuclear Regulatory Commission.

3.0 RESPONSIBILITIES

3.1 Procedure SAP-145 establishes, describes and delineates the responsibilities associated with the System Pressure Testing Program.

4.0 INSERVICE INSPECTION TESTING AND EXAMINATION

4.1 Inservice Inspection.

4.1.1 The required pressure tests and concurrent visual examinations (VT-2) shall be identified and scheduled in accordance with the requirements of attachment 7.2 unless specific relief has been granted by the Regulatory Authority. The required system pressure tests are indexed in attachments 7.3 and 7.4.

4.1.2 Pressure tests and examinations shall be performed in accordance with written approved procedures.

4.1.3 Personnel performing the required visual examinations during the pressure test shall be qualified in accordance with ASME Code Section XI and the appropriate Station Quality Control or Operations Procedures.

4.1.4 Type A, B, and C testing per 10 CFR 50 Appendix J shall be in accordance with Surveillance Test Program (206 and 115 Series) in accordance with Attachment 7.6. Appendix J testing may be substituted for the required ASME Section XI Testing, when applicable.

4.2 Pressure Test and Examination Scheduling

4.2.1 In addition to the requirements of 4.1.2 class 1 inservice pressure tests and examinations shall be performed during plant outages; class 2 and 3 tests and examinations may be performed, as appropriate, either during plant outages or during systems operations.

4.2.2 The pressure tests and examinations shall be performed and completed during each period and/or interval, as applicable, during the the service lifetime of the plant except as otherwise noted in paragraph 4.2.3.

4.2.3 Each inspection interval may be decreased or extended (but not cumulatively) by as much as 1 year. If the plant is out of service continuously for 6 months or more, the inspection interval during which the outage occurred may be extended for a period of time equivalent to the outage.

4.2.4 The inspection interval and period is determined by the number of calendar years following placement of the plant into commercial service. Attachment 7.1, Inspection Program B, tabulates 4 consecutive intervals.

4.2.5 Inspection intervals for repaired items, component replacments, additions, and alterations shall coincide with the remaining intervals as originally scheduled prior to such repairs, replacements, additions or alterations.

4.2.6 Repaired items, replacements, additions, alterations and items which have been opened and reclosed shall be pressure tested and visually examined (VT2) in accordance with the applicable code and procedure after such activities have been completed prior to or at the time the applicable component is placed back into service.

4.2.7 System and/or component pressure tests and concurrent examinations may be performed in conjunction with one or more of the following operations.

A. Leakage test after pressurization to nominal operating pressure.

B. Leakage test performed concurrently with the system functional test.

C. Leakage test performed concurrently with a hydrostatic test.

D. Hydrostatic test or <u>other</u> <u>required</u> system pressure tests for repairs, alterations, replacements and additions may be performed concurrently with applicable scheduled pressure tests providing the requirements of paragraph 4.2.6 are not violated.

E. Visual examination performed after the required test pressure holding time has been satisfied.

NOTE: During the required visual examination test conditions shall remain essentially constant.

4.2.8 Except for items repaired by welding, the appropriate leak test for items which have been opened and reclosed may be performed during or before the System Leak Test and recorded on Attachment 7.7 and a completed copy of Attachment 7.7 will be attached to the appropriate MWR.

4.2.9 For Leak Tests required after opening and reclosing a system or component Attachment 7.8 shall be used to determine the maximum leakage rate without further engineering evaluation.

4.3 Pressure and Temperature Requirements (Class 1)

4.3.1 Class 1 system leakage tests shall be performed at a test pressure not less than the nominal operating pressure associated with 100% rated reactor power. The system test pressure and temperature shall be attained at a rate in accordance with the heatup limitations specified for the system.

4.3.2 Class 1 system hydrostatic tests shall be performed at a test pressure of 1.10 times the system nominal operating pressure (Po) that corresponds with 100% rated reactor power or may be conducted at temperatures above 100°F in accordance with the following tempera ıre-pressure criteria except as modified in 4.3.2(A) and/or 4.3.2(B), as applicable.

4.3.2

Test Temperature	Test Pressure
200°F	1.08 Po
300°F	1.06 Po
400°F	1.04 Po
500°F	1.02 Po

A. Class 1 hydrostatic tests shall meet the requirements as specified by fracture prevention criteria applicable to ferritic materials of system components.

B. Class 1 test temperature shall be modified as required by the results obtained from each set of material surveillance specimens withdrawn from the reactor vessel during the service lifetime.

4.4 Pressure and Temperature Requirements (Class 2).

4.4.1 Class 2 system and component leakage or functional tests shall be performed at nominal operating pressure of such systems or components, as applicable.

4.4.2 Class 2 system and/or component hydrostatic test pressures, as applicable, shall be determined as follows, except as described in 4.4.3 through 4.4.7 where Psv is the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested.

Design Temperature	Test Pressure
$\leq$ 200°F	1.10 Psv
$\geq$ 200°F	1.25 Psv

4.4.3 In the case of class 2 atmospheric storage tanks, hydrostatic test pressure developed with the tank filled to its design capacity shall be the acceptable test pressure.

4.4.4 For 0 - 15 PSI class 2 storage tanks the test pressure shall be 1.1 times Pg where Pg is the design pressure of the vapor or gas space above the liquid level for which overpressure protection is provided.

4.4.5 Open ended portions of class 2 suction or drain lines from a storage tank to the first shutoff valve shall be considered as part of either an atmospheric storage tank or a 0 - 15 PSI storage tank, as applicable.

4.4.6 In the case of open ended portions of class 2 discharge lines in non-closed systems (such as the containment spray header), any test that demonstrates unimpaired flow shall be acceptable in lieu of system hydrostatic pressure test.

4.4.7 The test temperature for class 2 systems and components containing ferritic steel items shall meet the requirements specified by fracture prevention criteria. In systems containing ferritic steel components in which fracture toughness and/or fracture prevention criteria were neither specified nor required the system test temperature shall be determined by SCE&G. There is no established limit on system or component test temperature for such systems and/or components constructed entirely of austenitic steel materials.

4.5 Pressure and Temperature Requirements (Class 3)

4.5.1 For Class 3 system inservice tests the inservice operating pressure during system operation shall be acceptable as the system test pressure.

4.5.2 For Class 3 system functional tests the nominal operating pressure of the system shall be acceptable as the system test pressure.

4.5.3 For Class 3 system and component hydrostatic tests, the pressure and temperature shall be determined as specified in paragraphs 4.4.2 through 4.4.7 of this procedure.

4.6 Pressure Holding Times for Class 1, 2, and 3 Items

4.6.1 SYSTEM LEAKAGE TEST - No holding time required after attaining test pressure and temperature conditions.

4.6.2 SYSTEM HYDROSTATIC TEST

A. Non-insulated system or component - 10 minutes required after attaining test pressure and temperature conditions.

B. Insulated system or component - 4 hours required after attaining test pressure and temperature conditions.

4.6.3 SYSTEM FUNCTIONAL TEST - 10 minutes after attaining the required test pressure and temperature conditions.

4.6.4 SYSTEM INSERVICE TESTS - No holding time required providing the system has been in operation for 4 hours, otherwise, an additional amount of holding time is required to obtain 4 hours total.

4.6.5 SYSTEM PNEUMATIC TESTS - 10 minutes after attaining the required test pressure.

4.7 Visual Examination (VT-2)

4.7.1 Visual examinations (VT-2) shall be performed after attaining the required test pressure and temperature conditions in accordance with the requirements of applicable Surveillance Test Procedures except as permitted by 4.7.2.

4.7.2 The visual examination, VT-2, following a repair or replacement of a component, or the alteration of a system may be limited to the repaired or replaced components, or the altered portion of a system, but shall include any connection made to the existing system.

4.8 <u>Repair, Replacement or Rework Pressure Tests</u>

4.8.1 Repair Pressure Tests (Class 1, 2, and 3)

A. After repairs by welding on the pressure retaining boundary a hydrostatic test shall be performed and a visual examination (VT-2) shall be conducted as specified by paragraph 4.7.2 except as noted in 4.8.1(B).

B. The following maybe exempted from the required hydrostatic test(s):

1) Cladding repairs.

2) heat exchanger tube plugging

3) piping, pump and valve repairs that do not penetrate through the pressure boundary

4) pressure vessel repairs where the repaired cavity does not exceed 10% of the minimum design wall thickness

5) Component connections, piping and associated valves that are 1" nominal pipe size and smaller.

NOTE: Repairs made in accordance with a procedure which allows exception from postweld heat treatment shall not be exempted from hydrostatic tests.

4.8.2 Rework and Replacement Tests (Class 1, 2, and 3)

A. Pressure tests shall be performed subsequent to rework or replacement welding activities as specified in 4.8.1.

B. Subsequent to rework or replacement activities not involving welding a leakage test shall be conducted following reclosing of a component in the system.

4.9 Test Gages, Instrumentation, and Equipment

4.9.1 System instrumentation, test instruments, or test gages may be used for the system tests described in this procedure providing the applicable requirements of 4.9.1 though 4.9.7 have been satisfied.

4.9.2 The test gages used in pressure testing shall provide results accurate to within .5% of full scale.

4.9.3 All test gages shall be calibrated against a standard dead weight tester or a calibrated master gage. The test gages shall be calibrated before each test or before each series of tests. A series of tests is a group of tests that use the same pressure test gage(s) and such tests are conducted within a period not exceeding 2 weeks.

4.9.4 Indicating pressure gages used in testing shall have their dials graduated over a range of at least 1.5 times, but not more than 4 times, the intended maximum test pressure.

4.9.5 When testing an isolated component, the pressure measuring gage, instrument or sensor shall be connected as close to the component as practical.

4.9.6 When testing a group of components or a multicomponent system, the pressure measuring gage, instrument or sensor shall be connected to any point within the pressure boundary of the components or system such that the imposed pressure on any component, including static head, will not exceed 106% of the specified test pressure for those part of the system under consideration.

4.9.7 Any equipment required to perform pressure testing shall meet as a minimum, the cleanliness requirements of the system or component to be tested.

4.9.8 Test gages and instrumentation shall be calibrated in accordance with the requirements of SAP-141.

4.10 Corrective Measures

4.10.1 The source of leakages detected during the performance of system pressure test shall be located and evaluated for corrective measures as follows:

A. Buried components with leakage losses in excess of limits acceptable for continued service shall be repaired or replaced;

B. Repairs to components shall be performed in accordance with the requirements of SAP-302, SAP-304 WM-1.0, WM-2.0 and other criteria of the applicable design specifications.

C. Replacement of components shall be perferred in accordance with IWA-7000 of the Code.

D. The detection of boric acid residues on ferritic steel components shall require the location of the leakage source and the areas of general corrosion, if any. Components or other items with local areas of general corrosions that reduce the wall thickness by more than 10% on that would inhibit the capability of such items or components to perform their intended function shall be evaluated to determine whether the component may be acceptable for continued service, or repair or replacement is required.

NOTE: General Corrosion is an approximate uniform wastage of a surface of a component, through chemical or electros chemical reaction, free of deep pits or cracks.

5.0 DOCUMENTATION

5.1 Examinations and test plans and schedule shall be developed, approved and distributed in accordance with the requirements of this procedure.

5.2 Surviellance Test Procedures used for system pressure tests during Inservice Inspection either have been or will be prepared and approved in accordance with, SAP-139 prior to performing the applicable test(s).

5.3 NDE personnel Qualification records shall be maintained in accordance with the requirements of Operations and Station Quality Control Procedures, as applicable.

5.4 System pressure tests shall be documented in accordance with the requirements of this procedure and/or the applicable Surveillance Test Procedure.

5.5 When required, Radiation Work Permits will be initiated and completed in accordance with Health Physics Procedures.

5.6 When required, safety tags shall be issued, completed, attached to appropriate equipment, and filed in accordance with SAP-201.

5.7 A copy of the evaluation and, if required, disposition and corrective measure records shall become part of the Surveillance Test Procedure record.

5.8 Test summary reports shall be prepared from the Surviellance Test Procedure records and submitted to the Regulatory Authority within 90 days after completion of the inservice inspection outage.

5.9 Test, evaluation, disposition and corrective measure records shall be maintained for the service lifetime of the component.

5.10 Visual examination (VT-2) records shall be maintained in accordance with the applicable Surveillance Test Procedures.

5.11 When required, a non-conforming condition shall be documented in accordance with the requirements of SAP-146.

5.12 Flow drawings, as referenced in Attachment 7.4, shall be available for review during system hydrostatic testing activities.

5.13 Relief requests, if any, shall be referenced on Attachment 7.5 as applicable. Such relief requests shall be indexed, stored and maintained under separate cover.

6.0 RESULTS

6.1 Evaluation of the pressure test and examination data shall be performed in accordance with the requirements of the applicable code, standard or specification and included as part of the Surveillance Test Procedure Record as described in paragraph 5.7.

6.2 Disposition and corrective measures, as a result of unacceptable tests or examinations, may be implemented using original design data, improved design data, newly developed techniques, appropriate standards and codes, or a combination thereof.

6.3 Corrective measures implemented to correct a non-conforming condition shall detail the activities performed including the action taken to prevent recurrence of the condition.

7.0 ATTACHMENTS

7.1 Code class 1, 2, and 3 System and Component Inspection Program (1 Page).

7.2 Code class 1, 2, and 3 Test and Examination Schedule (4 pages)

7.3 Code class 1, 2, and 3 ISI Hydrostatic Test Reference Index (6 pages)

7.4 Code class 1, 2, and 3 System Leak Testing (1 page)

7.5 Code class 1, 2, and 3 Relief Request Identification

7.6 Appendix J Testing

7.7 System Open/Reclose Test Record.

7.8 System Open/Reclose Test Acceptance Criteria

CODE Class 1, 2, & 3 Component Inspection Program

Inspection Interval	Inspection Period Calendar Years of Plant Service
1st	3 7 10
2nd	13 17 20
3rd	23 27 30
4th	33 37 40

TEST AND EXAMINATION SCHEDULE
CLASS 1

ITEM NO.	PARTS EXAMINED	TEST REQUIRED (1)(2)(3)	EXAMINATION METHOD (4)	1ST INSPECTION INTERVAL	SUCCESSIVE INSPECTION INTERVALS 2ND, 3RD, 4TH	DEFERRAL OF INSPECTION TO END OF INTERVAL
	REACTOR VESSEL					
B15.10	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling Outage	
B15.11	Pressure Boundary	Hydrostatic	VT-2	One test	One test per interval	Permissible
	PRESSURIZER					
B15.20	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling outage	
B15.21	Pressure Boundary	Hydrostatic	VT-2	One test interval	One test per interval	Permissible
	STEAM GENERATORS					
B15.30	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling outage	
B15.31	Pressure Boundary	Hydrostatic	VT-2	One test	One test per interval	Permissible
	HEAT EXCHANGERS					
B15.40	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling outage	
B15.41	Pressure Boundary	Hydrostatic	VT-2	One test	One test per interval	Permissible

NOTES: (1) - Entire pressure retaining boundary of the reactor coolant system is subject to system pressure test conducted in accordance with IWA-5000 with the exceptions specified in IWA-5214 when system pressure tests are conducted for repaired, replaced or altered components.

(2) - Leakage test IWB-5221, Hydrostatic Test IWB-5222.

(3) - Acceptance standard IWA-5250.

(4) - Visual examination of IWA-5240.

TEST AND EXAMINATION SCHEDULE
CLASS 1

ITEM NO.	PARTS EXAMINED	TEST REQUIRED (1)(2)(3)	EXAMINATION METHOD (4)	1ST INSPECTION INTERVAL	SUCCESSIVE INSPECTION INTERVALS 2ND, 3RD, 4TH	DEFERRAL OF INSPECTION TO END OF INTERVAL
	PIPING					
B15.50	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling Outage	
B15.51	Pressure Boundary	Hydrostatic	VT-2	One test	One test per interval	Permissible
	PUMPS					
B15.60	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling outage	
B15.61	Pressure Boundary	Hydrostatic	VT-2	One test	One test per interval	Permissible
	VALVES					
B15.70	Pressure Boundary	Leakage	VT-2	Each refueling outage	Each refueling outage	
B15.71	Pressure Boundary	Hydrostatic	VT-2	One test	One test per interval	Permissible

NOTES: (1) - Entire pressure retaining boundary of the reactor coolant system is subject to system pressure test conducted in accordance with IWA-5000 with the exceptions specified in IWA-5214 when system pressure tests are conducted for repaired, replaced or altered components.
(2) - Leakage test IWB-5221, Hydrostatic Test IWB-5222.
(3) - Acceptance standard IWA-5250.
(4) - Visual examination of IWA-5240.

TEST AND EXAMINATION SCHEDULE
CLASS 2

ITEM NO.	PARTS EXAMINED	TEST REQUIRED (1)(2)(3)	EXAMINATION METHOD (4)	EXTENT OF EXAMINATION (5)	FREQUENCY OF EXAMINATION (6)
	PRESSURE VESSELS				
C7.10	Pressure Components	Leakage	VT-2	Pressure Boundary	Each Inspection Period
C7.11	Pressure Components	Hydrostatic	VT-2	Pressure Boundary	Each Inspection Interval
	PIPING				
C7.20	Pressure Components	Leakage	VT-2	Pressure Boundary	Each Inspection Period
C7.21	Pressure Components	Hydrostatic	VT-2	Pressure Boundary	Each Inspection Interval
	PUMPS				
C7.30	Pressure Components	Leakage	VT-2	Pressure Boundary	Each Inspection Period
C7.31	Pressure Components	Hydrostatic	VT-2	Pressure Boundary	Ech Inspection Interval
	VALVES				
C7.40	Pressure Components	Leakage	VT-2	Pressure Boundary	Each Inspection Period (7)
C7.41	Pressure Components	Hydrostatic	VT-2	Pressure Boundary	Each Inspection Interval

NOTES: (1) - Other than open-ended portions of systems.
(2) - System pressure tests of IWA-5000 and IWC-5000; Leakage test IWC-5221, Hydrostatic Test IWC-5222.
(3) - Acceptance Standard IWA-5250.
(4) - Visual examination of IWA-5240.
(5) - There are no exemptions or exclusions from these requirements except as specified in IWA-5214.
(6) - The system hydrostatic test shall be conducted at or near the end of each inspection interval or during the same inspection period of each inspection interval.
(7) - A system functional test (IWC-5221) serves as a required system pressure test.

TEST AND EXAMINATION SCHEDULE
CLASS 3

ITEM NO.	PARTS EXAMINED	TEST REQUIRED (3)	EXAMINATION METHOD	EXTENT OF EXAMINATION	FREQUENCY OF EXAMINATION
D-A D.1.1	Pressure Components (1)	Leakage (2)	VT-2	NOTE (4)	Each Period
	Pressure Components (1)	Hydrostatic	VT-2	NOTE (4)	Same Period (5) of each interval
D-B D.2.1	Pressure Components (6)	Leakage (7)	VT-2	NOTE (6)	Each Period
	Pressure Components (6)	Hydrostatic	VT-2	NOTE (6)	Same Period (5) of each interval
D-C D.3.1	Piping (8) Pumps, Valves	Leakage (2)	VT-2	NOTE (8)	Each Period
	Piping (8) Pumps, Valves	Hydrostatic	VT-2	NOTE (8)	Same Period (5) of each interval

NOTES: (1) - Pressure retaining components within the boundary of systems or portions of systems required to operate in support of normal plant safety functions of shutting down and maintaining the reactor in cold shutdown condition.

(2) - Operating system inservice test (IWD-5221).

(3) - Hydrostatic Pressure Test (IWD-5223).

(4) - The system boundary includes only those portions of the system required to operate or support the safety system function up to and including the first normally closed valve or valve capable of automatic closure when the safety function is required.

(5) - For Inspection Program B, the hydrostatic test and subsequent visual examination shall be performed during the same period of each inspection interval.

(6) - Pressure retaining components within the boundary of systems or portions of systems required to operate in support of the post-accident safety functions of emergency core cooling, containment heat removal and atmosphere cleanup, and long term residual heat removal from the reactor.

(7) - Operating system functional test (IWD-5222).

(8) - Pressure retaining piping, pumps and valves within the boundary of systems or portions of systems required to operate in support of residual heat removal from spent fuel storage pool.

ISI HYDRO AND/OR PNEUMATIC TESTING REFERENCE INDEX

STP NO.	SYSTEM(#)	CODE CLASS	DESCRIPTION	FLOW DWG.
149.001	CC-01-H1	3	Component Cool Low Pressure Hydro	D-302-611
149.002	CC-02-H1	3	Component Cool Surge Tnk Hydro	D-302-611
149.003	CC-04-H1	2/3	Component Cool Inside Reactor Bldg.	D-302-612
149.004	CC-04-H2	2/3	CC Boost Pmp Discharge Hydro	D-302-612
149.005	CC-04-H3	3	CC to RCP Therm Barrier Hydro	D-302-612
149.006	CC-05-H1	3	CCW to Non-Essential Equip. Hydro Test	D-302-613
149.007	CS-01-H1	2	Charging Pump Suction Pipe Hydro	114E073
149.008	CS-02-H1	2	Volume Control Tank and Piping Hydro	114E073
149.009	CS-02-H3	3	Makeup Piping Hydro	114E073
149.010	CS-03-H1	2	Charging Pump Discharge Pipe Hydro	114E073
149.011	CS-04-H1	2	Charging Header Hydro	114E073
149.012	CS-05-H1	2	Seal Injection Piping Hydro	114E073
149.013	CS-07-H1	2	RC Pump Seal Return Lines Hydro	114E073
149.014	CS-07-H2	2	RCP A,B,&C Seal Return Lines Hydro	114E073
149.015	CS-07-H3	2	RCP A,B,&C Common Seal Return Line Hydro	114E073
149.016	CS-08-H1	1	Excess Letdown Hydro	114E073
149.017	CS-09-H1	1	High Pressure Letdown Hydro	114E073
149.018	CS-11-H1	2	Letdown Line IP Hydro	114E073
149.019	CS-12-H1	2/3	Letdown Line LP Demin Hydro	114E073
149.020	CS-13-H1	2	BCMS Hydro	114E073
149.021	CS-17-H1	3	Boric Acid Transfer Pump Suction Hydro	114E073

ISI HYDRO AND/OR PNEUMATIC TESTING REFERENCE INDEX

STP NO.	SYSTEM(#)	CODE CLASS	DESCRIPTION	FLOW DWG.
149.022	CS-17-H2	3	Boric Acid Transfer Pump Discharge Hydro	114E073
149.023	CS-17-H3	2	Boric Acid Store Tanks Hydro	114E073
149.024	CS-20-H1	3	BRTS Demineralizer Hydro	114E076
149.025	CS-21-H1	3	Holdup Tank Header Hydro	114E076
149.026	CS-22-H1	3	Holdup Tank Eductor Hydro	114E076
149.027	CS-23-H1	3	Recycle Evap Feed Demin Hydro	114E076
149.028	CS-24-H1	3	Recycle Evap Hydro	114E076
149.029	CS-26-H1	3	Recycle Evap Feed Pump Suction and Disch	114E076
149.030	CS-26-H2	3	Static Test Recycle Holdup Tank 1	114E076
149.031	CS-26-H3	3	Static Test Recycle Holdup Tank 2	114E076
149.032	CS-27-H1	3	CVCS Relief Valve Discharge Header Hydro	114E076
149.033	DG-02-H1	3	D/G Fuel Oil Storage Tnk A Pipe Hydro	D-302-351
149.034	DG-03-H1	3	D/G Fuel Oil Storage Tnk B Pipe Hydro	D-302-351
149.035	DG-04-H1	3	D/G "B" Day Tnk & Pipe PNEU	D-302-351
149.036	DG-05-H1	3	D/G "A" Day Tnk & Pipe PNEU	D-302-351
149.037	DG-08-H1	3	D/G "A" Starting Air Pneumatic Test	D-302-353
149.038	DG-09-H1	3	Diesel Gen "B" Starting Air Pneumatic Test	D-302-353
149.039	DG-10-H1	3	Diesel Gen "A" Crankcase Vac System Lk Test	D-302-353
149.040	DG-11-H1	3	Diesel Gen "B" Crankcase Vac System Lk Test	D-302-353
149.041	DG-12-H1	3	Diesel Gen "A" Jacket Cool Watr Hydro	D-302-353
149.042	DG-13-H1	3	Diesel Gen "B" Jacket Cool Watr Hydro	D-302-353
*115.025	DN-03-H2	2	Demin Water RB Penetration #231 Hydro	D-302-715

