

SOUTH CAROLINA ELECTRIC & GAS COMPANY  
 VIRGIL C. SUMMER NUCLEAR STATION  
 NUCLEAR OPERATIONS

NUCLEAR OPERATIONS

FOR INFORMATION ONLY

COPY NO. 44

QUALITY SYSTEMS PROCEDURE

QSP-211

INSERVICE EXAMINATION FOR COMPONENT SUPPORTS

REVISION 2

SAFETY RELATED

James C. Baker  
 DISCIPLINE SUPERVISOR

12/29/93  
 DATE

[Signature]  
 APPROVAL AUTHORITY

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 DATE

RECORD OF CHANGES

CHANGE LETTER	APPROVAL		DATE CANCELLED	CHANGE LETTER	APPROVAL		DATE CANCELLED
	INITIAL	DATE			INITIAL	DATE	

REFERENCE USE

Procedure Segments May Be Performed from Memory  
 Must Verify Work Following Each Segment.

TABLE OF CONTENTS

	<u>SECTION</u>	<u>PAGE</u>
1.0	<u>PURPOSE</u>	1
2.0	<u>REFERENCES</u>	1
3.0	<u>GLOSSARY</u>	2
4.0	<u>RESPONSIBILITY</u>	3
5.0	<u>GENERAL</u>	3
6.0	<u>EQUIPMENT</u>	9
7.0	<u>PERSONNEL REQUIREMENTS</u>	9
8.0	<u>PROCEDURE AND DOCUMENTATION</u>	10
9.0	<u>ACCEPTANCE CRITERIA AND CORRECTIVE ACTION</u>	11
10.0	<u>RECORDS</u>	11

## 1.0 PURPOSE

- 1.1 The purpose of this procedure is to develop, maintain and implement an Inservice Inspection Program for examination of ASME Code Class 1, 2 and 3 component supports.
- 1.2 The examination program recognizes the examination requirements of ASME Code, Section XI, as directed by 10 CFR50.55(A)g and the examination and testing requirements of the Virgil C. Summer Nuclear Station's Technical Specifications. Specific testing requirements for hydraulic and mechanical snubbers is accomplished by the "803" Series of Surveillance Test Procedures.

NOTE: ASME Code, Section XI, shall not supersede the requirement of any technical specification. Only where technical specifications are less limiting shall the Code requirement take precedence.

- 1.3 The effective date of this procedure, this revision, shall be 1-1-94.

## 2.0 REFERENCES

- 2.1 QSP-213, "NDE Inservice Examination Program"
- 2.2 V. C. Summer Technical Specifications
- 2.3 ASME Code, Section XI, 1989 Edition
- 2.4 STP-803.002, "Mechanical Snubber Visual Examination"
- 2.5 STP-803.003, "Mechanical Snubber Basic Operational Test"
- 2.6 STP-803.004, "Hydraulic Snubber Visual Examination"
- 2.7 STP-803.005, "Hydraulic Snubber Operational Test"
- 2.8 SAP-139, "Development of Safety and Non-Safety Related Procedures"
- 2.9 QSP-210, "Inservice Examination Non-Destructive Examination"
- 2.10 SAP-643, ASME Code, Section XI, Repair Program
- 2.11 QSP-100, "Development, Revision, Control and Distribution of Quality Systems Plans, Procedures and Instructions"
- 2.12 AI-104, "Qualification and Certification of Quality Control Examination Personnel"
- 2.13 ISE-1, "Inservice Inspection Manual"
- 2.14 QSP-505, "Visual Examination"
- 2.15 SAP-1141, "Nonconformance Control Program"

### 3.0 GLOSSARY

#### 3.1 Definitions

NOTE: Terms used throughout this procedure are defined in References 2.1 and 2.4. The following are provided for clarification.