ISI HYDRO AND/OR PNEUMATIC TESTING REFERENCE INDEX

STP NO.	SYSTEM (#)	CODE CLASS	DESCRIPTION	FLOW DWG.
140.043	EF-01-H1	3	Emer FW Pmps Suction Piping Hydro	D-302-085
149.044	EF-02-H1	3	Emer FW Pmps Discharge Header Hydro	D-302-085
*115.023	FS-01-H1	2	Fire Protection Sys RB Pen #404 Hydro	D-302-231
*115.023	FS-19-H2	2	Fire Protection Sys RB Pen #427 Hydro	D-302-231
149.045	FW-01-H1	2	Hydrotest of FW Nuclear Lines	D-302-083
149.046	GH-02-H1	3	Wastegas Comp Suct Hd & Recirc Hydro	114E077
150.020	GH-03-H1	3	Operational Leak Test of Wastegas Decay Tanks	114E077
150.020	GH-04-H1	3	Operational Leak Test of Wastegas Shtdn Tks	114E077
149.049	HR-02-H1	2	Post Acc Hydro RB Pent 103&302 Pneu Test	D-302-861
149.050	HR-03-H1	2/3	Post Acc Hydro Analyzer A Piping Pneu Test	D-302-861
149.051	HR-03-H2	2/3	Post Acc H? Analyzer B Piping Pneu Test	D-302-273
*115.014	IA-08-H2	2	Pneumatic Test of Instr Air RB Pen # 319	D-302-273
*115.014	IA-11-H2	2	Hydrotest Rebu Instr Air Pen 311	D-302-273
*115.004	LR-01,02 03,04-H1	2	Leak Rate Test Sys Pneumatic Test	D-302-811
149.052	MS-01-H1	2/3	Main Stm & Stm Generator Hydro	D-302-011
149.053	MU-03-H1	2	Reactor Mkup F/Degasifier Hydro	D-302-791
149.054	MU-02-H1	2	Reactor Mkup Water Stor Tnk Hydro	D-302-791
149.055	MU-04-H1	2	Reactor Mkup Water Disch Pipe Hydro	D-302-791
115.020	ND-35-H1	2	Incore Sump Disch Pipe Hydro	D-302-821
115.020	NG-01-H2	2	Hydro Test Nitro Blanket Pen #313	D-302-311
149.056	RC-01-H1	1	Reactor Coolant System Cold Hydro	114E072
149.057	RC-01-H2	2	Reactor Vessel 'O' Ring Leakoff Hydro	114E072

ISI HYDRO AND/OR PNEUMATIC TESTING REFERENCE INDEX

STP NO.	SYSTEM(#)	CODE CLASS	DESCRIPTION	FLOW DWG.
149.058	RC-02-H1	2	Pressurizer Dead Weight Tester Hydro	114E072
149.059	RC-03-H1	1	RTD Bypass Loops Hydro	114E072
149.060	RC-05-H1	2	RC Pump Stand Pipe Makeup Hydro	114E072
149.061	RC-06-H3	3	N_2 Gas Supply to PRT Piping Hydro	114E072
149.062	RH-01-H1	2	RHR System Hydro	114E074
*115.013	SA-03-H2	2	Station Air RB Pen #310 Hydro	D-302-241
149.063	SF-01-H1	2	Static Test of RWST	D-302-651
149.064	SF-03-H1	2	SF Cool Train A&B Hydro	D-302-651
149.065	SF-04-H1	2	SF Cool Demin for Refueling Cavity Hydro	D-302-651
149.066	SI-01-H1	1	Safety Inject Highhead & BIT Hydro	114E075
149.067	SI-02-H1	3	Boron Inject Recirc Pump Suction Hydro	114E075
149.068	SI-02-H2	3	Static Test Boron Inject Surge Tank	114E075
149.069	SI-03-H1	2	RW ST Supp. to RHR, CVCS & RB Spr Pmps Hydro	114E075
149.070	SI-04-H1	2	RHR Pmp Suction from Cont Sump Hydro	114E075
*115.007	SI-04-H2	2	Penetration #329 Guard Pipe Hydro	114E075
*115.007	SI-04-H3	2	Penetration #425 Guard Pipe Hydro	114E075
149.071	SI-05-H1	2	SI Accumulators and Fill Line Hydro	114E075
149.072	SI-05-H2	2	N2 Supp Line to Accum & PORV 445A&B Hydro	114E075
149.073	SP-01-H1	2	RB Spray Pump Suction Piping Hydro	D-302-661

ISI HYDRO AND/OR PNEUMATIC TESTING REFERENCE INDEX

STP NO.	SYSTEM(#)	CODE CLASS	DESCRIPTION	FLOW DWG.
149.074	SP-02-H1	2	RB Spray Rings Hydro	D-302-661
149.075	SP-03-H1	2	RB Spray Pump Discharge Hydro	D-302-661
*115.017	SP-04-H1	2	Penetration #327 Guard Pipe Hydro	D-302-661
*115.017	SP-04-H2	2	Penetration #328 Guard Pipe Hydro	D-302-661
149.076	SP-05-H1	3	RB Spray Caustic Add Tank Static Test	D-302-661
*115.018	SS-01-H1	3	Sample Sys Lines from CVCS Lk Test	D-302-771
*115.018	SS-01-H2	3	Sample Sys Lines from RCDT Lk Test	D-302-771
*115.018	SS-02-H1	2	Sample Sys Lines from RHR Lk Test	D-302-771
*115.018	SS-04-H1	2	Sample Sys Lines from RCS Lk Test	D-302-771
*115.018	SS-05-H1	2	Sample Sys Lines from SI Accum Lk Test	D-302-771
149.077	SS-07-H1	2	Sample Sys Lines from S/G's Hydro	D-302-771
149.078	SW-01-H1	3	SW A Train Discharge	D-302-222
149.079	SW-01-H2	3	SW B Train Discharge	D-302-222
149.080	SW-01-H3	3	SW Pump A Discharge Hydro Test	D-302-221
149.081	SW-01-H4	3	SW Pump B Discharge Hydro Test	D-302-221
149.082	SW-01-H5	3	SW Pump C Discharge Hydro Test	D-302-221
149.083	SW-01-H8	3	SW Train A&B Disch to SW Pond Oper Test	D-302-222
149.084	SW-04-H1	2	SW Train A to RBCU Hydro	D-302-222
149.085	SW-04-H2	2	SW Train B to RBCU Hydro	D-302-222

ISI HYDRO AND/OR PNEUMATIC TESTING REFERENCE INDEX

STP NO.	SYSTEM(#)	CODE CLASS	DESCRIPTION	FLOW DWG.
149.086	VU-05-H1	3	Hydrotest Chilled Water Loop B	D-302-841
149.087	VU-06-H1	3	Hydrotest Chilled Water Loop A	D-302-841
149.088	WD-01-H1	3	Spent Resin Store Tank Supply	114E077
149.089	WD-04-H1	2/3	RC Drain Tank Pump Pipi - Hydro	114E077
149.090	WD-06-H.	3	Waste Holdup Tank Hydro	114E077
149.091	WD-06-H2	3	Waste Evaporator Feed Pump Piping Hydro	114E077
149.092	WD-10-H1	3	Waste Evap Package Hydro	114E077
149.093	WD-12-H1	3	Spent Resin Storage Trans Piping Hydro	114E077
149.094	WD-13-H1	3	Spent Resin Storage Tnk & Piping Hydro	114E077

The first two alpha digits identify the system.

* Relief Request see Attachment 7.5

"SYSTEM LEAK TESTING"

410 SERIES STP's

150.001	Reactor Coolant System Leak Test
150.002	Chemical and Volume Control System Leak Test
150.003	Safety Injection System Leak Test
150.004	Residual Heat Removal System Leak Test
150.005	Component Cooling Water System Leak Test
150.006	Reactor Building Spray System Leak Test
150.007	Service Water System Leak Test
150.008	"A" Emergency Diesel Generator Support System Leak Test
150.009	"B" Emergency Diesel Generator Support Systems Leak Test
150.010	Emergency Fedwater System Leak Test
150.011	Feedwater (Nuclear) System Leak Test
150.012	Main Steam/Steam Generators Leak Test
150.013	Chilled Water System Leak Test
150.014	Reactor Building Cooling System Leak Test
150.015	Spent Fuel Cooling System Leak Test.
150.016	Post Accident Hydrogen Removal and Alternate Purge System Leak Test
150.017	Boron Recycle System Leak Test
150.018	Reactor Makeup Water System Leak Test
150.019	Liquid/Solid Waste Disposal System Leak Test
150.020	Gaseous Waste Disposal System Leak Test

CODE CLASS 1, 2, and 3 SYSTEM PRESSURE TESTING
RELIEF REQUEST IDENTIFICATION

SYSTEM	RELIEF REQUEST NO.
(AC) CRDM Cooling System	2-AC-1
(AH) Air Handling	2-AH-1
(BA) Breathing Air System	2-BA-1
(DN) Demineralized Water System	2-DN-1
(FS) Fire Protection System	2-FS-1
(HR) Post Accident H_2 Removal System	2-HR-1
(IA) Instrument Air System	2-IA-1
(LR) RB Leak Rate Testing System	2-LR-1
(ND) Nuclear Drain System	2-ND-1
(RH) Residual Heat Removal	2-RH-1
(NG) Nitrogen Supply System	2-NG-1
(SS) Nuclear Sample System	2-SS-1
(SA) System Air System	2-SA-1
(SP) RB Spray	2-SP-1

APPENDIX J TESTING

SYSTEM	APPENDIX J TEST
(AC) CRDM Cooling	STP-115.029
(AH) Air Handling	STP-115.022
(BA) Breathing Air	STP-115.014
(DN) Demineralized Water	STP-115.025
(FS) Fire Protection	STP-115.023
(HR) Post Accident H_2 Removal System	STP-115.021
(IA) Instrument Air	STP-115.014
(LR) RB Leak Rate Testing	STP-115.004
(ND) Nuclear Drains	STP-115.020
(NG) Nitrogen Supply	STP-115.015
(RH) Residual Heat Removal	STP-115.008
(SS) Nuclear Sampling	STP-115.018
(SA) Station Service Air	STP-115.013
(SP) RB Spray	STP-115.017

SYSTEM OPEN/RECLOSE LEAK TEST RECORD

A. General

1. System ______________________

2. Item Description / I.D. Number / MWR No.

Item Description	I.D. Number	MWR No.

3. Justification

a. Replacement ☐ b. Rework ☐ c. Inspection ☐

d. Investigation ☐ e. Other ☐ ______________

QUALIFIED OPERATOR / DATE

B. Test Data

1. Nominal Operating Pressure ____________

2. Leak Test Pressure ____________

3. Instrument Serial No. ________ Cal. Due Date ________

4.

ITEM I.D. NO.	ITEM NOMINAL SIZE	LEAK RATE (cc/min)	MAX LEAK RATE (cc/min)	SAT	UNSAT
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐

QUALIFIED Q.C. INSPECTOR /
OR OPERATOR (VT-2 EXAMINER / DATE

Reviewed By: ISI COORDINATOR / DATE

SYSTEM OPEN/RECLOSE LEAK TEST ACCEPTANCE CRITERIA

* ITEM NOMINAL SIZE	MAXIMUM LEAKAGE (cc/min)
1/8"	10
1/4"	30
3/8"	50
3/4"	150
1"	200
1-1/2"	250
2	300
3	450
4	590
6	885
8	1180
10	1475
12	1769
14	2064
16	2359
18	2654
32	4718
36	5308
VESSELS	5308

* ITEM NOMINAL SIZE

A. Piping & Tubing - Nominal size of pipe as defined in ANSI B36.10 and ANSI 36.19

B. Pumps & Valves - Nominal pipe size of the inlet connection

NOTE: For those sizes not listed, the maximum leakage rate may be Extrapolated.

Code Class 1, 2 and 3 Pressure Testing Relief Request Index

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(AC) CRDM Cooling System

RELIEF REQUEST

2-AC-1

SYSTEM DRAWING NUMBER

D-302-852

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.029

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(AH) Air Handling, Reactor Building Purge Supply and Exhaust

RELIEF REQUEST

2-AH-1

SYSTEM DRAWING NUMBER

D-912-103

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.022

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(BA) Breathing Air System

RELIEF REQUEST

2-BA-1

SYSTEM DRAWING NUMBER

D-302-274

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.014

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(DN) Demineralized Water System

RELIEF REQUEST

2-DN-1

SYSTEM DRAWING NUMBER

D-302-715

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.025

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(FS) Fire Protection System

RELIEF REQUEST

2-FS-1

SYSTEM DRAWING NUMBER

D-302-231

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.023

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(HR) Post Accident H_2, Alternate Purge Supply and Exhaust

RELIEF REQUEST

2-HR-1

SYSTEM DRAWING NUMBER

D-302-861

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.021

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(IA) Instrument Air System

RELIEF REQUEST

2-IA-1

SYSTEM DRAWING NUMBER

D-302-273

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.014

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(LR) Reactor Building Leak Rate Testing System

RELIEF REQUEST

2-LR-1

SYSTEM DRAWING NUMBER

D-302-811

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.004

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(ND) Nuclear Drains System

RELIEF REQUEST

2-ND-1

SYSTEM DRAWING NUMBER

D-302-821

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.020

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(NG) Nitrogen Supply System

RELIEF REQUEST

2-NG-1

SYSTEM DRAWING NUMBER

D-302-311

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.015

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(RH) RHR Containment Sump Suction Guard Piping

RELIEF REQUEST

2-RH-1

SYSTEM DRAWING NUMBER

114E075 Sheet 3 of 5

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.008

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(SA) Station Air System

RELIEF REQUEST

2-SA-1

SYSTEM DRAWING NUMBER

D-302-241

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.013

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(SP) RB Spray Containment Sump Suction Guard Piping

RELIEF REQUEST

2-SP-1

SYSTEM DRAWING NUMBER

D-302-661

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rate testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.017

SYSTEM PRESSURE TESTING RELIEF REQUEST

SYSTEM

(SS) Nuclear Sampling System

RELIEF REQUEST

2-SS-1

SYSTEM DRAWING NUMBER

D-302-771

EXAMINATION REQUIREMENTS

System Leakage Test - The system Leakage Test shall be conducted at a test pressure not less than the nominal pressure associated with 100% rated Reactor Power.

System Hydrostatic Test - The system Hydrostatic Test shall be at least 1.10 times the system pressure Psv for systems with design temperature of 200°F. or less and 1.25 times the system pressure Psv for systems with design temperatures above 200°F. The system pressure Psv shall be the lowest pressure setting among the number of Safety or Relief valves provided for overpressure protection within the boundary of the system to be tested.

RELIEF REQUEST JUSTIFICATION

Portions of the above system have been classified as Nuclear Class 2 per current guidelines because it penetrates the Reactor Containment liner. This line segment will be tested during the Local Leak Rte testing program during each refueling cycle per Title 10 of the Code of Federal Regulations, part 50, Appendix J. This pressure test of 47.1 + 10-0 psig is intended to prove that the penetration can at least meet the requirements on the Containment pressure retaining capabilities. This test satisfies the requirements of the ASME Code Sub-Section IWC in proving the integrity of the code class piping; therefore, this line segment will not require a separate test per Section XI of the ASME Code.

ALTERNATE EXAMINATION

Appendix J. testing as described above. STP-115.018

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

STATION ADMINISTRATIVE PROCEDURE

SAP-304

ASME CODE, SECTION XI REPAIR PROGRAM

REVISION 0

JULY 12, 1982

NON-CONTROLLED COPY

Jim Turkett for Larry Cowick — 8-18-82
ORIGINATOR (of this revision) — Date

M D Quinton — 8-18-82
ASST MGR MAINTENANCE SERVICES — Date

Approved:
J G Connelly — 8/25/82
PLANT MANAGER — Date

REVIEWED BY PSRC

J G Connelly — 8/25/82
CHAIRMAN — DATE

Date Issued: AUG. 26 1982

LIST OF EFFECTIVE PAGES

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this procedure is to provide a repair program in conjunction with the Inservice Inspection Program at Virgil C. Summer Nuclear Station. This program is implemented to fulfill the repair requirements of ASME Code, Section XI.

2.0 SCOPE

This procedure is applicable to all Station organizational elements responsible for conducting repairs under the ASME Code, Section XI.

3.0 REFERENCES

3.1 10 CFR 50.55a

3.2 ASME Code Section III 1971 Edition through the Summer 1973 addenda for Code piping installation.

3.3 ASME Code Section III original Construction Code for valves, pumps, vessels and component supports.

3.4 ASME Code Section IX

3.5 ASME Code Section XI 1977 Edition through and including Summer 1978 addenda

3.6 Virgil C. Summer Nuclear Station Facility Operating License and Technical Specifications

3.7 South Carolina Electric and Gas Company Operational Quality Assurance Plan

3.8 SAP-145, Inservice Inspection Program

3.9 SAP-301, Maintenance Work Request

3.10 SAP-302, Administration of Maintenance Welding

4.0 DEFINITIONS

4.1 ASME Code - The ASME Boiler and Pressure Vessel Code, Section XI 1977 Edition through and including the Summer 1978 addenda.

4.2 Authorized Inspection Agency - An insurance company authorized to write boiler and pressure vessel insurance in the State of South Carolina.

4.3 Code Class - A classification of items and components based upon the Section III Code subsection used in the construction of items.

A. Class 1 - Subsection NB

B. Class 2 - Subsection NC

C. Class 3 - Subsection ND

D. Class MC - Subsection NE

E. Components Supports - Subsection NF

4.4 Construction - An all inclusive term requiring materials, design, fabrication, examination, installation, testing, inspection and certification be in accordance with the applicable Section III Code.

4.5 Indication - An expressed state of condition detected by the specified non-destructive examination method.

4.6 Flaw - An indication requiring evaluation by qualified personnel.

4.7 Rejectable Flaw - An evaluated indication of an item or component requiring repair, rework, monitoring, an analysis or a combination thereof.

4.8 Repair - Welding rework activities, including initial and final finishing processes, required to return an item to a condition acceptable to the Code.

4.9 Replacement - The addition of spare component(s) parts of component(s), appurtenances, piping subassemblies, rerouted piping but not the addition of new complete systems.

4.10 REWORK - Repair or replacement activities or a combination thereof required to return an item to a condition acceptable to the Code.

4.11 Recordable Indication - Same as the definition for "Flaw"

4.12 Rejectable Indication - Same as the definition for "Rejectable Flaw".

5.0 RESPONSIBILITY

5.1 The Manager, V.C. Summer Nuclear Station has the overall responsibility for the implementation of the Section XI Repair, Rework and Replacement Program.

5.2 The Assistant Manager - Maintenance Services is responsible for implementing repair, rework and replacement activities.

5.3 The Director of Station Quality Control (DSQC) or his designated alternate is responsible for:

5.3.1 Directing required non-destructive examination(s) specified for the applicable repair, replacement or rework activity.

5.3.2 Directing the preparation of the required non-destructive examination reports and attaching such reports or copies of reports to the applicable Maintenance Work Request.

5.3.3 Promptly notifying the ISI Coordinator or ISI Coordinator designated alternate(s) of any rejectable indications detected during inservice inspection.

5.3.4 Preparation and approval of other required Quality Control Records and Documents.

5.3.5 Performing any needed additional examinations and investigations for resolution and disposition of examination results.

5.3.6 Maintaining liaison with the ANII for any inspections required as a result of implementation of IWA-4140 of the Code.

5.4 The Inservice Inspection Coordinator is responsible for:

5.4.1 Coordinating those activities necessary to perform repairs needed as a result of rejectable indications detected during Inservice Inspection.

5.4.2 Initiating and completing the appropriate sections of Attachments I and II.

5.4.3 When copies of records are requested by the NRC submitting the "Record of Section XI Repair" packet to the Technical Services Coordinator.

5.5 The Welding Supervisor shall be responsible for:

5.5.1 Developing and maintaining a welding program that fulfills the requirements of the Code.

5.5.2 Selecting and assigning applicable Welding Procedure Specifications and qualified welders to perform the welding in accordance with the requirements of the program.

6.0 PROCEDURE

6.1 Welding to Code stamped items or components meeting all the requirements of ASME Section III Construction Code, including installation requirements, shall be performed in accordance with the requirements of SAP-302, WM-1, WM-2 and the applicable section of the Code.

6.2 Code rework or replacement activities not requiring welding shall be performed in accordance with approved maintenance procedures for the applicable component or item except as noted in 6.12.2.

6.3 Welding to shop fabricated Code stamped items not meeting the requirements of ASME Section III installation requirements need not meet the requirements of IWA-4140.

6.4 The Maintenance Work Request shall be used to initiate any repair, rework or replacement activity.

6.5 The "Record of Section XI Repair", Attachment I shall be initiated and completed in accordance with Section 6.10.9 of this procedure.

6.6 The "Index to Section XI Repair" shall be initiated and completed in accordance with Section 6.10.10 of this procedure.

6.7 Code repairs resulting in only mechanical defect removal may be performed in accordance with WM-1.0 under the control of the Q. C. Inspection Program and documented on an MWR.

6.8 Components identified as having recordable indications, flaws or other defects may be "Accepted as Is" only after evaluation has been performed by qualified personnel.

6.9 Prior to performing any Code welding the ANII will be contacted to establish inspection hold points as determined by applicable quality control procedures. This contact may be made by telephone conversation. If contact cannot be established repair activities may proceed at the discretion of the DSQC after documenting on Attachment I the date and time the attempt was made.

6.10 Documentation

6.10.1 Code repair, replacement or rework activities shall be initiated by completing the appropriate sections of the MWR in accordance with SAP-301.

6.10.2 Attachments I and II of this procedure shall be used to implement the applicable Code repair except as otherwise noted in paragraph 6.1 and 6.11.4.

6.10.3 SAP-302, WM-1.0 and WM-2.0 shall be used to control the Code repair activities.

6.10.4 Code replacement and rework activities may be implemented by completing the appropriate sections of Attachments I and II of this procedure.

6.10.5 When required by the MWR, safety tags shall be issued, completed and attached to the appropriate equipment in accordance with SAP-201.

6.10.6 When required by the MWR, Radiation Work Permits will be initiated, completed and posted in accordance with applicable Health Physics Procedures.

6.10.7 Only qualified welders using applicable qualified Welding Procedure Specifications are to be used in performing Code Welding.

6.10.8 When required, a modification request form shall be initiated and completed in accordance with SAP-133.

6.10.9 "Record Section XI Repair" Attachment I entries A.1 through A.5 are to be completed as follows:

A. Entry A.1 - Name and identification of the item.

B. Entry A.2 - Nature of problem or discrepancy of the item.

C. Entry A.3 - Method of detection of the discrepancy such as routine maintenance, type of NDE, hydrostatic test, leak test, etc.

D. Entry A.4 - When required, enter NCN #(s) for the item.

E. Entry A.5 - MWR #(s) for the applicable item or component

F. For entries A.1 through A.5 the ISI Coordinator or his designated alternate(s) shall verify entries are correct by affixing signature and date.

G. Entries B.1 through B.10 shall be checked or marked, as appropriate, for the type of repair, replacement, rework, etc. required for the described item. The Welding Supervisor or Maintenance Engineer, as applicable, shall affix signature and date to identify those required activities.

H. Entries C.1 through C.3 shall be checked, marked and/or completed, as appropriate, when actual contact or an attempt to contact the ANII was made for establishing inspection hold points for welded repairs.

I. Entry D - May be used by any individual involved with the repair, replacement, etc. to record information which may be worthwhile or meaningful in the production, inspection or final review of the specified activity.

K. Entries E.1 through E.5 - Review, approval and/or acceptance of described activities by those titled personnel identified.

6.10.10 "Index to Section XI Repair", Attachment II, lines and columns shall be completed by those departments and individuals responsible for initiating any document to be attached to the "Record of Section XI Repair".

6.11 Code Repair Activities

6.11.1 Code repair activities requiring welding shall be performed by welders qualified to use the applicable WPS's in accordance with the requirements of WM-1.0.

6.11.2 Alterations and/or modifications evolving from changes to existing design specifications or new design specifications resulting in welding activities to a Code item shall be initiated through as Engineering Change Notice or modification request form prepared in accordance with the requirements of the appropriate specifications, and controlled in accordance with SAP-133 and this procedure.

6.11.3 Repair activities required to return a Code item to its original design condition shall be performed in accordance with the original design specification and/or WM-1.0, as applicable.

NOTE: The ANII shall be notified in accordance with paragraph 6.9 of this procedure prior to performing any Code repair welding activities.

6.11.4 Mechanical removal of defects without subsequent welding may be performed under the scope of a MWR.

6.12 Code Rework and Replacement Activities

6.12.1 Code rework and/or replacement activities not requiring welding shall be performed in accordance with paragraph 6.2.

6.12.2 Alterations and/or modifications evolving from changes to existing design specifications or new design specifications resulting in rework or replacement activities shall be initiated through an Engineering Change Notice or modification request form prepared in accordance with the requirements of such specifications and controlled in accordance with SAP-133 and this procedure.

6.12.3 Code rework and replacement activities involving welding shall be performed in accordance with 6.11 of this procedure.

6.13 Repair, Rework and Replacement activities by external organization.

6.13.1 A contracted or subcontracted organization program shall either:

A. Meet the S.C.E.&G.Q.A. Program; or

B. Have their Q. A. Program approved by S.C.E.&G.Q.A.

6.13.2 Contracted or subcontracted personnel requiring access to the site must meet the requirements of SAP-108.

7.0 FIGURES

None

8.0 RECORDS

Records developed for this procedure are records of Section XI Repair Forms and the index to Section XI Repair Forms.

SECTION XI

COVER SHEET

RECORD OF SECTION XI REPAIR

A. GENERAL

1. Item Description and I. D. No.: ______________________
2. Discrepancy: ______________________
3. Detection Method: ______________________
4. NCN #(s) ______________ 5. MWR #(s) ______________
6. MRF # (s) ______________ 7. Other ______________

____
ISI COORDINATOR DATE

B. DISPOSITION

1. ____ Repair 2. ____ Replacement 3. ____ Rework
4. ____ Welding 5. ____ Mechanical Removal of Defect
6. ____ Accept As Is ____ Justification Attached
7. ____ Alteration or Modification ____ ECN or MR Attached
8. ____ Hydrotest 9. ____ Leak Test 10. ____ Other (Remarks)

____
WELD. SUPV. OR MECH ENGR. DATE

C. WELDING ACTIVITIES

1. ____ ANII Contacted ____ Telephone ____ On-Site
2. ____ Attempted Contact of ANII By ____________ Date/Time ______
3. ____ Hold Points Established By ____________ Date ______

____
D S Q C OR DESIGNEE DATE

D. REMARKS: ______________________
____
____

E. REVIEW, APPROVAL AND/OR ACCEPTANCE

1. ______________________
MECH. SUPERVISOR DATE

2. ______________________
WELD. SUPV. OR MECH. ENGR. DATE

3. ______________________
ISI COORDINATOR DATE

4. ______________________
D S Q C OR DESIGNEE DATE

5. ACCEPTANCE: ______________________
ANII DATE

MWR SHEET ____ OF ____

SECTION XI

SHEET ____ OF ____

INDEX TO SECTION XI REPAIR DATA

MWR #(s) ____________

DOCUMENT TITLE	PAGE NO.	SIGNATURE & DATE
Record of Section XI Repair	1	
Index to Section XI Repair	2	

MWR SHEET ____ OF ____

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

STATION ADMINISTRATIVE PROCEDURE

SAP-302

ADMINISTRATION OF MAINTENANCE WELDING

REVISION 0

JULY 12, 1982

NON-CONTROLLED COPY

Reviewed by:

Jim Turkett for Larry Cowler — 8-18-82

ORIGINATOR (of this revision) — Date

M D Quinton — 8-18-82

ASST. MGR. MAINTENANCE SERVICES — Date

Approved:

J G Connelly — 8/25/82

PLANT MANAGER — Date

Date Issued: AUG. 26 1982

REVIEWED BY PSRC

J G Connelly — 8/25/82

CHAIRMAN — DATE

LIST OF EFFECTIVE PAGES

TABLE OF CONTENTS

1.0 PURPOSE

This procedure establishes the means for developing, implementing and maintaining the controls for the Maintenance Welding Program.

2.0 SCOPE

This procedure is applicable to Station organizational elements which conduct maintenance welding or brazing. Unless otherwise noted throughout this procedure the terms "process", "procedure specifications" and "welder" apply equally to welding and brazing.

3.0 REFERENCES

3.1 10 CFR Part 50.55a.

3.2 10 CFR Part 50, Appendix B.

3.3 ASME Boiler and Pressure Vessel Code Section III 1971 Edition through Summer 1973 Addenda for code piping installation and original construction requirements for other code items.

3.4 ASME Boiler and Pressure Vessel Code, Section IX.

3.5 ASME Boiler and Pressure Vessel Code, Section XI 1977 Edition through Summer 1978 addenda.

3.6 Virgil C. Summer Nuclear Station Facility Operating License and Technical Specifications.

3.7 Virgil C. Summer Nuclear Station Final Safety Analysis Report.

3.8 ANSI B31.1 Piping Code 1967 Edition and Addenda through 1972.

3.9 American Welding Standard D1.1, 1972 and revision through 1974.

3.10 South Carolina Electric and Gas Company Operational Quality Assurance Plan.

3.11 SAP-103, Statement of Responsibilities, Maintenance Services.

3.12 SAP-301, Maintenance Work Request.

4.0 DEFINITIONS

4.1 ASME Code - An approved ANSI document published by the American Society of Mechanical Engineers including, but not limited to specific construction requirements, pre-service inspection requirements and in-service inspection requirements for certain classified pressure systems, components and their supports.

4.2 Authorized Nuclear Inservice Inspector (ANII OR ANI) - An inspector employed by an insurance company authorized to write boiler and pressure vessel insurance and having qualified in accordance with the requirements of ANSI/ASME N626.1-1975.

4.3 Brazing Procedure Specification (BPS) - A documented record of the brazing variables, both essential and non-essential, and proven applicable test or tests, and also the acceptable ranges of these variables.

4.4 Procedure Qualification Record (PQR) - A certified record of the actual welding or brazing variables experienced during the qualification of a WPS.

4.5 Standard Qualification Test (SQT) - A specific welding or brazing test performed by a welder or brazer permitting that welder or brazer to use one or more WPS's or BPS's, respectively.

4.6 Welding Manual 1 (WM-1) - A written approved document, although separate, complimentary to the Welding Procedure Specification or Brazing Procedure Specification, to be used in performing weld or braze testing, maintenance welding or brazing, and repair welding and brazing.

4.7 Welding Manual 2 (WM-2) - A written approved document to be used in the procurement, issuance and control of welding and brazing material.

4.8 Welding Procedure Specification(WPS) - A documented record of the welding variables, both essential and non-essential, and proven applicable test or tests and also the acceptable ranges of these variables.

5.0 RESPONSIBILTY

5.1 Through and under the direction of the Assistant Manager, Maintenance Services, the Welding Supervisor is responsible for performing those activities necessary to establish, implement, control and maintain the Maintenance Welding Program. These activities include, but are not limited to, the training of welders, welding operators and the welding foreman; the appropriate origination, issuance, qualification, revision, control and application of the WPS's, PQR's and SQT's and other correlating applicable documents and procedures in accordance with the applicable codes. In addition, the Welding Supervisor, in conjunction with the Materials Supervisor, has the responsibility for procurement, field issuance and control of any welding materials used in any welding processes on any code item, safety related system or component.

5.2 The Materials Supervisor or his designee, through and under the direction of the Assistant Manager, Maintenance Service and in conjunction with the Welding Supervisor or his designee has the responsibility for procurement, warehouse issuance and warehouse control of any materials to be used in any welding processes on any code item, safety-related system or non-safety related system or component.

5.3 The Director of Station Quality Control has the responsibility for verifying the required destructive testing and for performing non-destructive testing of welded coupons, production welds and repair welds.

5.4 Under the direction of the Welding Supervisor, the welding foreman has the responsibility to direct the on-location welding activities including, but not limited to, assisting in welder training and qualification and application of WPS's.

5.5 Under the direction of the Welding Supervisor and/or the welding foreman the welders and welding operators have the responsibility for reviewing, following and adhering to the requirements of the applicable WPS's, WM-1 and WM-2.

5.6 The Mechanical Supervisor has the responsibility for providing support to the Welding Supervisor and the Director of Station Quality Control in the processing of weld test specimens. These processing activities include, but are not limited to, fabrication of weld test booths, machining, grinding and preparation of pre weld and subsequent post weld specimens.

6.0 PROCEDURE

6.1 This procedure and the welding manuals, WM-1 and WM-2, are prepared to establish and implement uniform standard applicable to code, safety-related and non-safety-related requirements. Documentation and control requirements mandate the need for this program in order to perform plant welding activities. Such requirements reduce errors and subsequent equipment downtime and thus promote and sustain the required standard of quality.

6.2 Each welder, welding operator and welding foreman shall receive training in the application of the WPS(s) and the applicable portions of WM-1 and WM-2 prior to his performing code or safety-related welding activities. This training will consist of both classroom and on-the-job instructions consistent and commensurate with their existing knowledge, experience and understanding of the welding process involved.

6.3 Welding material issue personnel shall receive training in the proper methods of storage, issuance, and proper disposition of returned used and unused welding electrodes. This training will be consistent with their knowledge, experience and understanding of material control requirements.

6.4 Semi-annually each welder, welding operator and the welding foreman shall receive instruction in the ASME Section IX Code Addenda changes which affect the Maintenance Welding Program.

6.5 Training exercises will be documented in accordance with WM-1 and/or WM-2 as applicable.

6.6 Documentation

6.6.1 Initiation, origination, revision and approval of this procedure, WM-1, WM-2, and WPS's shall be in accordance with SAP-139. PQR's and SQT's shall be reviewed and approved in accordance with this procedure. WPS's and PQR's shall be reviewed by Quality Assurance and Quality Control prior to issuance. SQT's shall be reviewed by Quality Control prior to issuance. WPS's, PQR's and SQT's shall be approved by the Assistant Manager, Maintenence Services prior to issuance.

6.6.2 WPS's, PQR's, and SQT's, are Station Records and shall be handled in accordance with SAP-150. Copies of the latest revision to WPS's, PQR's and SQT's shall be maintained under the direction of Welding Supervisor.

6.6.3 The Maintenance Work Request (MWR), issued to initiate welding activities, shall be completed and filed in accordance with SAP-301.

6.6.4 When required by the MWR, a Radiation Work Permit will be initiated and completed in accordance with Health Physics Procedures.

6.6.5 When required by the MWR, safety tags shall be issued, completed, attached to appropriate equipment and filed in accordance with SAP-201.

6.6.6 When required as noted in 6.8.6, a Modification Request Package shall be initiated and completed in accordance with SAP-133.

6.6.7 The weld traveler and the welder performance continuity record shall be issued, completed and filed in accordance with WM-1. These documents are described in WM-1.

6.6.8 The welding material receiving record, holding oven temperature record, welding material requisition record, and the portable caddie temperature verification record shall be issued, completed and filed in accordance with WM-2. These documents are described in WM-2.

6.7 Material Control

6.7.1 Welding and brazing material used in welding and brazing activities shall be procured, received, issued and controlled in accordance with WM-2. In addition procured and received welding and brazing material shall meet the requirements of the applicable purchase requisition.

6.7.2 The Welding Supervisor or his designated alternate will complete and submit a purchase requisition for approval in accordance with SAP-137 for brazing and welding material.

6.7.3 Any non-conforming welding material, brazing material or any item in which non-conforming welding or brazing material was used will be tagged and, if practicable, segregated as such and resolved as required by A-NQCP-2.

6.7.4 Radioactive contaminated welding or brazing material shall either be decontaminated and returned to the storage area for reuse or discarded in accordance with Health Physics Procedures.

6.7.5 Welding and brazing material issue personnel shall receive re-training annually or within 30 days of a new revision to WM-2.

6.8 Welding and Brazing Activities

6.8.1 Safety related and code welding or brazing shall be performed by welders/welding operators or brazers qualified to use the applicable WPS(s) or BPS(s) respectively, in accordance with WM-1.

6.8.2 Only applicable qualified WPS(s) or BPS(s) supported by one or more referenced PQR(s) shall be used in performing safety-related or code welding and brazing.

6.8.3 Any welder/welding operator or brazer determined to be lacking in the ability to produce the required weldment or brazed joint, respectively, shall have his qualification revoked in accordance with WM-1.

6.8.4 Any WPS(s) or BPS(s) determined to be lacking in the required characteristics (e.g. material) to produce the required weldment or brazed joint, respectively, shall have its qualification revoked in accordance with WM-1.

6.8.5 Requalification and renewal of qualification, if required, of welder/welding operators, welding foreman, WPS(s), and BPS(s) shall be in accordance with WM-1.

6.8.6 Modifications or alterations evolving from changes to existing design specifications or new design specifications resulting in welding activities to a Code or safety-related items shall be performed in accordance with the requirements of such specifications, and shall be in accordance with SAP-133 and this procedure.

Welding activities, including weld repairs, required to return a Code or safety-related item to its original design condition shall be performed in accordance with the original design specification and/or WM-1, as applicable.

6.8.7 Upon receiving or initiating an appropriate Maintenance Work Request the Welding Supervisor or his designated alternate(s) will initiate a weld or brazing traveler, select the applicable WPS(s) or BPS(s), welders or brazers respectively, to perform the code or safety-related welding or brazing activity respectively.

6.8.8 After the weld traveler or brazing traveler has been initiated and any required ASME Section XI Code documentation has been initiated, the welding or brazing activity may start under the direction of the Welding Supervisor or his designated alternate.

6.8.9 The ANII will be notified of all ASME Section XI Code welding or brazing activities in accordance with SAP-304.

6.8.10 After the welding or brazing has been completed, the required NDE has been performed and accepted, and the hydrostatic test, the pnuematic test, or hydrostatic-pneumatic test if required, has been completed and accepted in accordance with the applicable Mechanical Maintenance Procedure and the modification, if required, has been closed, the documentation shall be filed in accordance with SAP-150.

6.9 Welding By External Organizations (Subcontractors)

6.9.1 A subcontracting organizations welding program shall either:

A. Meet the requirements of the Operational Quality Assurance Plan or
B. Have their own Quality Assurance Program approved by the Manager, Quality Assurance.

6.9.2 All documents related to ASME Section XI Code welding or brazing activities shall be made available to the ANII for his review.

6.10 Authorized Nuclear Inservice Inspector

6.10.1 The Authorized Nuclear Inservice Inspector is responsible for performing his duties in accordance with the referenced ASME Section XI Code.

6.10.2 The interface to be maintained for ASME Section XI Code welding activities with the ANII is specified in procedure SAP-304.

7.0 FIGURES

None

8.0 RECORDS

Records generated in accordance with this procedure are identified in Section 6.6.1.

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

WELDING MANUAL PROCEDURE

WM-1.0

REVISION 2

JUNE 8, 1982

NON-CONTROLLED COPY

SAFETY RELATED

Larry B. Collier 10-27-82
ORIGINATOR (of this revision) Date

A.P. Durbeault 10-27-82
QUALIFIED REVIEWER Date

Approved:

M D Quinton 10-27-82
ASSIST. MGR. MAINTENANCE SERVICES Date

Date Issued: OCT 29 1982

Form AP-101-2 (1/80)

LIST OF EFFECTIVE PAGES

PAGE	REVISION
i	2
ii	2
iii	2
iv	2
v	2
vi	2
vii	2
1	2
2	2
3	2
4	2
5	2
6	2
7	2
8	2
9	2
10	2
11	2
12	2
13	2
14	2
15	2
16	2
17	2
18	2
19	2
20	2
21	2
22	2
23	2
24	2
25	2
26	2
27	2
28	2
29	2
30	2
31	2
32	2
33	2
34	2
35	2
36	2
37	2
38	2
39	2

LIST OF EFFECTIVE PAGES (con't)

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

PAGE

Figures

TABLE OF CONTENTS

Attachments

1.0 PURPOSE OR SCOPE

1.1 This procedure provides the necessary rules for controlling welding and brazing activities, thus ensuring the requirements have been met for code, safety-related, and non-safety related components, equipment structures, and piping systems installed in the plant or to be installed in the plant.

2.0 REFERENCES AND GLOSSARY

2.1 References.

2.1.1 Administration of Maintenance Welding SAP-302 and latest approved revision.

2.1.2 Control and Calibration of Measuring and Test Equipment SAP-141 and latest approved revision.

2.1.3 Guidance for Documentation of Plant Staff Training-AP-1101 and latest approved revision.

2.1.4 Qualification and Certification of Quality Control Inspection Personnel A-NQCP-8 and latest approved revision.

2.1.5 Solvent Removable Liquid Penetrant Examination T-NQCP-2 and latest approved revision.

2.1.6 Water Washable or Post Emulsifiable Liquid Penetrant Examination T-NQCP-3 and latest approved revision.

2.1.7 High Temperature Liquid Penetrant Examination T-NQCP-4 and latest approved revision.

2.1.8 Magnetic Particle Examination for Prod and Coil Methods T-NQCP-5 and latest approved revision.

2.1.9 Magnetic Particle Examination for Yoke Method T-NQCP-6 and latest approved revision.

2.1.10 Visual Examination Series T-NQCP-7 and latest approved revision.

2.1.11 Eddy Current Examination of Steam Generator Tubing T-NQCP-8 and latest approved revision.

2.1.12 Radiographic Inspection T-NQCP-9 and latest approved revision.

2.1.13 Qualification of Welders and Welding Procedures T-NQCP-11 and latest approved revision.

2.2 Glossary.

2.2.1 Arc Welding-a group of welding processes wherein coalescence is produced by heating with an electric arc or arcs, with or without the application of pressure and with or without the use of filler metal.

A. Gas Metal-Arc Welding - (GMAW) (MIG) Coalescence produced by heating with an electric arc between a consumable metal electrode and the base material. Sheilding is obtained from an inert gas and/or a flux core.

B. Gas Tungsten-Arc Welding - (GTAW) (TIG) Coalescence produced by heating with an arc between a single non-consumable tungsten electrode and the base material. Shielding is obtained from a gas or a gas mixture, and filler metal shall be used.

C. Shielded Metal-Arc Welding-(SMAW) Coalescence produced by heating with an arc between a consumable covered metal electrode and the base material. Sheilding is obtained from decomposition of the electrode covering and filler metal is obtained from the electrode.

2.2.2 Brazing-A metal joining process wherein coalescence is produced by the use of a non-ferrous filler metal having a melting point above 800°F but lower than that of the base metals joined. The filler metal is distributed between the closely fitted surfaces by capillary action.

2.2.3 Brazing Flow Position-The orientation of the brazed joint with respect to the planes of the work piece.

A. Flat flow-Work pieces mated horizontally with filler metal flowing between two flat surfaces.

B. Horizontal flow-Work pieces mated vertically wih the filler metal flowing horizontally between the two surfaces.

C. Vertical Upflow-Work pieces mated vertically with the filler metal flowing vertically uphill.

2.2.4 Capillary Action-The force of attraction between two closely mated solid surfaces and a liquid.

2.2.5 Cladding-Deposition of filler metal onto a metal to obtain different desired chemical or physical properties from the original metal.

2.2.6 F'ller Metal-The metal to be added in a welded or brazed joint or surface deposition.

2.2.7 Fillet Weld-A weld of approximately triangular cross-section joining two surfaces approximately at right angles to each other in a lap joint, tee joint, or corner joint.

2.2.8 Groove Weld-A weld made in a groove between two members to be joined.

2.2.9 Groove eld Position-1G through 6G and 6GR as described.

A. 1G-Work piece in horizontal plane with the weld metal deposited from above.

B. 2G-Work piece in vertical plane with axis of weld horizontal.

C. 3G-Work piece in vertical plane with axis of weld vertical.

D. 4G-Work piece in horizontal plane with the weld metal deposited from underneath.

E. 5G-Pipe with its axis horizontal with the welding groove in a vertical plane.

F. 6G-Pipe with its axis inclined at 45 degrees. Welding performed without rotating the pipe.

G. 6GR-Pipe with its axis inclined at 45 degrees, with an installed restriction located 1/2" on the upper side of the groove.

2.2.10 Inspection Point-A point during welding or brazing operations at which verification for the welding or brazing activities is performed.

A. Hold Point-A previously selected inspection point beyond which the operation cannot proceed until verification of the activity has been performed by authorized personnel.

B. Witness Point-A previously selected inspection point beyond which the operation cannot proceed without authorization by the Quality Control Inspection Coordinator, or his designated alternate or the ANII, as applicable.

2.2.11 Indication-An expression of the state of the condition.

A. Linear Indication-An indication in which the length is more than 3 times the width.

B. Rounded Indication-An indication which is circular or elliptical with the length 3 times the width or less.

2.2.12 Notch Toughness Tests-A test or group of tests performed in which a metal specimen is destructively examined to determine its suitability for operation at various load and temperature conditions.

2.2.13 Preheat Temperature-The specified temperature which the base metal must attain in a welding, brazing or thermal cutting operation immediately before these operations are performed.

2.2.14 Post Weld Heat Treatment-The application of heat at a predetermined temperature to a metal section subsequent to a welding operation in order to relieve a major portion of the residual stresses.

2.2.15 Variables-A change in the characteristics which would either effect or not effect the quality of the intended use of the weld or braze joint.

A. Essential Variable-A change requiring requalification of a WPS or BPS.

B. Non-essential Variable - A change which does not require requalification of a WPS or BPS.

C. Supplementary Essential Variable - A change requiring requalification of a WPS only when notch toughness test properties are required for a particular application.

2.2.16 WPS Designation Definitions and/or abbreviations.

A. Gas Tungsten Arc Welding-GT

B. Shielded Metal Arc Welding-SM

C. Gas Metal Arc Welding-GM

D. P-Number Grouping-a distinctive group of base materials identified by ASME Section IX Code as having compatible physical and chemical properties for specified welding applications.

E. Basic weld Joint Types

O-Open Butt
•-Backing ring, strip on tape
B-Backing ring, strip on tape
C-Consumable Insert

F. F-Number Grouping-a distinctive group of Welding filler metals and/or electrodes identified by ASME Section IX Code as having basic fundamental usability characteristics in the qualification of welders and procedures.

G. A-Number Grouping-a distinct classification of ferrous weld metal chemical analysis for procedure qualification as identified by ASME Section IX Code.

H. Basic Thickness Application-Two specified ranges defined as follows:

1. LIGHTWALL (L)-up to and including 3/4" thickness, however, within the limits of the applicable WPS.

2. HEAVYWALL (H)-From 3/16" or greater to that maximum thickness limit(s) specified on the WPS.

I. Impact Properties (I) - Notch toughness tests such as charpy V-notch or drop weight tests specified by the code or its references.

J. Post Weld Heat Treatment (P)-If required by the WPS application

3.0 RESPONSIBILITIES

3.1 Procedure SAP-302 establishes, describes and delineates the responsibilities associated with the Maintenance Welding Program.

4.0 GENERAL (TRAINING)

4.1 Ample on-the-job training and classroom instruction shall be provided to all welders and brazers in order to improve the understanding of processes, grooming techniques and to emphasize safety and material control requirements.

4.2 Prior to his becoming qualified, each welder/welding operator and brazer will be instructed in the proper application of this procedure and the appropriate WPS(S).

4.3 For his appropriate qualified welding or brazing processes, each welder or brazer will be permitted to perform a minimum of 3 hours of welding per 90 calendar days or a minimum of 3 hours of brazing per 180 calendar days to maintain continuity of welding or brazing and quality craftsmanship. Should his qualification lapse, renewal shall be in accordance with Section 5.0 of this manual.

4.4 When the welder's or brazer's qualification has been revoked in accordance with this procedure and the cause can be justifiably corrected, retraining shall be provided. This retraining shall be in accordance with Section 5.0 of this manual.

4.5 Welding activity safety classes will be held monthly for the welders, brazers and those personnel involved with pre-weld or post-weld activities consistent and commensurate with previous training and experience.

4.6 Welding evolutions such as "Limited Position" and/or "Limited Space" may require mock-up training in order to improve craftsmanship, reduce radiation exposure and work costs, emphasize safety, and minimize rework or repairs.

4.7 Personnel assisting the welders or brazers will receive instruction in the applicable sections and subsections of this manual which affect the pre-weld and post-weld activities prior to their being used in such activities.

4.8 Training exercises will be documented in accordance with AP-I101 and Attachment VIII of this manual.

5.0 PROCEDURE

5.1 Qualification of WPS's and BPS's.

5.1.1 WPS or BPS qualifications are performed to ensure the required properties of the WPS or BPS, respectively, are reproduced during the application of its intended use.