- 3.1.1 Component Supports - For this procedure shall be those metal supports that are designed to transmit loads from the component and piping to the load carrying building and/or foundation structures. It also encompasses those structural elements relied upon to support the weight of or provide structural stability.
- 3.1.2 Encased Component Supports - Enclosed by using equipment or other structural products such that the enclosed item can only be visually observed by the removal of the equipment or structural products with resulting damage to the enclosing equipment or structural products.
- 3.1.3 Code - Shall mean ASME Code, Section XI, 1989 Edition
- 3.1.4 Code Class - Components classified in accordance with ASME Code, Section III and Section XI.
- 3.1.5 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 101, paragraph 9.0. (January 1, 1984)
- 3.1.6 Examination - Denotes the performance of all required visual observation and performance testing.
- 3.1.7 Replacement - As used in this procedure, includes spare and renewal component supports or parts of a component support.
- 3.1.8 Repair - Welding activities, including initial and surface finishing processes, required to return an item to a condition acceptable to the Code.
- 3.1.9 Rework - Replacement and/or other non-welding activities required to return an item to a condition acceptable to the Code.
- 3.1.10 Representative Sample - Shall include supports from the various configurations of operating environments and range of size and capacity of supports.
- 3.1.11 Test - As used in this procedure, refers to functional tests of hydraulic and mechanical snubbers.

- 3.1.12 Supervisor, Licensing and Operating Experience - That individual designated by the General Manager, Nuclear Safety, to act as liaison for South Carolina Electric and Gas Company Nuclear Operations (SCE&G/NO) and the United States Nuclear Regulatory Commission.
- 3.1.13 ANII - Authorized Nuclear Inservice Inspector.
- 3.1.14 ISE - Inservice Examination.
- 3.1.15 LCO - Limiting Conditions for Operations.
- 3.1.16 NDE - Nondestructive Examination.

#### 4.0 RESPONSIBILITIES

- 4.1 The Manager, Quality Systems, has overall responsibility for the administration and control of this procedure.
- 4.2 The Supervisor, Quality Control, has overall responsibility for the development, coordination and implementation of this procedure.
- 4.3 The examination personnel are responsible for the execution of the requirements assigned by this procedure.

NOTE: General responsibilities of V. C. Summer Nuclear Station personnel for the ISE Program are addressed in Reference 2.1. Those responsibilities specific to the examination and testing of component supports in the ISE Program follow.

#### 5.0 GENERAL

- 5.1 Components
  - 5.1.1 Code class 1, 2 and 3 systems component supports including snubbers, as identified in Manual ISE-1, Section 6.0 shall meet the examination requirements of the code unless specifically exempted by the Code. Component supports or snubbers may be exempted from examination because of excessively high radiation exposure zones or inaccessibility by design.
  - 5.1.2 Technical Specification hydraulic and mechanical snubbers which require examination and testing shall be inspected per Tech. Spec. requirements.

## 5.2 Preservice Examination

NOTE: The Preservice Examination Program for baseline examination was conducted in accordance with ASME Code, Section XI, 1974 Edition through summer 1975 Addenda. All subsequent preservice inspections will be in accordance with Reference 2.2 and/or 2.3.

Preservice testing and examination of component supports and snubbers required by subsection IWB, IWC and IWD of the Code was completed as part of the Thermal Expansion Program and through NRC Bulletin IEB 81-01. Operational preservice testing, to satisfy Technical Specification 4.7.7, was accomplished by initial performance of STP-403 Series Procedures. Subsequent preservice testing on new installations will be accomplished by STP-803 Series.

- 5.2.1 The Preservice Examination Report shall be maintained via plant records to serve as baseline data for comparison with Inservice Examination results.
- 5.2.2 A preservice examination of component supports, which are subject to the Inservice Examination Program, will be conducted following repair, alteration or replacements to establish new baseline data as required by IWA-7530 of the Code.

## 5.3 Inservice Examination

- 5.3.1 All component supports and snubbers addressed in Section 5.1 of this procedure will be subjected to inservice examination scheduling and examination as detailed in Manual ISE-1.
- 5.3.2 Inservice examinations and tests for snubbers will be conducted in accordance with the 803 Series of Surveillance Test Procedures or other approved procedures.
- 5.3.3 All inaccessible, permanently encased component supports may be exempted from the examinations required by IWF-2000.