5.1.2 The WPS or BPS, Attachments I and II respectively, shall be presented in either tabular or written form and shall describe in detail all the variables which are essential, supplementary essential (when required), and non-essential to the welding processes employed.

5.1.3 Changes may be made in the non-essential variables to suit production requirements without requalification of the procedure, provided such changes are documented either in an amendment to the original WPS or BPS, or a new WPS or BPS. Non-essential variable changes documented on an existing WPS or BPS shall be included as a revision to the WPS or BPS respectively.

5.1.4 All WPS(s) or BPS(s) shall be supported by one or more PQR(s), Attachment III and IIIA, and vice versa.

5.1.5 WPS(s) or BPS(s) shall be requalified and the test results recorded on a separate PQR whenever there is to be a change in an essential variable.

5.1.6 Requalification of revoked WPS(s) or BPS(s) shall follow the same format as original qualifications. However, code interpretations, code cases, and/or currently developed methods and techniques may be used for requalification.

5.1.7 Essential variables shall be indicated on the WPS(s) or BPS(s) with the upper case letter "E" used as a prefix to the applicable essential variable. For supplementary essential variables an asterisk shall be used to identify the applicable variable(s).

5.1.8 The WPS designation will generally take the form of either 8, 9, 12 or 13 alpha-numerical digits. However, the number of digits may vary using the same logic described herein.

A. <u>8 Digit Designations</u>

1. The first two digits identify the process.
2. The third and fourth digits identify the P-Number grouping of the base materials being joined.
3. The fifth digit identifies the basic type of weld joint.
4. The sixth and seventh digits identify the welding electrode F-Number grouping and A-Number grouping respectively.
5. The eighth digit identifies the basic thickness application.

B. <u>9 Digit Designations</u>

1. The first eight digits are as defined in <u>5.1.8 (A)</u>.
2. The ninth digit identifies whether PWHT is required for the intended application.

C. <u>12 Digit Designations</u>

1. The first two digits identify the process to be used first during the welding activity.
2. The third and fourth digits identify the second process to be used during the welding activity.
3. The fifth and sixth digits identify the P-Number grouping of the base materials being joined.
4. The seventh digit identifies the basic type of weld joint.
5. The eighth and tenth digits identify the F-Number grouping of the welding electrodes for each of the two welding processes.

6. The ninth and eleventh digits identify the A-Number grouping of the welding electrodes for each of the two welding processes.

7. The twelfth digit identifies the basic thickness application.

D. <u>13 Digit Designation</u>

1. The first twelve digits are as defined in 5.1.8 (C).

2. The thirteenth digit identifies whether PWHT is required for the intended application.

5.1.9 A copy of the WPS(s) or BPS(s) shall be available to the welder/welding operator or brazer, respectively, for reference during any code or safety related welding activity.

5.2 Procedure Qualification Tests (ASME Section III and Section IX Codes).

5.2.1 The type and number of test specimens which must be tested to qualify a WPS or BPS shall be removed and tested in accordance with ASME Section IX Code, and, if applicable, ASME Section III Code. The procedure qualification tests shall encompass the thickness ranges to be used in production for the base metals to be joined or repaired. Essential variables are specified in both ASME Section III and Section IX Code.

5.2.2 Except for vessels or parts of vessels constructed of P-NO.11 (excluding P-NO. 11A GR.1 and 2) metals, WPS qualification tests shall qualify the WPS for use with groove welds within the range of the essential variables listed and shall also qualify for use with fillet welds in all thicknesses of metal, sizes of fillet welds, and diameters of pipe or tube within the limits of the other remaining essential variables.

5.2.3 Qualification of a BPS in the flat-flow, vertical-upflow, and horizontal-flow shall also qualify for the vertical-downflow position. A special orientation flow shall qualify only for that flow position.

5.2.4 For Gas Metal Arc Welding, Shielded Metal Arc Welding, and Gas Tungsten Arc Welding processes, the position of the test specimen shall be a supplementary essential variable when changing from any position to the vertical-uphill position.

5.2.5 Except as otherwise specified by ASME Section III Code and in 5.2.4 above, a WPS(s) qualification in any position qualifies the WPS(s) for all positions.

5.2.6 Qualification of the BPS in pipe also qualifies for plate, but not vice versa.

5.2.7 WPS(s) qualified on groove welds shall be also applicable for weld repairs to groove and fillet welds and for weld buildup under the following provisions:

A. There is no limitation on the minimum depth of deposited weld metal;

B. The upper limit for base metal thickness shall be in accordance with the WPS;

C. Qualification on 1 1/2" thickness or greater base metal shall also qualify to permit welding on unlimited thickness;

D. The other remaining essential variables of the WPS are in accordance with ASME Section III Code and ASME Section IX Code.

E. Cavity preparation shall be in accordance with 5.14.

5.2.8 WPS(s) qualified on groove welds shall be applicable for production welds between different base metal thicknesses provided:

A. The thickness of the thinner joint be within the range permitted by the WPS;

B. The thickness of the thicker member be within the range permitted by the WPS;

C. There is no limitation on the maximum thickness of the thicker member, providing qualification was made on base metal having a thickness of 1 1/2" or more;

D. More than one PQR may be required to qualify for some different thickness combinations;

E. The other remaining essential variables of the WPS are in accordance with ASME Section III and Section IX Codes.

5.2.9 WPS qualification tests for stud welds shall be conducted in accordance with ASME Section III and Section IX Codes.

5.2.10 WPS qualification tests for corrosion weld metal overlay, hard surfacing, specially designed welded seals, and tube-to-tubesheet welds shall be conducted in accordance with ASME Section III and Section IX Codes.

5.2.11 BPS processes and the brazing filler materials must be compatible and suitable, respectively, for their use in specific flow positions and shall be in accordance with ASME Section III and Section IX Codes.

5.2.12 The BPS test coupon shall be brazed using the joint design details specified in the captioned BPS.

5.3 Welding and Brazing Standard Qualification Tests (ASME Section III and Section IX Codes).

5.3.1 The welding or brazing SQT(s) are intended to determine the ability of the welders/welding operators or brazers/brazing operators to make sound welds or brazed joints, respectively, within the limits of the applicable essential variables.

5.3.2 A welder/welding operator or brazer/brazing operator shall be qualified to the process following the applicable WPS or BPS, respectively, during the qualification test. The results of welder's/welding operator's or brazer's/brazing operator's qualification test shall be recorded on the SQT forms, Attachments IV and VII, respectively.

5.3.3 A welder/welding operator or brazer/brazing operator performing the welding or brazing to qualify the WPS or BPS, respectively, is also qualified to perform welding or brazing using that WPS or BPS, respectively. However, the brazer/brazing operator using the BPS is qualified for that position only. The results of these welding or brazing tests shall also be recorded on Attachments IV and VII, respectively.

5.3.4 The type and number of test specimens for welded and brazed joint testing shall be removed and tested in accordance with ASME Section IX Code and, when required, ASME Section III Code.

5.3.5 Brazing SQT on plate in the flat-flow, vertical-upflow, or horizontal-flow positions shall qualify for the vertical-downflow position. Brazing SQT on pipe position shall qualify for plate positions, but not vice versa.

5.3.6 Within the limits specified by ASME Section IX Code, the welder's/welding operator's test specimens shall be inspected in accordance with T-NQCP-11.

5.3.7 Groove weld SQT both in the 2G and 5G position, or in the 6G position, shall qualify for all positions, except as specified by paragraph 5.3.8.

5.3.8 A welder/welding operator or brazer/brazing operator qualified to weld or braze, respectively, in accordance with one qualified WPS or BPS is also qualified to weld or braze in accordance with other qualified WPS(s) or BPS(s), respectively, using the same welding or brazing process, respectively, within the limits of the essential variables specified by ASME Section III and Section IX Codes, except for the stud welding and electron beam welding processes. This objective evidence shall be recorded on the SQT forms, Attachments IV and VIII, respectively.

5.3.9 Welders/welding operators, who pass the tests for groove welds, shall also be qualified to make fillet welds of any size on base metals in all thicknesses and pipe diameters within the limits of other essential variables for that process.

5.3.10 Stud welding qualification in the 4S position also qualifies for the 1S position. Qualification in the 4S position and 2S position qualifies for all positions.

5.3.11 A special orientation position qualification test for welding or brazing by a welder/welding operator or brazer/brazing operator, respectively, shall qualify only for that position.

5.3.12 When the welder/welding operator or brazer/brazing operator has not used the specific process for a minimum of 3 hours per 90 calendar days or a minimum of 3 hours per 180 calendar days, respectively, except when employed on some other process for a minimum of 3 hours per 90 calendar days or a minimum of 3 hours per 180 calendar days, respectively, requalification of that welder/welding operator or brazer/brazing operator is required prior to his performing welding or brazing activities on code or safety-related items. Continuity of welding shall be recorded on the Welder Performance Continuity Record, Attachment V.

5.3.13 At the discretion of the Welding Supervisor, a welder/welding operator or brazer/brazing operator, who fails his test, may be retested under the following provisions:

A. An immediate retest may be conducted and the welder/welding operator or brazer/brazing operator shall make two test specimens for each test he failed or;

B. The welder/welding operator or brazer/brazing operator may be given a minimum of 6 hours additional training. Upon completion of the training the welder/welding operator or brazer/brazing operator shall repeat each test previously failed.

5.3.14 When the welding supervisor has specific reason to question the welder's/welding operator's or brazer's/brazing operator's ability to make welds or brazed joints, respectively, that meet the requirements, requalification of that welder/welding operator or brazer/brazing operator for the applicable processes is required prior to his performing welding or brazing activities on code or safety-related items. The welding supervisor may consult with Quality Control prior to making this decision.

5.3.15 A welder's/welding operator's or brazer's/brazing operator's renewal of qualification for a specific process, under paragraph 5.3.12, may be made in only a single test joint, plate or pipe. The welding may be accomplished on any thickness, position, or material to reestablish the welder's/welding operator's qualification for any thickness, position or material for which he was previously qualified. The brazing may be accomplished using any one of the brazer's/brazing operator's previous qualification test joints utilizing all of the essential variables of the previous qualification. A minimum of 3 hours of welding or 3 hours of brazing, including practice or training, to reestablish the welding or brazing qualifications is required. This brazing activity will reestablish the brazer's/brazing operator's qualification for all conditions for which he had previously qualified with the specific brazing process.

NOTE: If at any time during the welder's/brazer's qualification testing or production welding/brazing a qualified Certified Quality Control Welding Inspector determines a welder/welding operator's or brazer/brazing operator's performance to be unacceptable, the inspector has the authority to suspend further testing or request revocation of his certifications, respectively. In the case of qualification testing, resumption of test shall be in accordance with 5.3.13 of this procedure.

5.3.16 Requalification for a specific welding or brazing process, under paragraph 5.3.14, shall meet the same requirements as the original qualification.

5.3.17 A record of the welder's/welding operator's or brazer's/brazing operator's work shall be kept on the applicable weld or brazing traveler, and, when permitted, welders or brazers may use assigned low stress stamps or etching devices to identify their respective welding or brazing activities.

NOTE: Stamping on ferrous materials 1/4" thick and less and on non-ferrous materials 1/2" thick and less is not permitted.

5.3.18 A record of assigned stamp number and/or symbols shall be maintained by the Welding Supervisor, or his designated alternate, on Attachment V.

5.3.19 Upon evaluation of circumstances as determined by the Welding Supervisor, a welder/welding operator or brazer/brazing operator, who has a 10% or more reject rate, may be required to requalify to those processes for which the rejection criteria is applicable.

5.4 Procedure Qualification Tests (AWS D1.1 Safety-Related).

5.4.1 The type and number of test specimens, if required, shall be removed and tested in accordance with AWS D1.1 Code.

5.4.2 Unless otherwise specified by this procedure, ASME Section IX Code qualified WPS(s) may be used for AWS D1.1 applications.

5.4.3 There shall be no Gas Tungsten Arc Welding processes or GTAW WPS's used for AWS D1.1 applications. Only Shielded Metal Arc Welding processes may be used for AWS D1.1 applications.

5.4.4 The Welding Supervisor shall select the ASME Section IX Code qualified WPS(s) to be used for each AWS D1.1 application. These Section IX Code qualified WPS(s) shall conform to AWS D1.1 code requirements.

5.5 Welding Standard Qualification Tests (AWS D1.1 Safety-Related).

5.5.1 All welders/welding operators to be employed for this application shall have been qualified in accordance with AWS D1.1 Code.

5.5.2 A welder/welding operator who makes a complete joint penetration groove weld pipe procedure qualification test, without backing strip, that meets the requirements is thereby qualified for that process. However, the following provisions shall apply:

A. Qualification on 6" diameter schedule 80 or 8" diameter schedule 120 pipe shall qualify for all thicknesses;

B. Qualification on 6" diameter schedule 80 or 8" diameter schedule 120 pipe shall qualify for 4" diameter and over;

C. Qualification on 4" diameter or less shall qualify for 3/4" diameter through 4" diameter;

D. Qualification on 2" diameter schedule 80 or 3" diameter schedule 40 shall qualify for all diameters through 4";

E. Qualification in the 6GR position shall qualify for groove and fillet welds in all positions of pipe, tubing and plate.

5.5.3 The type and number of test specimens required for mechanical testing shall be removed and tested in accordance with AWS D1.1.

5.5.4 A welder/welding operator, who fails his test, may be retested under the applicable provisions of 5.3.13.

5.5.5 When a welder/welding operator has not performed welding to the specific process for a minimum of 3 hours per 90 calendar days or there is specific reason to question his ability to make welds that meet the requirements, he shall be requalified under the applicable provisions of 5.3.12 and 5.3.14 respectively.

5.5.6 Renewal of qualification under the provisions of 5.3.12 need only be made in carbon steel (P-1) material 3/8" thickness.

5.5.7 Requalification, under the provisions of 5.3.13, shall meet the same requirements as the original qualification.

5.5.8 A welder/welding operator, as determined by the Welding Supervisor, may be required to requalify under the provisions of paragraph 5.3.19.

5.6 PQR and SQT acceptance criteria.

5.6.1 In addition to any requirements imposed by the applicable ASME Section III Construction Code, the following acceptance criteria shall apply for ASME Section IX Code WPS qualification:

A. Tension Test Acceptance Criteria.

1. The tension test specimen shall be ruptured under tensile load and the tensile strength shall be computed by dividing the maximum load by the least cross-sectional area of the specimen as measured before the load is applied.

a. TENSILE STREGNTH = $\dfrac{\text{MAXIMUM LOAD}}{\text{LEAST CROSS-SECTION AREA}}$

2. The tensile strength shall be not less than:

   a. The specified minimum tensile strength of the base metal; or

   b. If base metals of different minimum tensile strengths are used, the specified minimum tensile strength of the weaker of the two; or

   c. The specified minimum tensile strength of the weld when the applicable construction code provides for the use of weld metal having lower room temperature strength than the base metal; or

   d. If the specimen breaks in the base metal outside the weld or fusion line, the test shall be accepted as meeting the requirements, provided the strength is not more than 5% below the specified minimum tensile strength of the base metal.

B. Bend Tests Acceptance Criteria.

   1. The weld and heat-affected zone of a transverse weld bend specimen shall be completely within the bent portion of the specimen after testing; and

   2. The guided-bend specimens shall have no open defects exceeding 1/8", measured in any direction on the convex surface of the specimen after bending, except that cracks occurring on the corners of the specimens during testing shall not be considered, unless there is definite evidence that they result from slag inclusions or other internal defects.

   3. For corrosion resistant weld overlay cladding, no open defect exceeding 1/16" measured in any direction shall be permitted in the cladding, and no open defects exceeding 1/8" shall be permitted in the bond line.

C. Notch Toughness Tests Acceptance Criteria shall be in accordance with the applicable ASME Section III Code and the current ASME Section IX Code.

5.6.2 In addition to any requirements imposed by ASME Section IX and III Codes, and paragraph 5.3.6, either 5.6.2 (A) or 5.6.2 (B) acceptance criteria shall apply for SQT.

A. Bend Tests Acceptance Criteria.

1. The bend test acceptance criteria shall be the same as specified in paragraph 5.6.1-B.

B. Radiographic Examination Acceptance Criteria shall be accordance with T-NQCP-9.

C. The results of the welder/welding operator qualification tests shall be recorded on the SQT Record, Attachment IV.

5.6.3 The following acceptance criteria shall apply for AWS D1.1 SQT qualification:

A. The type and number of tests shall be removed and tested in accordance with AWS D1.1.

B. Bend Test Acceptance Criteria.

1. The weld and heat affected zone of the weld bend specimen shall be completely within the bent portion of the specimen after testing; and

2. The guided-bend specimens shall have no cracks or other open discontinuities exceeding 1/8" measured in any direction after bending. Cracks occurring on the corners of the specimen during testing shall not be considered.

5.7 Documentation of Welding Activities.

5.7.1 All maintenance welding or brazing activities to code or safety related items shall be initiated by a Maintenance Work Request. All welding or brazing activities will be controlled by the use of Weld Traveler or Brazing Traveler, Attachments VI and IX respectively, except as noted in 5.7.4 (A)(2). These applicable documents will provide the welder or brazer, the Quality Control Inspector, and, for Section XI repairs, the ANII with the necessary information to properly perform and control the welding and brazing activities.

5.7.2 The Weld Traveler or Brazing Traveler shall be either typed or filled out in black ink. All corrections to the applicable travelers shall be completed by drawing one line through the entry to be corrected, clearly entering the correction as near to its intended position as possible, and initialling and dating the correction.

5.7.3 The Weld Traveler or Brazing Traveler may be computer-produced based upon pre-programmed information. The Welding Supervisor and the Inspection Coordinator, or their designated alternates, shall review any computer produced travelers for adequacy, accuracy, and proper application and, also, affix signature and date.

5.7.4 Weld or Brazing Traveler, Attachments VI and IX, respectively, entries (1) through (25).

A. The Welding Supervisor, or his designated alternate, shall enter the information on the manually initiated Weld or Brazing Travelers in the following spaces prior to issue:

(1) SYSTEM OR COMPONENT - Enter the system or component designation and item name on which the welding or brazing is to be performed.

(2) WELD OR BRAZED JOINT NUMBER - Enter the number assigned to the weld or brazed joint. For repair welds or repair brazes, use the appropriate suffix: R1, R2, etc. For replacement welds, use the appropriate suffix: A, B, etc. For seal welds used as sealing devices, only one weld traveler is required for a group of such welds not to exceed 25 in number. Such welds shall be identified in remarks section of the weld traveler. Safety related tack welds used as locking devices need only be documented on the MWR with the following information.

A. WPS Number

B. Type and size welding electrodes used

C. Qualified welder's name and I.D. symbol.

(3) MAINTENANCE WORK REQUEST - Enter the MWR Number.

(4) CODE AND CLASS - Enter the applicable code and/or class, such as ASME Section III, Class 2.

(5) MATERIAL THICKNESS - Enter the wall thickness of the items being joined. If different thicknesses, enter both thicknesses.

(6) DIAMETER - If applicable, enter the outside diameter of the items being joined.

(7) PREHEAT AND INTERPASS TEMPERATURE - Enter the minimum and maximum temperatures, as applicable. These temperatures are obtained from the WPS(s) or BPS(s).

(8) POST WELD HEAT TREATMENT OR POST BRAZE HEAT TREATMENT - Circle "YES" or "NO" as applicable.

(9) WELDING PROCEDURE OR BRAZING PROCEDURE - Enter the applicable WPS(s) or BPS(s) number(s) and designation(s) which are to be used to join the items.

(10) FILLER MATERIAL - Enter the applicable filler materials to be used with the listed WPS(s) or BPS(s).

(11) NDE REQUIRED - Enter the type(s) of NDE required for the weld or brazed joint.

NOTE: Enter base material specification(s) and/or number, material identification number(s), as applicable in space 20.

(12) PREPARER'S SIGNATURE AND DATE - The individual preparing the traveler shall affix signature and date.

B. Space is provided for the Quality Control Inspector and, for ASME Section XI hold or witness points, the ANII to verify the following operations by affixing signature and date as the welding or brazing activity progresses.

(13) PROCESS CHECK POINT SEQUENCE

(A) JOINT CLEANLINESS - Verification of joint cleanliness prior to fitup.

(B) POSSIBLE LIMITED ACCESS - Circle "YES" or "NO", as applicable. If "YES", verifies that welder or brazer is qualified for "Limited Access" prior to proceeding to next operation.

(C) EXCAVATION (NDE. VT, PT, MT, RT) - To be completed at the time of the inspection activity to verify that repaired areas have been properly excavated and for the performance of any required excavation NDE.

(D) CHECK FITUP - Verifies that the joint is properly fitup in accordance with the applicable WPS(s) or BPS(s) and this procedure. Verifies the filler material is the proper type and size. Verifies that the shielding gas and flow rate are in accordance with the requirements.

(E) PURGE - Verifies that the gas backpurge, when required, is in accordance with the requirements.

(F) CHECK PREHEAT PRIOR TO ROOT PASS - Verifies that the preheat is in accordance with the specified requirements.

(G) CHECK BACKGOUGING/GRINDING - Verifies that complete joint penetration double groove welds are backgouged or ground back to sound metal on the opposite side prior to deposition of weld metal on the back side.

(H) CHECK INTERPASS TEMPERATURE - Verifies that the interpass temperature is in accordance with specified requirements. It shall be verified at least once per day. If temperature is verified more than 3 times, additional verifications shall be entered in the "Remarks" section.

(13) PROCESS CHECK POINT SEQUENCE (Continued)

(I) VISUALLY INSPECT COMPLETED WELD OR BRAZED JOINT - Verifies that the completed weld or brazed joint meets the applicable visual acceptance requirements.

(J) CHECK DELTA FERRITE/RECORD IN "REMARKS" - Measures and records the Delta Ferrite Content of all stainless steel welds having a thickness greater than 1". Measurements shall be taken using a calibrated Severn Gage or equivalent and shall have a minimum reading of 3% Delta-Ferrite. The measurements shall be taken at 4 locations and, when appropriate, 90° apart around the circumference of the weld.

C. The following columns are used by the Quality Control Inspector and the ANII to verify the "In Process" welding or brazing inspection activities, as applicable:

(14) Quality Control Inspector's column for affixing signature and date for those welding or brazing inspection activities performed, as applicable.

(15) ANII's column for selecting inspection hold or witness points, and affixing signature and date for those welding or brazing inspection activities performed, as applicable.

D. Each welder or brazer performing the activity shall enter the applicable information in the following appropriate columns during the welding or brazing activity, respectively:

(16) FILLER MATERIAL - Enter the size, type, and heat/lot number of the filler material, e.g., 1/8", ER308L B802.

(17) WELDER'S OR BRAZER'S NAME AND I.D. NUMBER - Each welder or brazer who performs the welding or brazing, respectively, shall enter his name and I.D. Number.

E. Space is provided for the Quality Control Inspector to verify the applicable information by affixing signature and date in the following appropriate columns:

(18) Enter the WPS(s) or BPS(s) and its applicable revision used to make the weld or brazed joint, respectively.

(19) Enter NDE results (accepted or rejected) and report number. Affix signature and date.

(20) Base material specification(s), heat number, and/or material identification numbers, as applicable. Affix signature and date.

(22) Affix signature and date after any required Post Weld Heat Treatment or Post Braze Heat Treatment, as applicable, has been completed and accepted.

(23) Affix signature and date after all welding activities have been completed and accepted.

F. The Welding Supervisor or Assistant Manager-Maintenance Services shall affix signature and date in appropriate columns (24) and (25), respectively, after hydrostatic testing or a system leakage test, when required, has been completed in order for the applicable weld or brazed joints to be released to operations.

G. Any individual involved with the welding or brazing activity may use the "Remarks" section, column (21), to record any information which may be worthwhile or meaningful in the production, inspection, or final review of the weld or brazed joint, respectively. When an additional traveler is initiated, the "Remarks" section, column (21), shall be used to indicate the reason for an additional traveler and, also, to reference the applicable additional travelers.

H. All entries made on the travelers shall be legible.

5.7.5 Prior to release for welding or brazing activities, the Director of Station Quality Control or his Designee and, when required, the Authorized Nuclear Inservice Inspector shall review the Weld or Brazing Traveler along with the MWR for the establishment of any inspection hold or witness points.