## 5.4 Examination Schedule

- 5.4.1 Examination Interval for Component Supports.
  - A. Inservice examinations for component supports required by subsection IWF-2400 of the Code shall be completed during each of the inspection intervals for the service lifetime of the plant, as described in IWA 2430. The inspections shall be performed in accordance with the schedule shown in Manual ISE-2 and may be performed during either normal system operation or plant outages.

- B. Each examination interval may be decreased or extended by as much as one year. Adjustments shall not cause successive intervals to be altered by more than one year from the original pattern of intervals.
- C. In addition to B above, for plants that are out-of-service continuously for six months or more, the inspection interval during which the outage occurred may be extended for a period equivalent to the outage and the original pattern of intervals extended accordingly for successive intervals.
- D. Examination scheduling shall be determined by the plant refueling cycles. Initially this cycle was every 12 months; whereas, the present refuel cycle and examination sequence is every 18 months.
- e. When the results of component support inspections do not qualify as "acceptable by examination" in accordance with IWF-3000 of the Code, the examination schedule shall be adjusted as allowed by the Code in order to produce acceptable results through repair, replacement or evaluation.
- F. The examination interval for component supports replaced, added, modified or repaired during the service lifetime of the plant shall coincide with the remaining interval at the time of such action.

5.4.2 Examination Interval for Technical Specification Snubbers.

- A. Snubbers listed in Manual ISE-1, shall be examined visually per the specific code class criteria listed in Section 6.0 of ISE-1.

5.4.3 Inservice Testing for Tech. Spec. Snubbers in accordance with Tech. Spec. Manual requirements.

- A. Tech. Spec. snubbers shall be operationally tested at the following frequency:
  - 1. For hydraulic snubbers, at least once per 18 months during shutdown, a representative sample of 10% of the snubbers shall be operationally tested either in place or in a bench test. For each snubber which does not meet the operational test acceptance criteria of Technical Specification Manual 4.7.7.d or 4.7.7.f, an additional 10% of the snubbers shall be operationally tested until no more failures are found or until all snubbers have been functionally tested.

2. For mechanical snubbers, a representative sample of each type of snubber shall be operationally tested in accordance with Figure 4.7.1 (Technical Specifications Manual). On Figure 4.7.1, "C" is the total number of snubbers found with locking velocity, bleed rate or drag force not meeting the acceptance criteria. The cumulative number of snubbers tested is denoted by "N". At the end of each segment of testing, new values of "N" and "C" (previous segments plus current segment) shall be plotted on Figure 4.7.1. If at any time the point plotted falls in the "Accept" region, testing of that type snubber shall be terminated. When the point plotted lies in the "Continue Testing" region, additional snubbers shall be tested until the point falls in the "Accept" region or the "Reject" region, or all the snubbers of that type have been tested.
    - a. The representative samples selected for operational testing shall include the various configurations, operating environments and the range of size and capacity of snubbers. The representative samples shall be selected randomly from the total population.
  3. Snubbers of a representative sample which fail the operational test shall be retested during the next test period, but will not be included as part of the representative sample for that test period.
  4. For each snubber which does not meet the operational test acceptance criteria of Technical Specification 4.7.7.d or 4.7.7.f, an engineering evaluation will be conducted to determine the cause of failure and to identify other snubbers which may be subject to the same type failure. All other snubbers determined to be subject to the same type failure shall be operationally tested or otherwise determined operable.
- 5.4.4 Class 1 and Class 2 Supports Examination Frequency and Requirements.
- A. A representative sample of component supports shall be examined during each interval, as required by ISE-1 for the service lifetime of the plant.
  - B. The affected supports shall be visually examined (VT-3) in accordance with approved procedures.