5.7.6 Upon completion of the welding or brazing activities, the Director of Station Quality Control or Designee and the Welding Supervisor shall review the Weld or Brazing Traveler, respectively, in order to ensure all activities have been properly performed and the Documentation is correct.

5.8 Materials.

5.8.1 All replacement base materials shall conform to the requirements of the applicable construction code or other appropriate codes or standards.

5.8.2 All modification or alteration base materials shall conform to the requirements of the modification or alteration specification(s).

5.8.3 Welding material shall conform to the requirements of the applicable construction code or specification and the applicable WPS(s) or BPS(s). All welding materials shall be issued and controlled in accordance with Welding Material Procedure WM-2.0.

5.9 Welding Activities.

NOTE: Reactor Coolant System piping shall be purged with nitrogen or argon before and during thermal cutting or grinding activities which would result in opening the Reactor Coolant System to atmosphere.

5.9.1 Base Metal Preparation.

A. The joint edges shall be prepared by machining, grinding, shearing, oxygen-fuel cutting or carbon air arc gouging and shall be in accordance with the dimensions specified in the WPS and/or this procedure. Materials prepared by oxygen-fuel cutting or carbon air arc gouging shall be pre-heated in accordance with the requirements of this procedure. Oxygen-fuel cutting or carbon air arc gouging shall be followed by grinding to the required angle or joint specification. The welding groove shall be reasonably smooth, uniform, and free from fins, tears, cracks and other discontinuities which would adversely affect the quality or strength of the weld. The use of cutting oils is not permitted on stainless steels.

B. When oxygen-fuel cutting or carbon air arc gouging is used for rough cutting, all remaining slag, scale, or oxides shall be removed by machining or grinding the cut end to sound metal with a minimum of 1/16" removal.

C. Prior to welding ASME Section III materials, ANSI B31.1 materials and AWS materials, all surfaces 1 to 2 inches on each side of the prospective weld shall be free from foundry skin, scale, moisture, rust, sand, slag, paint, marking crayon or ink, alkaline cleaner residue, low melting alloy residue, oxides, dirt or other deleterious material providing the size and shape of the material will accommodate this dimension. These deleterious materials may be removed by machining, wire brushing, or grinding. Shot blasting is not permitted. All oil and grease 6 inches on each side of the weld joint shall be removed by cleaning with Magnaflux Cleaner-Remover SKC-S or other approved solvent.

All stainless steel or inconel welds shall have surfaces 2 inches on each side of the welds specially cleaned using Magnaflux Cleaner-remover SKC-S or other approved solvent. Primary Coolant or NSSS components shall be cleaned only with technical grade acetone or isopropyl alcohol. For AWS welds, mill scale that withstands vigorous wire brushing, a thin rust inhibitive coating or anti-spatter coating may remain, except that for girders all mill scale shall be removed from the surfaces on which the flange-to-web welds are to be made by the shielded metal arc welding process.

D. All cleaning and grinding tools to be used on stainless steel and inconel shall be color-coded International Orange or Federal Orange for use on stainless steel and inconel only. The color-coding shall be marked on a part of the tool that will not come in contact with the work piece. Grinding shall be performed with rubber or resin bonded aluminum or silicon carbide grinding wheels. Tools previously used on carbon or low alloy steels shall not be used on stainless steels or inconel. Wachs cutters or equivalent which have been used on carbon or low alloy steels may be used on stainless steels or inconel provided no cutting oil is used. Bimetallic welds (carbon to stainless steel) do not require the use of tools color-coded for stainless steel only.

E. If welding has not started within 6 hours after base metal preparation and cleaning, the weld joint shall be suitably wrapped to prevent deleterious material contamination. Upon removal of the protective wrap and prior to welding, the weld joint shall be inspected by a certified Quality Control Inspector.

5.9.2 Fitup of Butt Joints.

A. Fitup shall be accomplished by the use of clamps, alignment lugs, tack welds or other appropriate means to properly align the joint for welding. Whenever possible, mechanical means for alignment should be used. If alignment lugs are used, the lug material will be compatible with the base material. The lugs shall be of the same general chemical composition as the base materials. Bi-metallic welds (stainless to carbon steel) shall have lugs made from stainless steel. The carbon steel side must be welded in accordance with a bi-metallic WPS.

B. If welded lugs are used, they must be removed after serving their purpose and the areas ground flush with the base material and the area inspected for minimum wall violation, cracks and other deleterious defects. The type and method of NDE shall be in accordance with the applicable code.

C. If required to meet fitup tolerance, material surfaces may be built up by buttering with weld metal by welders qualified to a WPS(s) for groove welds which is applicable to the part being buttered.

D. For ASME Section III piping, fitup and align pipe sections and components so the maximum offset of the finished weld is less than that listed below, where t is the nominal thickness of the thinner of the two pieces being joined:

SECTION THICKNESS	DIRECTION OF JOINTS	
	LONGITUDINAL	CIRCUMFERENTIAL
Up to 1/2" inclusive	1/8"	1/4 t
Over 3/4" to 1 1/2" inclusive	1/8"	3/16"
Over 1 1/2" to 2" inclusive	1/8"	1/8 t
Over 2"	lesser of 1/16 t or 3/8"	3/4"

Offsets within the tolerances above shall be faired to at least a 3 to 1 taper over the width of the finished weld, or by adding additional weld metal beyond what would otherwise be the edge of the weld.

E. When component inside surfaces are inaccessible for welding or fairing, inside diameter misalignment shall not exceed 1/16" maximum on ANSI B31.1 welds and 1/32" concentric mismatch or 3/32" maximum at any one point for centerline offset on ASME Section III welds.

5.9.3 Fitup of socket joints.

A. The following steps shall be followed to obtain the proper socket gap dimension and alignment:

1. The pipe or tube shall be cut by mechanical means so the tube or pipe end is square with the longitudinal axis of the tube or pipe.

2. Scribe a line with a scribe or center punch with a blunt nose punch on the socket fitting O.D. approximately 1/4" from the face of the socket fitting.

3. Fully insert tube or pipe into the socket fitting.

4. Holding tube or pipe in concentric alignment with the socket fitting, scribe a line on the tube or pipe O.D. 1" away from the first scribe line.

5. Withdraw the tube or pipe 1/16" to 1/8" to obtain a distance between the two scribe lines of 1 1/16" to 1 1/8" for socket fittings equal to or greater than 3/4" nominal pipe size.

6. Withdraw the tube or pipe 1/16" to 3/32" to obtain a distance between the two scribe lines of 1 1/16" to 1 3/32" for socket fittings less than 3/4" nominal pipe size.

7. Following other applicable variables of the WPS(s) and keeping the tube or pipe in concentric alignment with the socket fitting, tack weld in this position.

8. After tack welding, the distance between the two scribe lines shall be 1 1/16" to 1 3/32" as described in 5.9.3.A (5) or 5.9.3.A (6) as applicable.

9. Refer to figure 5.9.3-A(a) for a single view pictorial graphic of fitup dimensions.

5.9.4 Backing Rings

A. Backing rings, strips or bars, if required by the applicable WPS(s), shall be made of material which is compatible with the base material.

B. Backing rings shall not be used for welds joining ASME Class 1 components. Backing rings shall not be used for welds joining ASME Class 2 or 3 components, unless specified in the design specification.

C. If split type backing is used, the backing shall be welded to form a continuous length of backing after fitting but prior to welding of the joint.

D. The gap between the backing and the base metal in ASME Section III weldments shall not exceed:

(NOT TO SCALE)

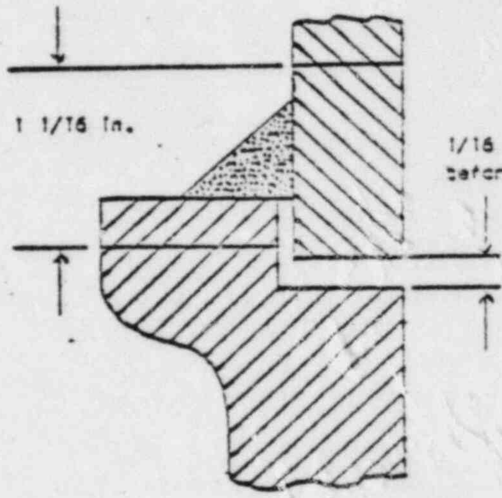


FIGURE 5.9.3-A(a) DIMENSIONS FOR FITUP OF SOCKET JOINTS

WALL THICKNESS, IN.	CLEARANCE, INCHES
1/4 to 1/2	.010
Over 1/2 to 1	.020
Over 1 to 2	.030
Over 2	.040

E. The gap between the backing and the base metal in ANSI B31.1 weldments shall not exceed 1/32".

F. The gap between the backing and the base metal in AWS D1.1 weldments shall not exceed 1/16".

G. Spacer pins, if used, shall not be incorporated into the weld.

5.9.5 Consumable Inserts.

A. Consumable inserts, when required, shall be of the type and/or dimensions specified on the WPS.

5.9.6 Shielding and Purging Gas.

A. The shielding gas and flow rate during welding shall be as specified on the WPS.

B. Purging is required on stainless steel and inconel socket welds when the pipe or tube wall thickness is less than 1/8".

C. Prior to welding, the weld joint shall be purged, if required, at a flow rate of approximately 25 cubic feet per hour (CFH) until a minimum of 6 volume changes have occurred or until the oxygen content has been analyzed to be below 1.0%.

D. During welding, the purge flow rate may be reduced to a minimum of 10 cubic feet per hour, but not less than that specified on the applicable WPS(s), and shall continue until the weld is 3/16" thick or two weld layers have been deposited, whichever is greater.

E. Since water soluble purge dams may become insoluble at elevated temperatures, precautions shall be taken to ensure the dams are installed at least 12" on both sides of the weld joint. The outside of the piping system or other items shall be marked with an appropriate marker showing the internal locations of these dams.

The temperature shall be checked periodically by use of appropriate temperature indicating crayons, calibrated thermocouple pyrometers or other suitable means on the outside surface of the pipe or other item at the dam installation location. In the event the temperature approaches or exceeds 275°F, the welding operation shall cease until the temperature has dropped to 150°F.

Should subsequent Post Weld Heat Treatment be required, the purge dams shall be located at a minimum distance of 36" on each side of the heating band. Temperature verification shall be performed as described above.

5.9.7 Preheat and Interpass Temperature.

A. ASME Section III Components, Class 1, 2 and 3.

1. For carbon steel (P-1) circumferential butt joints, including branch connections or socket welds, in material with a maximum reported carbon content greater than 0.3% or a nominal wall thickness greater than 3/4", the minimum preheat and interpass temperature shall be 200°F. The minimum preheat shall not be interrupted until at least 30% of the weld joint is complete. After interruption, when permitted, the minimum preheat temperature must be re-established prior to resuming welding.

2. For carbon steel (P-1) fillet welds attaching pressure parts to non-pressure parts where the nominal wall thickness of the pressure part is less than 3/4", the minimum preheat and interpass temperature shall be 200°F. The minimum preheat shall not be interrupted until at least 30% of the weld joint is completed. After interruption, when permitted, the minimum preheat temperature must be re-established prior to resuming welding.

3. For other carbon steel welds not specified herein, the minimum preheat and interpass temperature shall be 60°F.

4. For stainless steel (P-8) and inconel (P-43) welds, the preheat and interpass temperature range shall be 60°F to 350°F.

5. For bi-metallic welds (carbon steel to stainless steel), the preheat and interpass temperature shall have a minimum temperature of that required for the carbon steel, as stated in 1. and 2. above, and a maximum temperature of 350°F.

6. For Main Steam, Feedwater and Reactor Building penetration welds over 5/8" wall thickness, the maximum interpass temperature shall be 350°F.

7. For low alloy steel (P-3) to carbon steel (P-1) welds, the preheat and interpass temperature range shall be 200°F to 350°F.

B. ASME Section III, Class MC.

1. For carbon steel (P-1) welds in material with a nominal wall thickness over 1" and having a minimum specified tensile strength of 70,000 PSI or higher, the minimum preheat and interpass temperature shall be 200°F. For other lower strength materials, the 200°F preheat and interpass temperature requirement shall be applied to material with a nominal wall thickness of over 1 1/4".

2. For all other carbon steel welds, the minimum preheat and interpass temperature shall be 60°F.

3. For stainless steel (P-8) and inconel (P-43) welds, the preheat and interpass temperature range shall be 60°F to 350°F.

4. For bi-metallic welds, the preheat and interpass temperature range shall have a minimum temperature of that required for the carbon steel, as stated in 1. and 2. above, and a maximum temperature of 350°F.

C. ASME Section III, Component Supports.

1. For groove welds in carbon steel (P-1) material with a nominal thickness greater than 1", the minimum preheat and interpass temperature shall be 200°F.

   For groove welds in material with both a specified maximum carbon content in excess of .30% and a thickness of 1", the minimum preheat shall not be interrupted until at least 30% of the joint is completed. This non-interruption requirement does not apply to fillet welds 3/4" and under in size which are used to attach insulation clips and other parts not carrying loading due to internal pressure. After interruption, when permitted, the minimum preheat temperature must be re-established prior to resuming welding.

2. For carbon steel fillet welds with a size of 3/4" or less the minimum preheat and interpass temperature shall be 200°F.

3. For other carbon steel (P-1) welds, the minimum preheat and interpass temperature shall be 60°F.

4. For stainless steel welds, the preheat and interpass temperature range shall be 60°F to 350°F.

5. For bi-metallic welds, the preheat and interpass temperature range shall have a minimum temperature of that required for the carbon steel, as stated in 1. and 2. above, and a maximum temperature of 350°F.

D. ASME Section III Items Not Listed in A, B and C.

1. For other ASME Section III items not described in A, B and C, figures 5.9.7-D(a), 5.9.7-D(b), 5.9.7-D(c) and 5.9.7-D(d) shall be used to determine the preheating temperature requirements.

2. Notes applicable to figures 5.9.7-D(a) through (d) are as follows:

   a. The nominal thickness is defined as the thickness of the weld, base material, pressure retaining material or the thinner of the sections being joined, whichever is least. For fillet welds, the nominal thickness is the throat thickness and, for partial penetration and material repair welds, the nominal thickness is the depth of the weld groove or preparation.

   b. Preheat and interpass temperatures may be verified by the use of approved temperature indicating crayons, calibrated thermocouple pyrometers, or other suitable methods.

E. ANSI B31.1 Piping and Supports.

1. For carbon steel (P-1) welds in material with both a specified carbon content greater than .30% and a thickness at the joint greater than 1", the minimum preheat and interpass temperature shall be 200°F.

2. For all other carbon steel (P-1) welds, the minimum preheat and interpass temperature shall be 60°F.

3. For stainless steel (P-8) welds, the preheat and interpass temperature range shall be 60°F to 350°F.

4. For bi-metallic welds (carbon steel to stainless steel), the preheat and interpass temperature shall have a minimum temperature of that required for the carbon steel, as stated in 1. and 2. above, and a maximum temperature of 350°F.

P-No. QW-420, Sect. IX		Type of Weld	(2.a) Nominal Thickness	Properties of Pressure Retaining Material Being Joined: Max. Reported Carbon, %	Properties of Pressure Retaining Material Being Joined: (2.b.) Min. Preheat Req'd, °F
1	Vessels	Circumferential butt and socket welds connecting pipe and tubes to nozzles	1 1/4" and less	0.30 or less	...
			over 1 1/4" to 1 1/2"	0.30 or less	200
			3/4" or less	over 0.30	...
			over 3/4" to 1 1/2"	over 0.30	200
		Fillet welds	3/4" or less	...	200
		All welds, except repair welds, provided the welding procedure qualification is made in equal or greater thickness than the production weld	5/8" or less	0.25 or less	200
	Other components	All welds, including repair welds, in material 1 1/2" (38 mm) and less	1 1/4" and less	0.30 or less	...
			over 1 1/4" to 1 1/2"	0.30 or less	200
			3/4" or less	over 0.30	...
			over 3/4" to 1 1/2"	over 0.30	200
		Fillet, partial penetration and repair welds in material over 1 1/2"	3/4" or less	...	200
3 except Gr. 3		All welds, except repair welds in vessels, provided weld procedure qualification is made in equal or greater thickness than production weld	5/8" or less	0.25 or less	200
		Attachment welds joining non-pressure-retaining material to pressure retaining material	1/2" or less	0.25 or less	200
		Circumferential butt welds or socket welds in pipe and tubes	1/2" or less	0.25 or less	200
4		Circumferential butt welds in tubes with nominal O.D. 4" or less and attachment welds	1/2" or less	0.15 or less	200
5		Circumferential butt welds in pipe and tubes with maximum reported chromium 3.00% or less and attachment welds	1/2" or less	0.15 or less	300
7		Type 405 and 510 welded with A-No.7, A-No.8, or F-No.43 filler metal	3/8" or less	0.08 or less	...
1, 3		For vessel repair without required PWHT, see NB 4600 and NC 4600 as applicable	...	...	350

FIGURE 5.9.7-IX(a) CLASS 1 AND CLASS 2 COMPONENTS

P-No. QW-420, Sect. IX	Type of Weld	(2.a.) Nominal Thickness	Properties of Material(s) Being Joined	
			Max. Reported Carbon, %	(2.b.) Min. Preheat Req'd, °F
1	All welds, including repair welds, in material 1 1/2" and less	1 1/4" and less	0.30 or less	...
		over 1 1/4" to 1 1/2"	0.30 or less	200
		3/4" or less	over 0.30	...
		over 3/4" to 1 1/2"	over 0.30	200
	Fillet, partial penetration and repair welds in material over 1 1/2"	3/4" or less	...	200
3 except Gr. 3	All welds	1/2" or less	0.25 or less	200
4	All welds in pipes or tubes with nominal O.D. 4" or less	1/2" or less	0.15 or less	250
5	All welds in pipes or tubes with maximum specified chromium 3.00% or less and nominal O.D. 4" or less	1/2" or less	0.15 or less	300
7	Type 405 and 410 welded with A-No. 7, A-No.8, or F-No. 43 filler metal	3/8" or less	0.08 or less	...

FIGURE 5.9.7-D(d) COMPONENT SUPPORTS

P-No. QW-420, Sect. IX	Type of Weld	(2.a.) Nominal Thickness	Properties of Pressure Retaining Material Being Joined: Max. Reported Carbon, %	(2.b.) Min. Preheat Req'd, °F
1	All welds, except welds attaching nozzles or penetrations to the vessel shell, in material 1 1/2" and less	1 1/4" or less	0.30 or less	...
		over 1 1/4" to 1 1/2"	0.30 or less	200
		3/4" or less	over 0.30	...
		over 3/4" to 1 1/2"	over 0.30	200
	Fillet, partial penetration and repair welds in material over 1 1/2", except welds attaching nozzles or penetrations to the vessel shell	3/4" or less	...	200
	All welds attaching nozzles with nominal I.D. 2" and less	3/4" or less	...	200

FIGURE 5.9.7-D(c) CLASS MC COMPONENTS

P-No. QW-420, Sect. IX	Type of Weld	(2.a.) Nominal Thickness	Properties of Material(s) Being Joined	
			Max. Reported Carbon, %	(2.b.) Min. Preheat Req'd, °F
1	All welds, including repair welds, in material 1 1/2" and less	1 1/4" and less	0.30 or less	...
		over 1 1/4" to 1 1/2"	0.30 or less	200
		3/4" or less	over 0.30	...
		over 3/4" to 1 1/2"	over 0.30	200
	Fillet, partial penetration and repair welds in material over 1 1/2"	3/4" or less	...	200
3 except Gr. 3	All welds	1/2" or less	0.25 or less	200
4	All welds in pipes or tubes with nominal O.D. 4" or less	1/2" or less	0.15 or less	250
5	All welds in pipes or tubes with maximum specified chromium 3.00% or less and nominal O.D. 4" or less	1/2" or less	0.15 or less	300
7	Type 405 and 410 welded with A-No. 7, A-No.8, or F-No. 43 filler metal	3/8" or less	0.08 or less	...

FIGURE 5.9.7-D(d) COMPONENT SUPPORTS

5. For carbon steel (P-1) to chromium-molybdenum alloy steel (P-4 and P-5) welds, the minimum preheat and interpass temperature shall be 400°F. The preheat shall not be interrupted until at least 3/8" thickness of weld is deposited or 25% of the joint is completed, whichever is greater. After interruption, when permitted, the minimum preheat temperature shall be re-established prior to resuming welding.

F. ANSI B31.1 Items Not Listed in E.

1. For other ANSI B31.1 items not described in E., figure 5.9.7-F(a) shall be used to determine the preheating temperature requirements.

FIGURE 5.9.7-F(a) ANSI B31.1 ITEMS

ASME Sec. IX P-Nos.	Preheat Required	
	Minimum Wall, Inches 2.(a), 2.(b)	Min. Temperature, °F 2 (c), 2.(d)
P-1	All	50 for ≤ .30% carbon
P-1	All	175 for > 1" thickness and > .30% carbon
P-3	All walls	175
P-4	Up to 3/4" Over 3/4"	300 400
P-5 < 5% CR.	Up to 3/4" Over 3/4"	300 400
P-5 ≥ 5% CR.	Up to 3/4" Over 3/4"	300 400
P-6	All walls	300 ≤ 600°F interpass
P-8	All walls	None required

2. Notes applicable to figure 5.9.7-F(a) are as follows:

   a. Wall thickness of a butt weld is defined as the thicker of the two abutting ends after end preparation including I.D. machining.

   b. The thickness of socket, fillet, and seal welds is defined as the throat thickness for pressure and non-pressure retaining weld.

   c. Preheat and interpass temperatures may be verified by the use of approved temperature indication crayons, calibrated thermocouple pyrometers, or other suitable methods.

   d. For inert gas tungsten arc root pass welding, lower preheat in accordance with the applicable WPS(s) may be used.

G. AWS D1.1 Welds.

1. For welds in carbon steel material with a thickness of 1 1/2" or less, the interpass temperature shall be at least 70°F, unless otherwise specified on the WPS.

2. For welds in carbon steel material with a thickness of over 1 1/2" through 2 1/2", the minimum preheat and interpass temperature shall be at least 150°F, unless otherwise specified on the WPS.

3. For welds in carbon steel material with a thickness over 2 1/2", the minimum preheat and interpass temperature shall be 225°F, unless otherwise specified on the WPS.

4. For welds in stainless steel material, the preheat and interpass temperature range shall be 60°F to 350°F.

5. For bi-metallic welds (carbon steel to stainless steel), the preheat and interpass temperature range shall have a minimum temperature of that required for carbon steel, as stated in 1, 2 and 3 above, and a maximum interpass temperature of 350°F.

6. Preheat and interpass temperatures shall be sufficient to prevent crack formation. Where highly restrained welds are encountered, detailed work instructions shall specify the preheat and interpass temperature requirements.

H. AWS D1.1 Items Not Listed in G.

1. For other AWS D1.1 items not described in G., figures 5.9.7-H(a) and 5.9.7-H(b) shall be used to determine the preheating and interpass temperature requirements.

2. Notes applicable to figures 5.9.7-H(a) and (b) are as follows:

   a. When the base metal temperature is below 32°F, the base metal shall be preheated to at least 70°F and this minimum temperature maintained during welding.

   b. For quenched and tempered steel, the maximum preheat and interpass temperature shall not exceed 400°F for thicknesses up to 1 1/2", inclusive, and 450°F for greater thicknesses. Heat input when welding quenched and tempered steel shall not exceed the steel producer's recommendation.

   c. In joints involving combinations of base metals, preheat shall be as specified for the higher strength steel being welded.

   d. Preheat and interpass temperatures may be verified by the use of approved temperature indicating crayons, thermocouple pyrometers, or other suitable methods.

MINIMUM PREHEAT AND INTERPASS TEMPERATURE (2.b., 2.c.)

Steel Specification		Welding Process	Thickness of Thickest Part At Point of Welding, In.	Minimum Temperature, °F
ASTM A36 ASTM A53 ASTM A106 ASTM A131 ASTM A139 ASTM A381 ASTM A500 ASTM A501 ASTM A516 ASTM A524 ASTM A529 ASTM A570 ASTM A573 ASTM A709 API 5L API 5LX ABS	 Grade B Grade B Grades A, B, C, CS, D, E Grade B Grade Y35 Grade A Grade B Grades 55 and 60 Grades I and II Grades D and E Grade 65 Grade 36 Grade B Grade 42 Grades A, B, C, CS, DS Grade E	Shielded metal arc welding with other than low hydrogen electrodes	up to 3/4 over 3/4 through 1 1/2 over 1 1/2 through 2 1/2 over 2 1/2	(2.a.) none 150 225 300
ASTM A36 ASTM A53 ASTM A106 ASTM A131 ASTM A139 ASTM A242 ASTM A381 ASTM A441 ASTM A500 ASTM A501 ASTM A516 ASTM A524 ASTM A529 ASTM A537 ASTM A570 ASTM A572 ASTM A573 ASTM A588 ASTM A595	 Grade B Grade B Grades A, B, C, CS, D, E AH 32 and 36 DH 32 and 36 EH 32 and 36 Grade B Grade Y35 Grade A Grade B Grades 55 and 60 65 and 70 Grades I and II Classes 1 and 2 Grades D and E Grades 42, 45, 50 Grade 65 Grades A, B, C	Shielded metal arc welding with low hydrogen electrodes	up to 3/4 over 3/4 through 1 1/2 over 1 1/2 through 2 1/2 over 2 1/2	none 50 150 225

FIGURE 5.9.7-H(a) AWS D1.1

MINIMUM PRE-HEAT AND INTERPASS TEMPERATURE (2.b., 2.c.)

Steel Specification	Welding Process	Thickness of Thickest Part At Point of Welding, In.	Minimum Temperature, °F
ASTM A606 ASTM A607 Grades 45, 50, 55 ASTM A618 ASTM A633 Grades A, B Grades C, D ASTM A709 Grades 36, 50, 50W API 5L Grade B API 5LX Grade 42 API Spec. 2H ABS Grades AH 32 and 36 DH 32 and 36 EH 32 and 36 ABS Grades A, B, D, CS, DS Grade E	Shielded metal arc welding with low hydrogen electrodes	up to 3/4	(2.a.) none
		over 3/4 through 1 1/2	50
		over 1 1/2 through 2 1/2	150
		over 2 1/2	225
ASTM A572 Grades 55, 60, 65 ASTM A633 Grade E	Shielded metal arc welding with low hydrogen electrodes	up to 3/4	50
		over 3/4 through 1 1/2	150
		over 1 1/2 through 2 1/2	225
		over 2 1/2	300
ASTM A514 ASTM A517 ASTM A709 Grades 100 and 100W	Shielded metal arc welding with low hydrogen electrodes	up to 3/4	50
		over 3/4 through 1 1/2	125
		over 1 1/2 through 2 1/2	175
		over 2 1/2	225

FIGURE 5.9.7-H(b) AWS D1.1

I. The specified preheat shall be attained prior to any welding, including tack welding, or thermal cutting activities.

J. When preheat is required for any weld joints, the preheat band shall extend from the point of welding to at least 3" in any direction providing the size of the work piece will accommodate this 3" dimension.

K. The preheat temperature shall be verified approximately 1 to 2 inches away from the weld.

5.9.8. Tack Welds.

A. Tack welds shall be made by welders qualified to use the applicable WPS.

B. Tack welds shall be kept to a minimum size and number. When tack welds made in the open butt single vee pipe joints are not removed but are to be incorporated into the weld, they shall be ground so that they do not exceed 1/8" thickness and their ends shall be feathered to facilitate incorporation into the final weld.

C. Open butt pipe tack welds and root passes shall be performed by the GTAW process only, unless the reverse side of the weld is accessible for cleanup, repair and examination, in order to accomplish a sound, uniform and full penetration weld.

D. Preheat and interpass temperature shall be the same for tack welds as required for the weld unless otherwise specified on the WPS(s).

E. Cracked or otherwise defective tack welds shall be removed in their entirety prior to proceeding with the welding operation.

F. The work piece shall be protected from deleterious contamination and from rain, snow, and wind during tack welding. Tack welding shall not be performed on wet surfaces.

5.9.9 Welding Operations.

A. The applicable WPS(s), as shown on the Weld Traveler, shall be used to perform the welding operation following the welding parameters and variables, tabulated or described in the WPS(s), such as current, voltage, electrode type and size, shielding gas, purge gas, etc.

B. The number of passes or layers as shown on the WPS(s) are typical and may vary with material thickness and welding electrode diameter.

C. Weld progression shall be as shown on the applicable WPS(s).

D. When welding pipe circumferential weld joints, each layer of weld metal shall be completed around the entire circumference of the weld groove prior to depositing succeeding weld passes.

E. Weaving width shall not exceed three (3) times the welding electrode size or for inert Gas Tungsten Arc Welding the gas cup orifice inside diameter.

F. Peening of welds is not permitted unless specific authorization is obtained from the welding supervisor.

G. Weld bead thickness shall not exceed 1/8" unless otherwise specified on the WPS(s) or on the weld traveler.

H. A minimum of two layers is required for all pipe joints.

I. When item to be welded is filled with water, welding is not permitted unless specific authorization is granted by the Welding Supervisor.

J. Complete joint penetration double groove welds shall be ground or carbon air arc gouged back to sound metal on the opposite side. The opposite side weld root area shall be cleaned to sound metal and contoured to permit proper deposition of the root pass from the second side.

K. The work piece shall be protected from deleterious contamination and from rain, snow, and wind during welding. Welding shall not be performed on wet surfaces. Welding shall not be performed within 18" of caulked lead joints or any other lead containing materials unless specific authorization is granted by the Welding Supervisor.

L. Typical weld joint groove designs are shown on the applicable WPS(s). However, these groove designs may vary with the application and material specification.

M. The technique of depositing weld metal shall be such that undercutting of a groove face shall be minimum. Undercutting of a groove face in excess of 1/32" shall be blended in by grinding before depositing the next layer of weld metal.

Sharp changes in sections at the toe of any weld, except undercut, shall be eliminated by grinding, taking care to avoid thinning of the base metal. Any cracks, blowholes or other defects of any nature detected during welding shall be removed by grinding or chipping before the next successive bead or layer of weld metal is deposited.

5.9.10 Interpass Cleaning.

A. All beads or layers of weld metal shall be cleaned prior to depositing the next successive bead. Cleaning shall be accomplished by wire brushing, filing, chipping or grinding to sound metal. Precautions shall be taken not to unduly harm the base metal outside and inside the welding groove during cleaning operations.

B. Craters of starting and stopping ends of each layer deposited and on groove faces shall be removed by grinding before depositing the next successive pass of weld metal.

C. Cleaning tools and equipment shall be as specified in 5.9.1 of this procedure.

D. Interpass cleaning shall be accomplished using the most effective and efficient methods compatible with material specification and welding process.

5.9.11 Finished Weld Surfaces.

A. As-welded surfaces are permitted. However, the surface of welds shall be sufficiently free from coarse ripples, grooves, overlaps, abrupt ridges and valleys, arc strikes, weld splatter and slag to meet the following requirements:

1. Where non-destructive examination, including visual, of welds is required by codes and/or design specifications, the surface condition of the finished weld shall be suitable for proper interpretation of the results of the appropriate NDE examination(s).

2. The applicable dimensions of butt weld reinforcement are listed herein as follows:

a. ASME SECTION III VESSELS, PUMPS AND VALVES

Material Nominal Thickness, Inches	Max. Reinforcement, Inches
Up to 1, inclusive	3/32
Over 1 to 2, inclusive	1/8
Over 2 to 3, inclusive	5/32
Over 3 to 4, inclusive	7/32
Over 4 to 5, inclusive	1/4
Over 5	5/16

b. ASME SECTION III PIPING WELDS

Material Nominal Thickness, Inches	Max. Reinforcement, Inches	
	Outside Surface	Inside Surface
Up to 1/8, inclusive	3/32	3/32
Over 1/8 to 3/16, inclusive	1/8	3/32
Over 3/16 to 1/2, inclusive	5/32	1/8
Over 1/2 to 1, inclusive	3/16	5/32
Over 1 to 2, inclusive	1/4	5/32
Over 2	1/4 or 1/8 times the width of the weld, whichever is greater.	5/32

c. ASME SECTION III COMPONENT SUPPORT WELDS

Material Nominal Thickness, Inches	Max. Reinforcement, Inches
Up to 1, inclusive	3/32
Over 1 to 2, inclusive	1/8
Over 2 to 3, inclusive	5/32

d ASME B31.1 WELDS

Material Nominal Thickness, Inches	Max. Reinforcement, Inches
Up to 1/2, inclusive	1/16
Over 1/2 to 1, inclusive	3/32
Over 1 to 2, inclusive	1/8
Over 2	5/32

e. AWS D1.1 - Maximum reinforcement shall be 1/8".

3. Weld surfaces shall not be "washpassed" by use of the GTAW Process.

4. The maximum allowable undercut at the toe of the weld shall not exceed 1/32" nor shall it encroach on the minimum wall thickness of the item. Grinding to remove undercut is not permitted. Undercut exceeding the maximum allowable shall be corrected by depositing a cover pass of weld metal using the applicable WPS(s).

5. Concavity on the root side of a single welded circumferential butt weld is permitted when the resulting thickness of the weld is at least equal to the thickness of the thinner member of the two sections being joined.

6. When items of different diameters are welded together, there shall be a gradual transition between the two surfaces of not less than a 3:1 taper unless greater slopes are permitted by analysis. The length of transition may include the weld.

7. Specially machined welded end transitions shall meet the requirements of paragraph 6. above.

B. Fillet Weld Sizes

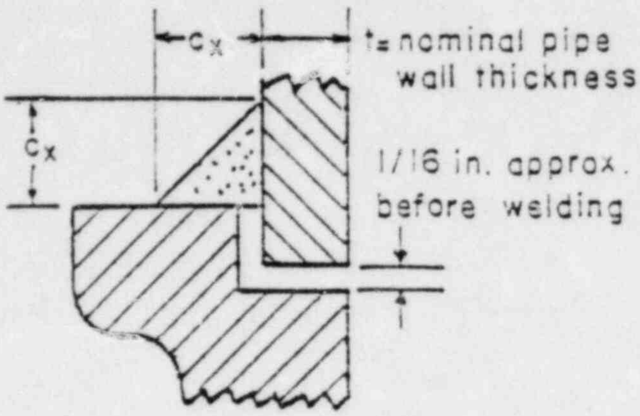
1. The minimum size of fillet welds used to attach socket fittings 2" diameter and under shall be not less than 1.09 times the thickness of the pipe or tube measured along the fillet weld leg and the throat dimension not less than .72 times the fillet weld leg size.

2. The minimum size of fillet welds used to attach socket welded flanges shall be not less than 1.4 times the thickness of the pipe or tube, or the thickness of the hub whichever is smaller; however, in any case the size shall be not less than 1/8" measured along the fillet weld leg. The throat depth shall be not less than .72 times the fillet weld leg size.

3. The minimum size of fillet welds used to attach slip-on flanges shall be not less than the thickness of the pipe or 1/4" whichever is smaller measured along the fillet weld leg. The throat depth shall be not less than .72 times the fillet weld leg size.

   NOTE: Reference figure 5.9.11 for graphic illustration of socket welding and slip-on flange fillet weld dimensions.

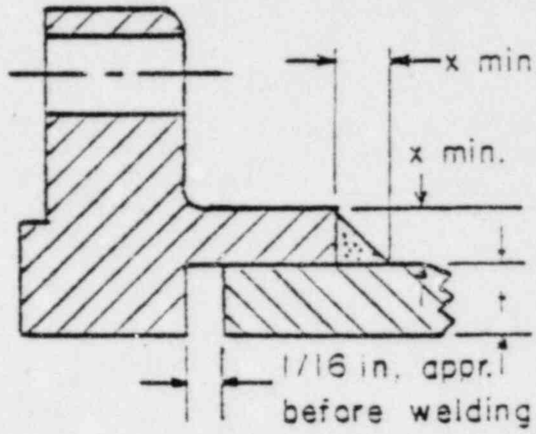
4. Fillet weld sizes for other applications shall be as specified by the applicable design specification and/or the applicable code.



C_x min. = 1.09 t

Minimum Welding Dimensions for Socket Welding Fittings

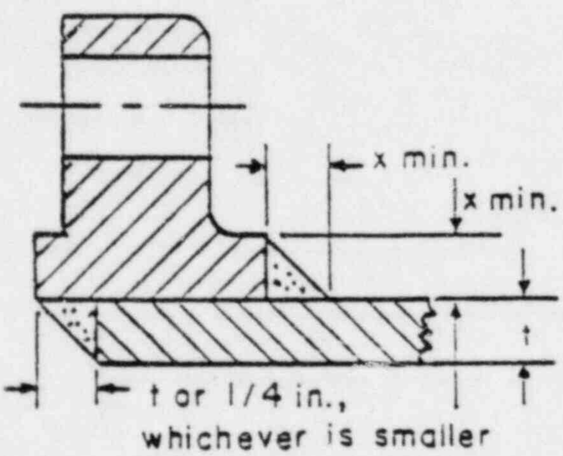
(a) Socket Welding Fitting



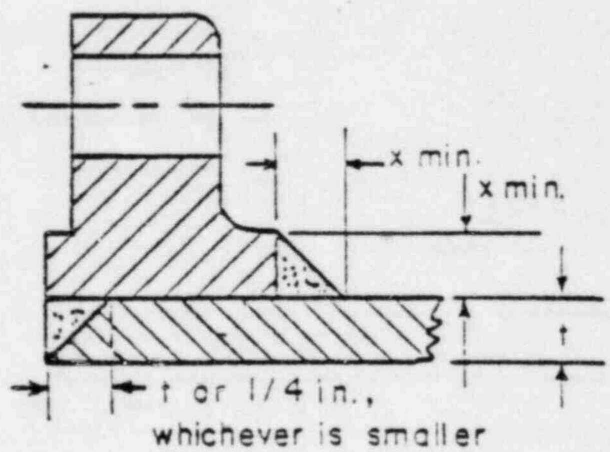
x min. = 1.4t or thickness of the hub, whichever is smaller

where t = nominal pipe wall thickness

(b) Socket Welding Flange



Front and Back Weld



Face and Back Weld

(c) Slip-on Flanges

Minimum Welding dimensions for slip-on and socket joints, as applicable

Figure No. 5.9.11

5. Other size fillet welds may be used provided the requirements of the applicable code are met and the dimensions are specified on the weld traveler.

5.10 Brazing Activities.

5.10.1 Base Metal Preparation.

A. The joint edges shall be prepared by machining, grinding or shearing and shall be in accordance with the dimensions specified on the BPS(s). No carbon air arc gouging or oxygen fuel cutting shall be permitted, unless specific authorization is granted by the Welding Supervisor. The brazing groove or joint shall be reasonably smooth, uniform and free from fins, tears, cracks and other discontinuities which would adversely affect the quality or strength of the brazed joint. If cutting oils are used they shall be completely removed with Magnaflux Cleaner-Remover, trisodium phosphate solution or other appropriate solvent-cleaners.

Prior to brazing, all surfaces 4 inches on each side of the joint, provided the work piece will accommodate this dimension, shall be free from foundry skin, scale, moisture, rust, sand, oxides, crayon or ink, residues, dirt or other deleterious materials. These materials may be removed by machining, wire brushing, appropriate solvents or grinding, or a combination of these processes may be used to remove these materials.

B. If brazing has not started within 2 hours after base metal preparation and cleaning, the joint may require protection with a suitable wrapping or covering. Upon removal of any required protective wrapping the braze joint shall be cleaned as described in paragraph A.

5.10.2 Fitup of Brazed Joints.

A. Fitup shall be accomplished by the use of mechanical devices and/or braze tacking, taking care to maintain the dimensions or tolerances specified on the applicable BPS(s).

5.10.3 Backing Rings.

A. Backing rings or lap rings shall be used when required by the applicable BPS(s), taking care to maintain the specified dimensions. These rings may be held in place by mechanical means and/or braze tacking.

5.10.4 Brazing Temperature, Flux and Atmosphere.

A. The brazing temperature range shall be maintained at the range specified on the BPS(s).

B. The brazing flux and/or atmosphere shall be as specified on the BPS(s).

5.10.5 Brazing Applications.

A. Brazed joints in a maximum nominal pipe size of 1" may be used only at dead end instrument connections and in special applications where space and geometry conditions prevent the use of other joints. The special applications shall be specified in the design specification.

B. Brazed joints that depend upon a fillet rather than a capillary type filler addition are not acceptable.

C. Brazed joints shall not be used in systems containing flammable liquids.

D. Soldered joints shall not be used in ASME Section III systems or components, and may only be used in other systems if permitted by the design specification.

5.10.6 Brazing Operations.

A. The applicable BPS(s), as shown on the Brazing Traveler, shall be used to perform the brazing operation following the brazing parameters and variables, tabulated or described in the BPS(s), such as temperature, flux, electrode type and size, atmosphere, gas, etc.

B. Brazing progression or direction of major flow shall be as shown on the BPS(s).

C. Complete joint filling is required for all brazing processes.

D. No brazing shall be performed on any item filled with water.

E. The work piece shall be protected from deleterious contamination and from rain, snow, and wind during brazing. Brazing shall not be performed on wet surfaces.

F. Any cracks, porosity or craters detected during or after completion of the brazing process shall be removed by grinding or chipping prior to proceeding with the brazing or testing, respectively.

5.11 Repair of Weld Metal Defects (ASME Section III).

5.11.1 Unacceptable defects in weld metal detected by the applicable NDE methods, hydrostatic, or leak testing shall be eliminated or the indications reduced to an acceptable limit and repaired if necessary.

5.11.2 Weld metal surface defects may be removed by grinding machining and not repaired by welding, provided that the requirements of A, B, and C below are met.

A. The remaining thickness of the section is not reduced that required by the applicable code.

B. The depressions, after defect elimination, is blended uniformly into the surrounding surface.

C. The area is examined after blending by a magnetic particle or liquid penetrant method meeting the requirements of the applicable code acceptance standards to ensure that the defect has been removed or the indication has been reduced to an acceptable limit.

5.11.3 Excavations in weld metal, when repaired by welding, shall meet the following requirements:

A. Unacceptable defects shall be removed by mechanical means or, if authorization is granted by the Welding Supervisor, by thermal gouging processes. The area prepared for repair shall be reasonably smooth and uniform and shall be examined by the magnetic particle or liquid penetrant method meeting the requirements of the applicable code acceptance standards. This examination is not required where defect removal essentially removes the full thickness and width of the weld in partial penetration or fillet welds; the area need only to be visually examined to determine the suitability for rewelding.

B. The weld repair shall be made using welding material, welders, and WPS(s) qualified in accordance with this procedure and the applicable code(s).

C. After repair, the surface shall be blended uniformly into the surrounding surface.

D. The examination of weld repair shall be repeated as required for the original weld, except that when the defect was originally detected by the liquid penetrant or magnetic particle method and when the repair cavity does not exceed the lesser of 3/8" or 10% of the thickness, it need only be re-examined by the liquid penetrant or magnetic particle method.

E. When permitted by the applicable code, repairs to welds joining P-1 and P-3 materials requiring examination by radiography as required in D. above, but construction assembly prevents meaningful radiographic examination, ultrasonic examination may be substituted, provided:

1. The weld had been previously radiographed and met the applicable acceptance standards;

2. The ultrasonic examination is performed using a procedure in accordance with Article 5 of ASME Section V Code and to the acceptance standards of the applicable code;

3. The substitution is limited to category A and B welds in vessels and similar type welds in other items. The absence of suitable radiographic equipment is not justification for the substitution.

5.12 Weld Repair of Base Metal Defects (ASME Section III).

5.12.1 Defects in material may be eliminated or repaired by welding provided the defects are removed, repaired and examined in accordance with the requirements of the applicable code for the applicable product form, except:

A. The limitation on the depth of the weld repair does not apply;

B. The time of examination of the weld repairs to the weld edge preparations, if required, shall be in accordance with the applicable code;

C. If required by the applicable code, a report shall be prepared as part of the repair documentation and shall include the following:

1. location and size of the prepared cavity,
2. welding material identification,
3. WPS(s),
4. any required heat treatment,
5. NDE examination results,
6. resulting thickness measurements;

D. The material is repaired using qualified welders, applicable WPS(s), and welding material which meets the requirements of the applicable code.

5.13 Repair of Weld Metal and Base Metal Defects (ANSI B31.1 and AWS D1.1).

5.13.1 Defects in base material and weld metal may be eliminated or repaired by welding, provided the requirements of the applicable construction code are complied with and any required non-destructive examinations are performed during and after the repair welding.

5.14 Defect Removal and Cavity Preparation of Weld Metal and Base Metal.

5.14.1 Defects may be removed and the resulting cavity prepared for welding by the methods described in 5.9.1, except the thermal gouging process.

5.14.2 The thermal gouging processes may only be used providing specific authorization is granted by the Welding Supervisor.

5.14.4 The wall thickness of the item, after elimination or fer repair of the defect, shall be verified to ensure that minimum wall thickness requirements are met by using the ultrasonic method or appropriate mechanical devices, as applicable. ith the applicable WPS(s).

5.14.5 Defects discovered on the final weld surface by the surface or visual examination methods shall be documented on the original Weld Traveler by stating the nature of the defect, method of repair, and recording the welder I.D. and welding electrodes to be used.

5.14.6 Defects discovered by the volumetric examination methods shall be documented by initiating a new Weld Traveler. The original Weld Traveler, if any, shall describe the nature of the defect and reference the new Weld Traveler. The new Weld Traveler may contain modified information, including additional repair instructions to be used.

5.14.7 Repairs not requiring the addition of filler material need only be documented on an NCN in accordance with A-NQCP-2. A log or record of these NCN's may be kept by the Welding Supervisor, or his designated alternate, stating the extent of the defect, the mechanical method by which the defect was removed and subsequent non-destructive examination including verification of minimum wall thickness readings after the repair has been completed.

5.15 Post Weld Heat Treatment Requirements.

5.15.1 ASME Section III Class 1, 2, and 3 Components.

A. P-1 Material (Carbon Steel).

1. Circumferential butt joints, including branch connections and socket welds, in material with a nominal wall thickness over 11/2" shall be post weld heat treated.

2. Circumferential butt joints, including branch connections or socket welds, in material over 3/4" and a maximum reported carbon content over .30% shall be post weld heat treated.

3. Fillet welds attaching non-pressure parts to pressure parts when the throat thickness of the fillet weld exceeds 3/4", regardless of pressure part wall thickness, shall be post weld heat treated.

4. Temporary attachment welds shall be post weld heat treated, after removal and blending as specified in 1. above.

B. P-3 (Low Alloy Steel) to P-1 (Carbon Steel).

1. All welds shall be post weld heat treated.

C. P-8 (Stainless Steel) to P-1 (Carbon Steel).

1. Post weld heat treatment of welds shall not be performed.

5.15.2 ASME Section III Class MC.

A. Welds in material constructed of carbon steel with a nominal wall thickness of over 1 1/2 inches shall be post weld heat treated.

5.15.3 ASME Section III Component Supports.

A. Welds in material constructed of carbon steel with a nominal thickness over 1 1/2 inches shall be post weld heat treated.

5.15.4 Post Weld Heat Treatment of other ASME Section III Items.

A. Post weld heat treatments of welds for other materials and thicknesses shall be in accordance with the requirements of the applicable code, except as exempted by figures 5.15.4-A(a), 5.15.4-A(b), 5.15.4-A(c) and 5.15.4-A(d).

5.16 ASME Section III Post Weld Heat Treatment Time, Temperature and Process Activities.

5.16.1 Post weld heat treatment minimum holding time and temperature shall be in accordance with figure 5.16.1(a).

5.16.2 Alternative holding time and temperatures as specified by the code may be used only with specific authorization from the Welding Supervisor.

5.16.3 Post weld heat treatment process activities shall be as follows:

A. PWHT shall be accomplished using electric resistance heating methods.

B. Only type K chromel-alumel thermocouples shall be used.

C. All recorders with thermocouples shall be calibrated in accordance with SAP-141.

D. The weld and/or item number, as applicable, or name shall be recorded on the strip chart.

E. The post weld heat treat cycle, including required heating and cooling rates, shall be recorded on a strip chart.

F. Air flow, if any, through the inside of piping shall be shut off, when practicable.

G. Thermocouple attachment clips shall be attached to the item using tack welds or by mechanical means.

H. Tack welds to valve bodies or to nozzles shall not be used unless specific authorization is granted by the Welding Supervisor.

I. PWHT clip tack welds, type size, and heat number of filler material, welder I.D. number, and the type and heat number of attachment material shall be recorded in the "Remarks" section of the Weld Traveler.

J. Tack weld clips shall be removed by grinding and the area from which removed shall be magnetic particle or liquid penetrant examined.