- C. Supports, excluding snubbers, buried within the components insulation shall be examined to "the extent practical", in their installed position provided the support either carries the normal weight of the component or normally serves as a structural restraint in compression (IWF-1300(e)). Interferences such as welded structural components or design configurations of the support itself, excluding snubbers, are not required to be removed in order to perform the required inspections. Mechanically connected interferences need to be removed prior to examination. The use of optical aids is permitted.
- E. Supports buried within the components insulation that do not carry the normal weight of the component nor normally serves as a structural restraint in compression shall be examined after the removal of insulation. Mechanically connected interferences need to be removed prior to examination.
- F. Snubbers which are specifically required to be examined/tested by Technical Specifications need not be additionally examined to the requirements of ASME Section XI Code.
- G. Snubbers, which are not Tech. Spec but are required to be examined by ASME Section XI Code, shall be examined once per interval.

NOTE: Class 2 component supports exempted by IWC-1220 and/or IWC-1230 are not included in Manual ISE-1.

5.4.5 Class 3 Supports Examination Frequency and Requirements.

- A. A representative sample of component supports and restraints, tabulated in Manual ISE-1, shall be examined during each examination period of each interval for the service lifetime of the plant.
- B. The requirements of 5.4.4 (B), (C), (D) and (E) apply.
- C. Snubbers, which are not Tech Spec but are required to be examined by ASME Section XI Code, shall be examined once per period as detailed in Manual ISE-1.

## 5.5 Examination and Testing

### 5.5.1 Component Supports (Excluding Snubbers).

- A. The visual examination methods to be used for the component supports are specified in Table IWF-2500-1 of the Code. The two types of visual examinations required of the ISE component supports are as follows:
  - 1. VT-3 - This visual examination shall be conducted to determine the general mechanical and structural conditions of component supports. (IWA-2213)
  - 2. The examination shall include examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring type supports.
- B. The examination methods required to perform ISE will be under the administration of SCE&G approved procedures.
- C. Personnel performing the examinations or evaluating results will be qualified to the requirements of Quality Systems' AI-104.

### 5.5.2 Snubbers

- A. The visual examination methods to be used for inspections are specified in Technical Specification 4.7.7.b and ASME Section XI, Subsection IWF-5000.
- B. The examination methods required to perform ISE will be under the administration of SCE&G approved procedures.
- C. Personnel performing the examinations will be qualified in accordance with Quality Systems' AI-104.
- D. Visual examinations shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, and (2) that attachments to the foundation or supporting structure are secure.
- E. Operational testing of snubbers to meet Technical Specification requirements shall be conducted utilizing the 803 Series of Surveillance Test Procedures (STP's). The snubber operational test shall verify that activation (restraining action) is achieved within the specified range in both tension and compression for hydraulic snubber and that activation takes place in both directions of travel for mechanical snubbers. Additionally, fasteners for attachment of the snubber to the component and to the snubber anchorage are verified secure.

- 5.6 Removal, Reinstallation, Repairs, Replacements and Reworks for Component Supports, Including Snubbers.
- 5.6.1 Repairs of defects in welds or replacement, additions to and alteration of attachment welds in component supports/snubbers will be controlled by SAP-643 and/or SAP-1141.
  - 5.6.2 Successive examinations of repaired, added, altered or replaced component supports are addressed in Section 5.4 of this procedure.
  - 5.6.3 Removal, reinstallation and rework will be conducted in accordance with the applicable MMP-305 Maintenance Procedures.
- 5.7 Hanger Examination Plan
- 5.7.1 The hanger examination plan (Manual ISE-1) will be prepared, reviewed and approved prior to implementing the inspection, examination or testing requirements established in 5.4.4 and 5.4.5 of this procedure.
  - 5.7.2 The percentage of hangers requiring inspection shall be identified as required by ISE-1.
  - 5.7.3 The plan may be changed or modified providing the requirements of Manual ISE-1 and other code requirements are met.
- 5.8 ISE Hanger Examination Implementation
- 5.8.1 The Hanger Examination Plan will be implemented through the MWR program per SAP-601 and Manual ISE-1.
  - 5.8.2 Manual ISE-1 provides guidelines for selection, disassembling (when required), inspection, examination, re-assembling (when required), repairs, rework and retest of specific component supports identified in this procedure and in each ISE Plan.