K. There shall be a spare thermocouple installed in the event of a recording thermocouple burnout.

L. For structural welds, the recorder thermocouples shall be placed as required to record the temperature along the length of the weld and heated band.

M. Unless otherwise specified by this procedure or the applicable code, the heated band shall extend a minimum of 2 times the nominal thickness of the material on each side of the weld and shall encompass the entire cirumference of the item.

N. Thermocouple ends shall be covered with high temperature putty to prevent inaccurate readings.

O. During the holding period there shall not be a greater difference than 100°F throughout the portion of the part being PWHT.

5.16.4 Except as specified by the code for P-6 and P-7 material, the rate of heating and cooling above 800°F shall not exceed 400°F/hour divided by the maximum thickness, but in no case more than 400°F/hour. Regardless of thickness, the rate of heating and cooling need not be less than 100°F/hour.

5.17 ANSI B31.1 Post Heat Weld Treatment Requirements.

5.17.1 Welds shall be post weld heat treated in accordance with the requirements of figure 5.17.1(a).

5.17.2 Notes following figure 5.17.1(a) shall be referenced and utilized for PWHT operations.

EXEMPTIONS TO MANDATORY PWHT

P-No. QW-420, Sect. IX		Type of Weld	Nominal Thickness	Properties of Pressure Retaining Material Being Joined: Max. Reported Carbon, %	Properties of Pressure Retaining Material Being Joined: Min. Preheat Req'd, °F
1	Vessels	Circumferential butt and socket welds connecting pipe and tubes to nozzles	1 1/4" and less	0.30 or less	...
			over 1 1/4" to 1 1/2"	0.30 or less	200
			3/4" or less	over 0.30	...
			over 3/4" to 1 1/2"	over 0.30	200
		Fillet welds	3/4" or less	...	200
		All welds, except repair welds, provided the welding procedure qualification is made in equal or greater thickness than the production weld	5/8" or less	0.25 or less	200
	Other components	All welds, except fillet, partial penetration, and repair welds in material over 1 1/2"	1 1/4" and less	0.30 or less	...
			over 1 1/4" to 1 1/2"	0.30 or less	200
			3/4" or less	over 0.30	...
			over 3/4" to 1 1/2"	over 0.30	200
		Fillet, partial penetration and repair welds in material over 1 1/2"	3/4" or less	...	200
3 except Gr. 3		All welds, except repair welds in vessels, provided weld procedure qualification is made in equal or greater thickness than production weld	5/8" or less	0.25 or less	200
		Attachment welds joining non-pressure-retaining material to pressure retaining material	1/2" or less	0.25 or less	200
		Circumferential butt welds or socket welds in pipe and tubes	1/2" or less	0.25 or less	200
4		Circumferential butt welds in pipe and tubes with nominal O.D. 4" or less and attachment welds	1/2" or less	0.15 or less	200
5		Circumferential butt welds in pipe and tubes with maximum reported chromium 3.00% or less and nominal OD. 4" or less and attachment welds	1/2" or less	0.15 or less	300
7		Type 405 and 410 welded with A-No. 7,. A-No. 8, or F-No.43 filler metal	3/8" or less	0.08 or less	...
1, 3		For vessel repair without required PWHT, see NB 4640	...	...	350

FIGURE 5.15.4-A(a) ASME CLASS 1 AND 2

EXEMPTIONS TO MANDATORY PWHT

P-No. QW-420, Sect. IX	Type of Weld	Nominal Thickness	Properties of Pressure Retaining Material Being Joined	
			Max. Reported Carbon, %	Min. Preheat Req'd, °F
1	All welds, including repair welds, in material 1 1/2" and less	1 1/4" and less	0.30 and less	...
		over 1 1/4" to 1 1/2"	0.30 and less	200
		3/4" or less	over 0.30	...
		over 3/4" to 1 1/2"	over 0.30	200
	Fillet, partial penetration and repair welds in material over 1 1/2"	3/4" or less	...	200
3 except Gr. 3	All welds, except repair welds in vessels, provided weld procedure qualification is made in equal or greater thickness than production weld	5/8" or less	0.25 or less	200
	Attachment welds joining non-pressure-retaining material to pressure retaining material	1/2" or less	0.25 or less	200
	Circumferential butt welds or socket welds in pipe and tubes	1/2" or less	0.25 or less	200
4	Circumferential butt welds in pipe and tubes with nominal O.D. 4" or less and attachment welds	1/2" or less	0.15 or less	200
5	Circumferential butt welds in pipe and tubes with maximum reported chromium 3.00% or less and nominal O.D. 4" or less and attachment welds	1/2" or less	0.15 or less	300
7	Type 405 and 410 welded with A-No. 7, A-No. 8, or F-No. 43 filler metal	3/8" or less	0.08 or less	...
1, 3	For vessel repair without required PWHT, see ND 4640	...	...	300

FIGURE 5.15.4-A(b) ASME CLASS 3

EXEMPTIONS TO MANDATORY PWHT

P-No. QW-420, Sect. IX	Type of Weld	Nominal Thickness	Properties of Material(s) Being Joined: Max. Reported Carbon, %	Properties of Material(s) Being Joined: Min. Preheat Req'd, °F
1	All welds, including repair welds, in material 1 1/2" and less	1 1/4" and less	0.30 or less	...
		over 1 1/4" to 1 1/2" or less	0.30 or less	200
		3/4" or less	over 0.30	...
		over 3/4" to 1 1/2"	over 0.30	200
	Fillet, partial penetration and repair welds in material over 1 1/2"	3/4" or less	...	200
3 except Gr. 3	All welds	1/2" or less	0.25 or less	200
4	All welds in pipes or tubes with nominal O.D. 4" or less	1/2" or less	0.15 or less	250
5	All welds in pipes or tubes with maximum specified chromium 3.00% or less and nominal O.D. 4" or less	1/2" or less	0.15 or less	300
7	Type 405 and 410 welded with A-No. 7, A-No. 8, or F-No. 43 filler metal	3/8" or less	0.08 or less	...

FIGURE 5.15.4-A(c) ASME CLASS NF

EXEMPTIONS TO MANDATORY PWHT

P-No. QW-420, Sect. IX	Type of Weld	Nominal Thickness	Properties of Pressure Retaining Material(s) Being Joined	
			Max. Reported Carbon, %	Min. Preheat Req'd, °F
1	All welds, except welds attaching nozzles or penetrations to the vessel shell, in material 1 1/2" and less	1 1/4" or less	0.30 or less	...
		over 1 1/4" to 1 1/2"	0.30 or less	200
		3/4" or less	over 0.30	...
		over 3/4" to 1 1/2"	over 0.30	200
	Fillet, partial penetration and repair welds in material over 1 1/2", except welds attaching nozzles or penetrations to the vessel shell	3/4" or less	...	200
	All welds attaching nozzles with nominal I.E. 2" and less	3/4" or less	...	200

FIGURE 5.15.4-A(d) ASME CLASS NE

P-No. QW-420, Sect. IX	(1) Holding Temperature Range	Minimum Holding Time at Temperature For Weld Thickness (Maximum) (2)			
		1/2" or less	Over 1/2" to 2"	Over 2" to 5"	Over 5"
1, 3	1100-1250°F	30 min.	1 hr./in.	2 hr. plus 15 min. each additional inch over 2 inches	2 hr. plus 15 min. each additional inch over 2 inches
4	1100-1250°F	30 min.	1 hr./in.	1 hr./in.	5 hr. plus 15 min. each additional inch over 5 inches
5, 6 except P-6, Gr. 4	1250-1400°F	30 min.	1 hr./in.	1 hr./in.	5 hr. plus 15 min. each additional inch over 5 inches
6, Gr. 4	1100-1500°F				
7	1300-1400°F	30 min.	1 hr./in.	1 hr./in.	5 hr. plus 15 min. each additional inch over 5 inches
11 and 11A	1100-1250°F	30 min.	1 hr./in.	1 hr./in.	1 hr./in.
8, 34, 42, 43, 45 and hard surfacing on P-1 base metal whose reported carbon content is not more than 0.30%	PWHT neither required nor prohibited				

(1) All temperatures are metal temperatures.

(2) Thickness of the thicker of the materials being PWHT.

FIGURE 5.16.1(a) ASME SECTION III ITEMS

FIGURE 5.17.1(a) ANSI B31.1 ITEMS

ASME Sect. IX P-Nos.	POST WELD HEAT TREATMENT (1)(2)		TIME CYCLE	
	(3)(4) Min. Wall and Other	(5)(6)(7)(8)(9) Temperature, Range, °F Min. - Max.	(3)(4) Hr./In. of wall	Min. Time within range, hours
P-1	Over 3/4" and ≤ .30% carbon	1100 - 1200	1	1
P-1	Over 3/4" and > .30% carbon	1100 - 1200	1	1
P-3	Over 1/2"	1200 - 1350	1	1
P-4	Over 1/2" or 4" nom. size or > .15% carbon	1300 - 1400	1	1
P-5 < 5% CR.	Over 1/2" or 4" nom. size or > .15% carbon	1300 - 1425	1	1
P-5 ≥ 5% CR.	All walls	1300 - 1425	1	2
P-6	All walls	1400 - 1500	1	2
P-8	All walls	None required	n/a	n/a

NOTES APPLICABLE TO FIGURE 5.17.1(a):

(1) Not applicable to dissimilar metal welds.

(2) Annealing or normalizing PWHT shall be in accordance with the WPS(s).

(3) Butt weld thickness is the thicker of the two abutting ends after end preparation, including I.D. machining.

(4) Socket, fillet and seal weld thicknesses are their throat thicknesses for pressure retaining and non-pressure retaining welds.

(5) PWHT temperature listed for each P-number is a recommended maximum temperature.

NOTES APPLICABLE TO FIGURE 5.17.1(a) (CONT'D):

(6) Heating rate for electric resistance is:

(a) For thickness 2" and under, the rate shall be 600°F per hour maximum.

(b) For thickness over 2", heating rate shall be 600°F per hour divided by 1/2 thickness in inches maximum.

(7) The weld shall be allowed to cool slowly in still air after wrapping the weld in insulating material.

(8) The minimum width of the PWHT band shall be the width of the weld plus 2" on each side of the weld, including branch connections.

(9) Process activities shall be in accordance with 5.16.3, except as modified herein.

5.18 AWS D1.1 Welded Items Post Weld Heat Treatment Requirements.

5.18.1 AWS D1.1 welded items, when required by the construction design specifications or new design specifications, shall be post weld heat treated in accordance with specific instructions prepared by the Welding Supervisor, or his designated alternate.

5.19 Post Braze Heat Treatment.

5.19.1 ASME Section III Class 1, 2 and 3 Components; ANSI B31.1; and AWS D1.1.

A. When required by the construction design specifications or new design specifications, post braze heat treatment shall be in accordance with specific instructions prepared by the Welding Supervisor, or his designated alternate.

5.20 Non-Destructive Examination.

5.20.1 ASME Section III Class 1, 2 and 3 Components.

A. All ASME Code welds or brazed joints, including repairs, shall have the appropriate NDE specified on the Weld or Braze Traveler, respectively.

B. Personnel performing the applicable NDE shall be qualified in accordance with the requirements of A-NQCP-8 or SAP-302, as applicable.

C. Non-destructive examinations shall be performed in accordance with the requirements of approved Quality Control Inspection Procedures, T-NQCP-2 through T-NQCP-9 or to approved contractor procedures which meet the requirements of SAP-302, as applicable.

5.20.2 ANSI B31.1 and AWS D1.1 Welded Items and Supports.

A. When required by the applicable construction design requirements or new design specifications, non-destructive examination personnel, procedures, and documentation shall meet the requirements of 5.13.1 above.

5.21 Removal Of Items Joined By Welding

5.21.1 The item or component may be removed in accordance with the requirements of SAP-133, when required, and in accordance with this procedure by machining, grinding or shearing.

5.21.2 Removal of items or components by thermal gouging processes can only be performed with specific written instructions from the Welding Supervisor. Such items or components shall be preheated in accordance with the requirements of this procedure. Thermal gouging processes shall be followed by machining or grinding to sound metal.

5.22 Calibration

5.22.1 Welding equipment instrumentation and post weld heat treatment recorders shall be calibrated in accordance with SAP-141.

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

WELDING PROCEDURE SPECIFICATION

WPS. No.________ WPS Designation ______________ Rev. __________ Date__________

1.0 SUPPORTING PQR(s)__________ 2.0 WELDING PROCESS(es)____________________
2.1 TYPE____________________

3.0 SCOPE ____

4.0 STANDARDS ____

5.0 PROCEDURE VARIABLES:

5.1 BASE METAL ____________
BASE METAL ____________
P No.(s) ____________
P No.(s) ____________
Group(s) ____________
Other ____________

AS WELDED:
Thk W/M Range MIN.________ MAX.________
Thk B/M Range MIN.________ MAX.________
Pipe Dia Range MIN.________ MAX.________

POSTWELD HEAT TREATED:
Thickness Range MIN.________ MAX.________
Pipe Dia Range MIN.________ MAX.________

5.2 MISCELLANEOUS PROCEDURE VARIABLES:

1. LAYER No.					
2. WELDING PROCESS					
3. FILLER METALS					
a. AWS Class					
b. SFA/AWS Spec No.					
c. F No.					
d. A No.					
e. Consumable Insert					
f. Filler Metal Dia.					
g. Flux Class					
h. Wire Feed Speed					
4. NON CONSUMABLE ELECTRODES					
a. Type					
b. Spec					
c. Class					
d. Electrode Dia.					
5. GAS (% Comp/Flowrate)					
a. Shielding (Flowrate)					
(% Composition)					
b. Backing (Flowrate)					
(% Composition)					
c. Trailing (Flowrate)					
(% Composition)					
6. TECHNIQUE					
a. Stringer/Weave					
b. Orifice/Gas Cup Size					
c. Oscillation					
d. Contact Tube to Work Dist.					
e. Mult/Single Electrode					
f. Travel Speed (in/min)					
7. ELECTRICAL CHARACTERISTICS					
A. Polarity					

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

WELDING PROCEDURE SPECIFICATION

WPS No. ________ WPS Designation ______________

Revision ________ Date ______________

5.2.7 ELECTRICAL CHARACTERISTICS

LAYER					
CURRENT					
VOLTAGE					

5.2.8 POSITION

Position of groove ______________
Welding Progression ______________
Other ______________

5.2.10 PREHEAT

Preheat Temp. ______________
Interpass Temp. ______________
Preheat Maintenance ______________
Other ______________

5.2.9 TECHNIQUE

Initial/Interpass
Cleaning ______________
Method of Back Gouging ______________
Mult/Single Pass (per side) ______________
Other ______________

5.2.11 POSTWELD HEAT TREATMENT

Temperature Range ______________
Time Range ______________
Other ______________

5.2.12 JOINT DETAILS

Joint Design ______________

Backing Mat. ______________

Other ______________

5.2.13 ADDITIONAL INSTRUCTIONS:

PREPARED BY ______________ DATE ________ REVIEWED BY ______________ DATE ________

APPROVED BY ______________ DATE ________ ISSUED BY ______________ DATE ________

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

BRAZING PROCEDURE SPECIFICATION (BPS)

Company Name ______________________
BPS No. ______________ Date ________ Supporting PQR No. ____________

Revisions ______________ ________ ____________

Brazing Process(es) ______________ Type(s) ______________

BASE METALS (QB-402)

P-No ________ TO P-No. ________

Thickness Range ________

Method of Precleaning ________
Other ________

FILLER METALS (QB-403)

F-No. ________ Other ________
ASME Spec. No. ________
AWS Class No. ________
Size a/o Shape of Filler Metal ________
Other ________

BRAZING TEMPERATURE (QB-404)

Temperature Range ________
Other ________

BRAZING PROCESS (QB-404)

H-No. ________ Other ________
Other ________

BRAZING FLUX OR ATMOSPHERE (QB-406)

Flux Trade Name or Composition ________

Atmosphere for Furnace Brazing ________

(name or trade designation of the fuel used or the name or trade designation of the gas compressing the atmosphere (hydrogen, Ammo-Gas, etc.) and a statement regarding the designed character of the furnace atmosphere, e.g., whether it is reducing, decarburizing, inert, etc.)

FLOW POSITION (QB-407)
Flow Position(s) ________
Method of Applying Filler Metal ________

(face feeding, preplaced rings, shims, spray deposit, cladding, etc.)

Other ________

Joints (QB-408)

Type of Joint(s) ________
Joint Clearance ________
Length of Overlap ________
Other ________

POSTBRAZE HEAT TREATMENT

Type of aging or stablizing thermal

____

POSTBRAZE CLEANING (QB-409)

Method of cleaning ________

PREPARED BY: ________ DATE ________ APPROVED BY: ________ DATE ________

REVIEWED BY: ________ DATE ________ ISSUED BY: ________ DATE ________

SOUTH CAROLINA ELECTRIC AND GAS COMPANY
WELDING PROCEDURE
QUALIFICATION RECORD
PQR No. ____________

1.0 SUPPORTING WPS(s) ____________ DATE ____________
2.0 WELDING PROCESS(es) ____________
2.1 TYPE ____________
3.0 SCOPE ____________

4.0 STANDARDS ____________
5.0 PROCEDURE VARIABLES:
5.1 JOINT DETAILS:

Joint Design ____________
Backing Mat. ____________
Other ____________

5.2 BASE METALS:

Material Spec(s) ____________
Grade(s) ____________
P No.(s) to ____________
P No.(s) ____________
Thickness ____________
Pipe Dia. ____________
Other ____________

5.3 FILLER METALS:
F No. ____________ Other ____________
A. No. ____________ Other ____________
SFA Spec No. ____________
AWS No. (Class) ____________
Size of Electrode ____________
Consumable Insert ____________
Other ____________

5.4 POSITION:
Position of Groove ____________
Welding Progression ____________

5.5 PREHEAT:
Preheat Temp. ____________
Interpass Temp. ____________
Preheat Maintenance ____________

5.6 POSTWELD HEAT TREATMENT:

Temperature Range ____________
Time Range ____________

5.7 GAS:
Shielding (% Comp) ____________
Flow Rate ____________
Backing (% Comp) ____________
Flow Rate ____________
Trailing (% Comp) ____________
Flow Rate ____________

5.8 TECHNIQUE:
String or Weave Bead ____________
Orifice/Gas Cup Size ____________
Initial/Interpass Cleaning ____________

Method of Back Gouging ____________
Oscillation ____________
Contact Tube to Work Dist. ____________

Mult/Single Pass (Per side) ____________

Mult/Single Electrodes ____________
Other ____________

5.9 OTHER PROCEDURE VARIABLES:

WELDING PROCESS						
LAYER NUMBER						
TRAVEL SPEED in/min						
AMPERAGE RANGE						
POLARITY						
VOLTAGE						
ELECTRODE DIAMETER						
TUNGSTEN TYPE						
FILLER METAL DIAMETER						
MODE OF METAL TRANSFER						
WIRE FEED SPEED						

6.0 TESTS, EXAMINATIONS AND INSPECTIONS

6.1 TENSILE TEST: Test Report No.

Specimen No.	Width (in.)	Thickness (in.)	Area (in.)	Ultimate Total Load (lb.)	Ultimate Unit Stress (psi)	Character of Failure & Location

6.2 GUIDED BEND TESTS: Test Report No.

Type and Figure No.	Result

6.3 TOUGHNESS TESTS: Test Report No.

Specimen No.	Notch Location	Notch Type	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break

6.4 FILLET WELD TEST:
Test Report No. ____________________
Results ____________________
Other ____________________

6.5 NONDESTRUCTIVE TEST/EXAMINATION:
Type of Test/Examination ____________________
Test/Examination Report No. ____________________
Results ____________________
Other ____________________

6.6 VISUAL INSPECTION/EXAMINATION:
Inspection Report No. ____________________
Results ____________________
Other ____________________

6.7 OTHER TESTS/EXAMINATION(s) OR VERIFICATIONS:
Type of Test/Examination ____________________
Test/Examination Report No. ____________________
Results/Deposit Analysis ____________________

Other ____________________

7.0 WELDERS NAME/ID ____________________

8.0 PROCEDURE QUALIFICATION SUPERVISED BY ____________________

9.0 We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of:

____

PREPARED BY	DATE	REVIEWED BY	DATE
APPROVED BY	DATE	ISSUED BY	DATE

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

BRAZING PROCEDURE QUALIFICATION RECORD (PQR)

Company Name ____________________

PQR No. ____________________ Date ____________

BPS No. ____________________

Brazing Process(es) ____________________ Type(s) ____________

JOINTS (QB-408)

Type of Joint(s) ____________
Joint Clearance ____________
Length of Overlap ____________
Other ____________

Joint Design Used

BASE METALS (QB-402)

P-No. ________ to P-No. ________
Material Spec. ____________
Type or Grade ____________
Thickness ____________
Method of Precleaning ____________
Other ____________

FILLER METALS (QB-403)

F-No. ________ Other ________
ASME Spec No. ____________
AWS Class No. ____________
Size a/o Shape of Filler Metal ____________
Other ____________

BRAZING TEMPERATURE (QB-404)

Temperature Range ____________
Other ____________

BRAZING PROCESS (QB-405)

H-No. ________ Other ________
Other ____________

BRAZING FLUX OR ATMOSPHERE (QB-406)

Flux Trade Name or Composition ____________

Atmosphere for Furnace Brazing ____________

(name or trade designation of the fuel used or the name or trade designation of the gas compressing the atmosphere (hydrogen, dissociated ammonia, etc.) and a statement regarding the designed character of the furnace atmosphere, e.g., whether it is reducing, decarburizing, inert, etc).

FLOW POSITION (QB-407)

Flow Position(s) ____________
Method of Applying Filler Metal ____________

(face feeding, preplaced rings, shims, spray desposit, cladding, etc.)

POSTBRAZE HEAT TREATMENT (QB-409)

Type of aging or stabilizing thermal treatment after brazing ____________

_____ Full _____ Reduced Section

TENSILE TEST (QB-150)

Specimen No.	Dimensions Width	Thick	O.D.	Area	Ultimate Total Load, lb	Ultimate Stress, psi	Character of Failure and Location

GUIDED BEND TESTS (QB-160)

Type and Figure No.	Results

OTHER TESTS

pe of Test ____________________

Other ____________________

Brazer's Name ____________________ Clock No. ____________ Stamp No. ______

Tests Conducted by: ____________________ Laboratory Test No. ______

We certify that the statements made in this record are correct and that the test brazes were prepared, brazed and tested in accordance with the requirements of Section IX of the ASME Code.

PREPARED BY ____________________ Date ________ APPROVED BY: ____________ DATE______

REVIEWED BY ____________________ Date ________ ISSUED BY: ____________ DATE______

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

WM-1.0
ATTACHMENT IV
PAGE 1 OF 2
REVISION 2

WELDER STANDARD QUALIFICATION RECORD

NAME (Last, First, Middle)	Soc. Security No.	Symbol	Standard Qualification Test No. Rev.________
Material Specification & P No. ____________ to ____________	Thickness Range	Pipe Outside Diameter	
TESTED BY/DATE	Qualified for WPS(s)		

BEND TEST RESULTS

	Pos.	Specimen		Results	Pos.	Specimen		Results
PIPE	5G	Face	Side		2G	Face	Side	
	or	Face	Side			Root	Side	
	6G	Root	Side		5G	Face	Side	
		Root	Side			Root	Side	

	Pos.	Specimen		Results	Pos.	Specimen		Results
PLATE	1G	Root	Side		3G	Root	Side	
		Face	Side			Face	Side	
	2G	Root	Side		4G	Root	Side	
		Face	Side			Face	Side	

	Pos.	Specimen		Results	Pos.	Specimen		Results
FILLET	1F	Fracture			3F	Fracture		
		Macro				Macro		
	2F	Fracture			4F	Fracture		
		Macro				Macro		

RADIOGRAPHIC TEST RESULTS

	Pos.	Results	RT Report No.		Pos.	Results	RT Report No.
PIPE	2G			PLATE	1G		
	5G				2G		
	6G				3G		
					4G		

TEST INFORMATION

( ) Original Test ( ) Retest ( ) Minimum of six hours training completed

We certify that the statements in this report are correct and that the test welds were prepared, welded and tested in accordance with the requirements of ASME Section IX Code.