## 6.0 EQUIPMENT

- 6.1 As needed.

## 7.0 PERSONNEL REQUIREMENTS

- 7.1 Personnel performing the examinations shall be qualified in accordance with AI-104.
- 7.2 Contractors/or subcontractors performing examinations shall either prepare written procedures or utilize existing QC procedures and qualify their personnel in accordance with requirements specified therein.
- 7.3 Contractors and/or subcontractors shall obtain a "Release to Work", when required by purchase order, from SCE&G QA prior to performing any work at V. C. Summer Nuclear Station.

## 8.0 PROCEDURE

- 8.1 The ISE Coordinator will assure the retention and maintenance of the records required by Technical Specification 6.10.2 (H), (I) and IWA-6310 of the Code until those records are transmitted to the plant's permanent records storage. These records must be maintained for the service lifetime of the component support or snubber. Records maintained shall include the following:
- 8.1.1 Examination plans and schedules which effectively track the status of the inservice examination of component supports, including snubbers. These plans and schedules will identify the component supports and snubbers which require examination and the point in the examination interval where the examination will be conducted. These schedules will be adjusted as necessary to account for plant outages, repairs, alterations, replacements or additions; successive examinations and any supplemental examinations or testing as may be required.
  - 8.1.2 Reports of examination and test results. These results provide a basis for evaluation and facilitate trending analysis.
  - 8.1.3 Reports of results evaluations.
  - 8.1.4 Reports of corrective actions, repair and replacement, to include: relative inspection/examination repair or replacement data sheets, radiographs, indication evaluations, etc.
  - 8.1.5 Copies of Inservice Examination Reports (Summary) filed with the NRC.
  - 8.1.6 Any newly performed preservice examination and test results (baseline or repair) to assure reference data for subsequent inservice inspections.
  - 8.1.7 Snubber service life is documented by construction records, Maintenance Work Requests, Modification Request Forms and Surveillance Task Sheets as appropriate to indicate the dates applicable to beginning of service life and the designated length of service life. (Reference letter CGSS-0616-NL)

NOTE: Mechanical snubbers have a designated service life of 40 years from initial installation. Hydraulic snubbers (S/G supports) have a designated service life of 40 years subsequent to seal modification performed by MRF 10634.

## 9.0 ACCEPTANCE CRITERIA/CORRECTIVE ACTION

- 9.1 Visual examination of integral welded supports attached to pressure retaining components shall be conducted in accordance with the requirements of IWA-2213 of the Code under the administration of QSP-210.

NOTE: When a visual examination indicates a surface flaw indication on a component support or snubber, it shall be unacceptable for continued service unless supplemental examinations (per IWF-3000 of the Code) show that flaw indications are within the acceptance criteria of the Code.

- 9.2 Snubbers which appear inoperable as a result of visual examination may be determined OPERABLE, and therefore be excluded from being counted as inoperable for the purpose of establishing the next visual inspection interval, providing that the cause of the failure is clearly established and remedied for that particular snubber and for any other snubbers that may be generically susceptible; Technical Specifications 4.7.7.d or 4.7.7.f as applicable.
- 9.3 For any snubbers found inoperable, an engineering evaluation shall be performed on the components which are supported by the snubber(s). The purpose of this evaluation shall be to determine if the components supported by the snubber(s) were adversely affected and to determine if continued service is acceptable.

## 10.0 RECORDS

- 10.1 Inspection records and the NIS-1 Summary will be controlled by QSP-213, Reference 2.1.
- 10.2 A Component Support Examination Summary shall be completed and become part of the final records at the end of each inservice inspection outage. This summary shall be used as part of the NIS-1 form.