PROCESS	STANDARD QUALIFICATION TEST No.	
MATERIAL	FIGURE QW 463.	DATE:

POSITION(s)	THICKNESS	PIPE DIAMETER

JOINT DESIGN

Torch Gas Type and Flow (CFH)	Backing Gas Type and Flow (CFH)*	Preheat & Interpass Temp Range	Weld Progression	Current Type and Polarity

* Two layers or 3/16" whichever is greater

Layer No.	Welding Process	Filler Metal	F No.	Tungsten Diameter	Filler Metal Diameter	AMPS	VOLTS	Wire Feed IPM	Slope Turns

PREPARED BY _______________ DATE _______________ REVIEWED BY _______________ DATE _______________

APPROVED BY _______________ DATE _______________ ISSUED BY _______________ DATE _______________

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

WELDER PERFORMANCE CONTINUITY RECORD

WPCR ______________________________

NAME ______________________________

SYMBOL ______________________________

	DATE	PROCESS	WELDING TIME (Hours)	WELDING SUPERVISOR
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				

SECTION XI
Page __ of __

WELD TRAVELER
V. C. SUMMER NUCLEAR STATION, UNIT 1
SOUTH CAROLINA ELECTRIC & GAS CO.

WM-1.0
ATTACHMENT VI
PAGE 1 OF 1
REVISION 2

SYSTEM or COMPONENT (1)			WELD No. (2)	MWR No. (3)
CODE & CLASS (4)	MATERIAL THICKNESS (5)	DIAMTER (6)	PREHEAT/INTERPASS TEMP (7)	PWHT (8) YES NO
WELDING PROCEDURE (9)	FILLER MATERIAL (10)	NDE REQ'D (11)	PREPARERS SIGNATURE/DATE (12)	

PROCESS CHECK POINT SEQUENCE (13)		H	Q.C. INSPECTOR Verified/Date (14)	H	ANII Verified/Date (15)
A	Joint Cleanliness				
B	Possible Limited Access YES NO				
C	Excavation NDE				
D	Check Fit-up				
E	Purge (including Back Purge)				
F	Check Preheat prior to Root Pass				
G	Check Backgouging/Grinding				
H	Check Interpass Temperature				
	Check Interpass Temperature				
	Check Interpass Temperature				
I	Visually Inspect Completed Weld				
J	Check Delta Ferrite/Record in "Remarks"				

FILLER MATERIAL SIZE & TYPE	HEAT/LOT No.	WELDERS NAME	ID NO.	WELDING PROCEDURE USED/ Revision
(16)	(16)	(17)	(17)	(18)

NDE Results & Report No. (19) ______ QC INSPECTOR/DATE (19) ______

BASE MATERIAL
Spec & Heat No. (20) ______
Spec & Heat No. ______

QC INSPECTOR/DATE (20) ______

REMARKS: (21)

PWHT ACCEPTED: QC/DATE	(22)	W/S	(24)
FINAL ACCEPTANCE/DATE _/DATE	(23)	A/M M/S	(25)

MWR

Page ___ of ___

BRAZER STANDARD QUALIFICATION RECORD

Brazer Name ______________ Clock No. ______________ Stamp No. ______________

Brazing Process(es) ______________ Type(s) ______________

In accordance with Brazing Procedure Specification (BPS) ______________

Base Metal (QB-402): Material Spec. ______ to ______ of P-No. ______ To P-No ______
Type or Grade ______ ______
Thickness ______ ______
Plate or Pipe ______________ Diameter ______________

Filler Metal (QB-403): ASME Spec. No. ______ AWS Class No. ______ F-No. ______
Other ______________

Brazing Temperature (QB-404): Range ______________

Brazing Process (QB-405): H-No. ______________

Brazing Flux (QB-406): Trade Name or Composition ______________
Atmosphere for Furnace Brazing ______________

Flow (QB-407) Position(s): ______________
Method of Applying Filler Metal ______________

Joint (QB-408): Type(s) ______________

Joint Clearance ______________
Length of Overlap ______________
Other ______________

PEEL OR SECTIONING TEST RESULTS (QB-170 or QB-180)

Flow Position	Type and Fig. No.	Results

Tests Conducted by: ______________ Laboratory Test No. ______________

We certify that the statements made in this record are correct and that the test brazes were prepared, brazed, and tested in accordance with the requirements of Section IX of the ASME Code.

NOTE: Any essential variables in addition to those above shall be recorded on an Amendment to this attachment.

PREPARED BY: ______________ DATE ______________

REVIEWED BY: ______________ DATE ______________

APPROVED BY: ______________ DATE ______________

ISSUED BY: ______________ DATE ______________

NAME_____________________________

ID No.___________________________
(if applicable)

SKILL_____________________________

WELDER ID No.

DATE	SCOPE OF TRAINING	Initials of Instructor and Date	EXAMINATION SCORE (if applicable)	Initials of Examiner and Date

BRAZING TRAVELER
V. C. SUMMER NUCLEAR STATION, UNIT 1
SOUTH CAROLINA ELECTRIC & GAS CO.

WM-1.0
ATTACHMENT IX
PAGE 1 OF 1
REVISION 2

SYSTEM or COMPONENT (1)			BRAZE No. (2)		MWR No. (3)
CODE & CLASS (4)	MATERIAL THICKNESS (5)	DIAMETER (6)	BRAZING TEMP. (7)		PBHT (8) YES NO
BRAZING PROCEDURE (9)	FILLER MATERIAL (10)	NDE REQ'D (11)	PREPARERS SIGNATURE/DATE (12)		

PROCESS CHECK POINT SEQUENCE (13)	H	Q.C. INSPECTOR Verified/Date (14)	H	ANII Verified/Date (15)
A Joint Cleanliness				
B Possible Limited Access YES NO				
C				
D Check Fit-up				
E Purge (including Back Purge)				
F Check Preheat prior to Brazing				
G Check Backgouging/Grinding				
H Check Interpass Temperature				
Check Interpass Temperature				
Check Interpass Temperature				
I Visually Inspect Completed Braze Joint				

FILLER MATERIAL SIZE & TYPE	HEAT/LOT No.	BRAZERS NAME	ID NO.	BRAZING PROCEDURE USED/ Revision
(16)	(16)	(17)	(17)	(18)

NDE Results & Report No. (19)

QC INSPECTOR/DATE (19)

BASE MATERIAL

Spec & Heat No. (20)
Spec & Heat No.

QC INSPECTOR/DATE (20)

REMARKS: (21)

PBHT ACCEPTED: QC/DATE	(22)	W/S	(24)
FINAL ACCEPTANCE/DATE QC/DATE	(23)	AM-MS	(25)

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

WELDING MATERIALS PROCEDURE

WM-2.0

REVISION 2

JUNE 7, 1982

NON-CONTROLLED COPY

SAFETY RELATED

Larry B. Collier — 9-20-82
ORIGINATOR (of this revision) — Date

Jim Turkett — 9-23-82
QUALIFIED REVIEWER — Date

Approved:

M. D. Quinton — 9-24-82
ASST. MGR. MAINT. SERVICES — Date

OCT. 0 1 1982

LIST OF EFFECTIVE PAGES

PAGE	REVISION
i	2
ii	2
1	2
2	2
3	2
4	2
5	2
6	2
7	2
9	2
10	2

ATTACHMENTS	
ATTACHMENT I	2
ATTACHMENT II	2
ATTACHMENT III	2
ATTACHMENT IV	2
ATTACHMENT V	2
ATTACHMENT VI	2
ATTACHMENT VII	2

TABLE OF CONTENTS

1.0 PURPOSE OR SCOPE

1.1 This procedure establishes and implements the methods to control procurement, storage, issuance and proper disposition of unused and used welding electrodes.

2.0 REFERENCES AND GLOSSARY

2.1 References

2.1.1 Administration of Maintenance Welding SAP-302 and latest approved revision.

2.1.2 ASME Boiler and Pressure Vessel Code Section II Part C current edition and addenda.

2.1.3 ASME Boiler and Pressure Vessel Code Section III 1971 edition through summer 1973 addenda for code piping installation and original construction requirements for other code and safety - related items.

2.1.4 ASME Boiler and Pressure Vessel Code Section IX current edition and addenda.

2.1.5 ASME Boiler and Pressure Vessel Code Section XI 1977 edition through summer 1978 addenda.

2.1.6 Welding Maintenance Procedure WM-1 and latest approved revision.

2.1.7 Receiving Inspection QCP-R1 and latest approved revision.

2.2 Glossary and Definitions

2.2.1 Brazing Material - non-ferrous electrodes, wire, strips, backing rings, lap rings, and flux used to join metallic materials together by capillary action of a liquid between two closely spaced solid metallic pieces.

2.2.2 Contaminated - undesirable elements such as rust, oxides, scale, etc.

2.2.3 Welding material - ferrous or non-ferrous, as applicable, bare wire, bare spool wire, bare spool flux core wire, backing rings, consumable inserts, and covered or uncovered electrodes used to join metallic materials by fusing the welding material to two specifically spaced metallic pieces and to itself.

2.2.4 Radioactive Contaminated - undesirable source of radiation.

3.0 RESPONSIBILITIES

3.1 The rod room attendant has the responsibility for control of welding and brazing materials in the rod room including, but not limited to, warehouse procurement, receiving, rod room storage, and issuance, and proper dispositioning of unused and used electrodes.

3.2 The welder and brazer, as applicable, has the responsibility for field control of welding or brazing material including rod room requisition, transporting electrodes to work area, field storage, application in accordance with the appropriate WPS(s) or BPS(s), returning unused electrodes to the rod room and proper disposal of used electrodes.

3.3 Welder or brazer assistants, if any, may have the responsibility for rod room requisition of electrodes and transporting such electrodes to the work area.

3.4 SAP-302, "Administration of Maintenance Welding" establishes, describes, and delineates the responsibilities of other personnel associated with Maintenance Welding Program.

4.0 GENERAL

4.1 All procured and received safety-related welding and brazing materials shall conform to the requirements of the applicable code and the purchase requisition.

4.2 All required documentation shall be received from the supplier prior to, or with, the welding or brazing material, as applicable.

4.3 Welding material, brazing material and the applicable documentation content shall be inspected upon receipt in accordance with QCP-R1.

4.4 Any broken or unsealed containers shall not be received from the warehouse.

4.5 Covered welding electrodes shall be transported to the applicable rod room and/or rod ovens as soon as possible after issue from the warehouse.

4.6 Rod rooms and/or rod ovens, as applicable, shall be secured by locking when left unattended.

4.7 Rod room attendant personnel shall receive ample on-the-job training and classroom instruction in the proper methods of field storage, issuance and disposition of returned unused and used welding materials prior to their being assigned to these activities.

4.8 Welders, brazers and their assistants, if any, shall receive classroom and on-the-job training in the proper methods of field storage and control of welding and brazing materials, as applicable.

4.9 Training exercises will be documented on attachment VII of this procedure. These training records shall be issued, controlled, maintained and filed by the Welding Supervisor or his designated alternate(s) in the employee's plant training files.

5.0 PROCEDURE

5.1 Documentation

5.1.1 The records captioned below in this paragraph shall be issued, maintained, controlled and filed in accordance with the referenced subsection(s) of this procedure:

A. "Warehouse Welding/Brazing Material Issue Slip," Attachment I, Form VCS 202, subsection 5.2.1.

B. "Welding/Brazing Material Receiving Record," Attachment II, subsection 5.2.2.

C. "Holding Oven Temperature Record," Attachment III, subsections 5.2.8, 5.2.9, and 5.2.10.

D. "List of Personnel Authorized to Receive Welding/Brazing Material," Attachment IV, subsections 5.3.1 and 5.3.3.

E. "Field Welding/Brazing Material Requisition," Attachment V, Form VCS 203, subsection(s) 5.3.2, 5.3.3, 5.3.4, 5.4.1, 5.4.11, 5.5.1 and 5.5.6.

F. "Portable Caddie Temperature Verification Record, Attachment VI, subsection 5.3.6.

G. "Training Record," Attachment VII, subsection 4.9.

5.2 Rod Room Control of Welding and Brazing Material.

5.2.1 The warehouse Storeroom Clerk shall issue welding or brazing material, as applicable, to the rod room(s) upon receipt of a properly initiated and authorized "Warehouse Welding/Brazing Materials Issue Slip," Attachment I. The type, size, amount requested and date shall be entered on this issue slip by the Welding Supervisor or his designated alternate(s). The Welding Supervisor, or his designated alternate, shall affix signature and date in the space "Authorized By." The manufacturer, heat or lot number, and amount issued shall be entered by the Storeroom Clerk. The Storeroom Clerk shall affix signature and date in the space "Issued By." The yellow copy of the "Warehouse Welding/Brazing Materials Issue Slip," shall be returned to the Welding Supervisor; the pink copy shall be returned to the rod room; and the white copy will be retained by the Materials Section.

5.2.2 Upon receipt of welding and/or brazing material from the warehouse, the "Welding/Brazing Material Receiving Record," Attachment II, shall be initiated and completed by the rod room attendant. The type, size, heat or lot number, manufacturer and amount received shall be entered on this record. The rod room attendant shall affix signature and date the record in the appropriate column. Between the 1st and 10th of each calendar month or when the welding/brazing material receiving record has been completely filled out, whichever comes sooner, the rod room attendant shall forward this record to the Welding Supervisor for retention in a suspense file for one year. The rod room attendant shall maintain a copy of this record until all the listed applicable materials have been issued or otherwise utilized.

5.2.3 For those covered welding electrodes requiring storage in the controlled atmosphere of a holding oven, the rod room attendant shall attach to the front of each holding oven a sketch which specifies location, by the type, size, heat or lot number, and Q.C. tag number. As new heat or lot numbers are added to the holding ovens the sketch shall be changed accordingly.

5.2.4 Uncovered welding electrodes (bare wire) shall be stored in their original containers until issued for use. These containers shall be legibly marked with size, type, heat or lot number, and Q.C. tag number.

5.2.5 Stainless steel covered welding electrodes shall not be placed into holding ovens containing carbon or low alloy steel covered welding electrodes.

5.2.6 Code and safety related covered welding electrodes shall be placed into their respective heated holding ovens immediately upon removal from their containers. Only one size, heat or lot of covered welding electrodes may be placed in one location in the holding oven.

5.2.7 The Temperatures shown in figure 5.2.7(a) shall be maintained in the holding ovens for the respective types of covered welding electrodes.

FIGURE 5.2.7(a)

ELECTRODE TYPE AND/OR CLASS	HOLDING TEMPERATURE (°F)
E308L-16	175-275
E309-16	175-275
ENiCrFe-3	175-275
E7018	200-300
E8018 B2L	200-300
E8018 C3	200-300
E9018 B3L	200-300
Other (Low Hydrogen)	200-300

5.2.8 At the beginning of each working shift, the holding oven temperature shall be verified by the rod room attendant and the applicable data, including signature and date, shall be entered on the "Holding Oven Temperature Record," Attachment III.

5.2.9 Should the holding oven temperature not be within the specified range as shown in figure 5.2.7(a) all electrodes shall be removed from the affected holding oven and segregated for proper disposition. Such action shall be noted in the remarks section of Attachment III.

5.2.10 At the beginning of each month, between the 1st and 10th, the rod room attendant shall forward the Holding Oven Temperature Record to the Welding Supervisor for review and filing. This record will be kept in a suspense file for a minimum of 1 year, after which, it may be discarded.

5.2.11 Brazing electrodes shall be stored in their original containers until issued for use. These containers shall be legibly marked with type, size, heat or lot number, and Q.C. tag number.

5.3 Rod Room Issuance Control of Welding and Brazing Material.

5.3.1 A "List of Personnel Authorized to Receive Welding and Brazing Material", Attachment IV, hereinafter may be referred to as the "List", shall be initiated and issued by the Welding Supervisor to the rod room attendant. The "List" will be revised to remove and/or add names of personnel as circumstances require.

5.3.2 Welding or brazing electrodes shall be issued only upon receipt by the rod room attendant of a properly initiated and authorized "Field Welding/Brazing Material Requisition," Attachment V, hereinafter may be referred to as the "Welding Material Requisition". The Welding Material Requisition shall be authorized by the Welding Supervisor, or his designated alternate, and shall specify the welders name, I.D. number, MWR, type and size of electrodes, amount requested, and Q.C. tag number.

5.3.3 The rod room attendant shall verify that the individual receiving the material is authorized to receive such material by checking the "List". After this verification the rod room attendant shall complete the Welding Material Requisition by entering the heat or lot number, caddie number, amount issued; and then, affix signature, time and date. For safety-related or code welding the words "Safety -Related" shall be stamped or written on the Welding Material Requisition.

NOTE: Personnel training as welders or brazers in the test shop are not required to be on the "List".

5.3.4 The white copy of the Welding Material Requisition shall be retained by the rod room attendant; the yellow copy shall be forwarded to the Welding Supervisor; and the pink copy shall be kept by the welder until the unused and, if required, used welding electrodes have been returned to the rod room.

5.3.5 At the time of issue Safety-Related covered welding electrodes listed in Figure 5.2.7(a) shall be placed into portable caddies. These caddies shall be capable of obtaining a minimum temperature of 150°F.

5.3.6 A temperature check shall be performed every six months and recorded on the "Portable Caddie Temperature Verification Record", Attachment VI. The temperature check shall be performed by use of a calibrated thermometer. The "Portable Temperature Verification Record" shall be forwarded to the Welding Supervisor to be placed in a suspense file for minimum of one year, after which it may be discarded.

5.3.7 Only one type of welding material shall be issued at one time. Examples of the same type of welding material are:

A. E308L-16 and ER308L;or
B. E70S-2 and E7018

5.4 Field Control of Welding and Brazing Material

5.4.1 The welder or brazer, as applicable, shall have in his possession at all times the pink copy of the Welding Material Requisition except during periods of transporting welding or brazing materials to the work location as permitted by Paragraph 3.3 and after the welder or brazer has returned the applicable unused or used electrodes to the rod room.

5.4.2 The portable caddie shall be plugged into an appropriate electrical outlet near the work location as soon as possible after covered welding electrode issue from the rod room. The caddie shall remain plugged in at all times unless returning it to the rod room or moving it to another work location.

5.4.3 The lid on the caddie shall be kept closed at all times except for the removal of electrodes for welding activities.

5.4.4 The welder or his assistant, as applicable, shall check the caddie periodically for heat producing capability. In the event the caddie should be discovered to be defective, the welder shall return it, and the electrodes contained therein, to the rod room and notify the Welding Supervisor or his designated alternate(s) immediately in order that proper corrective action may be implemented.

5.4.5 Humidity and other environmental factors permitting, more than one covered welding electrode may be removed from the portable caddie for use at one time, however, no more than one hour's supply shall be removed at one time and these electrodes shall be kept in a welding pouch.

5.4.6 The maximum exposure time to the atmosphere outside the portable caddie for the various covered welding electrodes is shown in figure 5.4.6(a).

FIGURE 5.4.5(a)

ELECTRODE	(hours) MAXIMUM EXPOSURE TIME
E308L-16	4 hours
E309-16	4 hours
E7018	4 hours
ENiCrFe-3	4 hours
E8018 B2L	2 hours
E8018 C3	2 hours
E9018 B3L	2 hours
Other (Low Hydrogen)	2 hours

5.4.7 Unused electrodes, along with the portable caddie, when required to be issued, shall be returned to the rod room for proper disposition at the end of the working shift. The used electrodes shall be segregated from the unused electrodes prior to returning them to the rod room. Used welding electrodes (stubs) shall be discarded in a container marked "DO NOT USE".

5.4.8 Should unused covered welding electrodes exceed the maximum exposure time or become otherwise contaminated, return them to the rod room and notify the Welding Supervisor or his designated alternate(s) immediately.

5.4.9 Issued uncovered welding electrodes (bare wire) and brazing filler metal shall be kept in the welders or brazer's possession at all times, respectively, except as permitted by Paragraph 3.3.

5.4.10 If required, uncovered welding electrodes and brazing filler metal shall be cleaned with Magnaflux cleaner or equivalent to remove grease, oil or other solvent soluble contaminates prior to welding. If contaminated by penetrating oxides, scale, corrosion products or any other non-solvent soluble contaminant, segregate from satisfactory welding or brazing material, as applicable, for return to the rod room.

NOTE: A small amount of Surface Oxide on uncovered electrode may be removed with abrasive cloth; after which, the uncovered electrodes shall be cleaned using an approved solvent.

NOTE: Radioactive contaminated welding material shall be disposed of in accordance with Health Physic Procedures.

5.4.11 The welder or brazer, as applicable, shall return the pink copy of the Welding Material Requisition along with the unused and used, welding or brazing material, and the portable caddie (if issued) to the rod room at the end of the working shift.

5.4.12 In the event additional welding or brazing electrodes are needed during the shift to complete or continue welding, an additional caddie may be issued along with the applicable welding or brazing electrodes. However, all the requirements of this procedure applies to the issuance, control and return of both caddies along with the respective unused and used welding electrodes.

5.5 Rod Room Return Control of Welding and Brazing Material

5.5.1 The rod room attendant shall examine returned welding or brazing electrodes along with the appropriate pink copy of the "Welding Material Requisition."

5.5.2 If warm to the touch and no other contamination exists, the rod room attendant shall place the covered welding electrodes in their respective holding oven according to type, size and heat or lot number as shown on the sketch attached to the holding oven.

5.5.3 If cold to the touch or other physical contamination exists, the covered welding electrodes shall be discarded in a container marked "Do No Use".

5.5.4 If no deleterious contamination exists for brazing or uncovered welding electrodes, the rod room attendant shall return this material to their original containers according to type, size, and heat or lot number.

5.5.5 If penetrating contamination exists which cannot be removed by use of Magnaflux cleaner or equivalent, the rod room attendant shall discard the brazing or uncovered welding electrodes in a container marked "Do No Use".

5.5.6 The rod room attendant shall enter the amount of welding or brazing material, as applicable, returned to the rod room on the white copy of the Welding Material Requisition. The rod room attendant shall obtain the welder's or brazer's pink copy, as applicable, and attach it to the white copy. These copies shall be forwarded to the Welding Supervisor at least once per week. If required, the white copy(s) shall be inserted into the repair packet by the welding supervisor or his designated alternate(s).

5.6 Authorized Nuclear Inservice Inspector

5.6.1 For ASME Section XI code welding or brazing activities the applicable documentation will be made available, upon request, for the ANII's review.

Issue Material To:	FORM VCS-202

SOUTH CAROLINA ELECTRIC & GAS CO.

V. C. SUMMER NUCLEAR STATION

WAREHOUSE WELDING/BRAZING MATERIAL ISSUE SLIP

Material Type ______________ Size _________ Date _________

Manufacturer __________________ Heat/Lot No. _________

Amt. Requested __________________ Amount Issued _________

Issued By __________________ Date _________

Authorized By __________________ Date _________

Copy Distribution: WHITE-Materials Section; PINK-Rod Room; YELLOW-Welding Supervisor

WELDING MATERIAL RECEIVING RECORD

TYPE	SIZE	HEAT or LOT No.	MANUF.	AMOUNT RECEIVED	SIGNATURE	DATE

REMARKS:

HOLDING OVEN TEMPERATURE RECORD

OVEN NO.	TEMPERATURE	ELECTRODE TYPE	TIME	DATE	ATTENDANT NAME SIGNATURE

REMARKS:

LIST OF PERSONNEL AUTHORIZED TO RECEIVE
WELDING AND BRAZING MATERIAL

NAME	S/S NUMBER	DEPARTMENT	REMARKS

Welding Supervisor/Date

FIELD WELDING/BRAZING MATERIAL REQUISITION
SOUTH CAROLINA ELECTRIC & GAS CO.
V.C. SUMMER NUCLEAR STATION

Form: VCS-203

Issue Material To: (NAME)	Welder/Brazer (NAME)	WELDER I.D. Number

	SMAW	GTAW	GMAW	Other
ASME/AWS Type				
Size				
HEAT/LOT No.				
MWR				
CADDIE No.				
AMT REQUESTED				
AMT ISSUED				
AMT RETURNED				

Authorized by:	Date:	Issued By:	Time:	Date:

COPY DISTRIBUTION: WHITE-Rod Room; PINK-Welder; YELLOW-Welding Suprv.

PORTABLE CADDIE TEMPERATURE VERIFICATION RECORD

CADDIE NO.	TEMPERATURE	DATE	REMARKS

BY: ______________ DATE: __________

NAME________________________

ID No.________________________
(if applicable)

SKILL________________________

DATE	SCOPE OF TRAINING	Initials of Instructor and Date	EXAMINATION SCORE (if applicable)	Initials of Examiner and Date