

NUCLEAR OPERATIONS
COPY NO. _____

ISE-3

REVISION 1

SOUTH CAROLINA ELECTRIC & GAS COMPANY

V. C. SUMMER NUCLEAR STATION

ASME SECTION XI
INSERVICE EXAMINATION MANUAL
FOR 2ND INSPECTION INTERVAL

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V. C. SUMMER NUCLEAR STATION
INSERVICE EXAMINATION PROGRAM
2ND TEN YEAR INTERVAL

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COLUMBIA, SOUTH CAROLINA 29218

PLANT: V. C. SUMMER NUCLEAR STATION
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CAPACITY 1 UNIT of 900 MWE

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South Carolina Electric & Gas Company

V.C. Summer Nuclear Station

Second Ten Year Interval

Inservice Examination Program

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1.0

INTRODUCTION

This document details the Inservice Examination Program for South Carolina Electric & Gas Company's (SCE&G) V.C. Summer Nuclear Station (VCSNS), updated for the second 120-month inservice inspection interval. In accordance with U. S. Nuclear Regulatory Commission rules and regulations, the operating license for a pressurized water reactor (PWR) nuclear power facility is subject to certain conditions mandated in 10CFR50.55a(g)(4). As such, throughout the service life of VCSNS, nuclear power plant components - including supports - which are classified as ASME Code Class 1, Class 2, and Class 3, are required to meet the inservice inspection requirements¹ of the governing ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components". The purpose of this document is to detail the essential parameters which define the VCSNS Inservice Examination Program and, therefore, provide a basis for compliance of this ISE Program (commonly referred to as ISI in the nuclear industry) with the mandated rules and regulations.

The second 10-year inspection interval for VCSNS will commence on January 1, 1994, and end on January 1, 2004. In accordance with 10CFR50.55a paragraphs (g)(4) and (g)(5)(i), prior to the start of the inservice inspection interval, the inservice inspection program must be revised to incorporate Code editions and addenda as referenced in 10CFR50.55a(b). As such, the ASME Section XI Code of record for the updated second inservice inspection interval ISE Program is the 1989 Edition. This ISE Program has been prepared in accordance with, and complies with, the 1989 Edition of the ASME Section XI Code, hereafter, simply referred to as the Code. All references in this document to the Code, e.g. Examination Categories, Item Numbers, etc., refer to the 1989 Edition of the Code unless specifically stated otherwise through the use of relief requests.

¹Except design and access provision

1.1

SCOPE

VCSNS Class 1, 2, and 3 components subject to the rules and requirements of Code Subsections IWA, IWB, IWC, IWD, and IWF, (with the exception of Articles IWX-4000 and IWX-7000, which deal with repairs and replacements), are included within the scope of this document. In addition, this document may include augmented examination programs to comply with additional and/or supplemental examination requirements imposed by Regulatory Authorities or SCE&G recommendations and/or requirements.

1.1.1

Program Exclusions

Specifically excluded from the scope of this ISE Program are the inservice testing requirements of ASME Section XI, Article IWP and IWV (pump and valve testing), and Sub-article IWA-5000 (pressure testing). These requirements are contained in VCSNS's IST Program. Code Sub-articles IWX-4000 and IWX-7000 regarding repairs and replacements are also outside of the scope of this document and are contained in VCSNS's document SAP-641, "ASME Section XI Repair Program".

The requirements of Code Article IWE, which addresses the inservice inspection of containments, are not mandated by 10CFR50.55a at this time, and therefore, are not included within the scope of this document.

1.2

BACKGROUND

The V.C. Summer Nuclear Station consists of a one unit, 2775 MWT thermal, approximately 900 MWE, 3 loop, Westinghouse Pressurized Water Reactor (PWR).

The first inservice inspection interval for VCSNS commenced on January 1, 1984, coincident with unit commercial operation, and ended on January 1, 1994. The Code of record for the first inservice inspection interval was the

1977 Edition, Summer 1978 Addenda of ASME Section XI, except as modified by 10CFR50.55a(B)(2)(iv)².

Per 10CFR50.55a(g)(4)(ii), the governing Code for subsequent inservice inspection intervals is the latest edition and addenda of the Code incorporated by reference in the regulations (10CFR50.55a(b)) 12 months prior to the start of the inspection interval. Given a January 1, 1994 start-of-interval date, the Code governing the second inservice inspection interval for VCSNS is the 1989 Edition of ASME Section XI. This is based on Code of Federal Regulations, Title 10, Part 50, as revised by Federal Register, Vol. 57, No. 152, dated August 6, 1992, which references the 1989 Code Edition, effective September 8, 1992, therefore, any inspection interval commencing after September 8, 1993, must comply with the 1989 Edition of ASME Section XI.

1.3 APPLICABLE DOCUMENTS

1.3.1 Regulatory Documents

- 1.3.1.110 CFR50, Code of Federal Regulations, Title 10, Part 50 as revised by Federal Register, Vol. 57, No. 152 dated August 6, 1992, pages 34673 through 34676.
- 1.3.1.2 Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants", Revision 3, February 1976.
- 1.3.1.3 Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability", Revision 10, July 1993.

² Pressure-retaining welds in ASME Code Class 2 piping (applies to Tables IWC-2520 or IWC-2510-1, Category C-F). Appropriate Code Class 2 pipe welds in Residual Heat Removal, Emergency Core Cooling, and Containment Heat Removal Systems shall be examined. The extent of examination for these systems shall be determined by the requirements of paragraph IWC-1220, Table IWC-2520 Category C-F and C-G, an paragraph IWC-2411, in the 1974 Edition and Addenda through the Summer 1975 of Section XI of the ASME Code.

- 1.3.1.4 Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations", Revision 1 (Alternate Method).
- 1.3.1.5 NUREG-0800, Standard Review Plan For The Review Of Safety Analysis Reports For Nuclear Power Plants; Section 3.2.2, System Quality Group Classification
- 1.3.2 **Codes and Standards**
 - 1.3.2.1 **ASME Codes**
 - 1.3.2.1.1 American Society of Mechanical Engineers, Section V, "Nondestructive Examination", 1989 Edition
 - 1.3.2.1.2 American Society of Mechanical Engineers, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components", Division 1, 1989 Edition, except as noted by Relief Requests.
 - 1.3.2.2 **ASME Code Cases (See Section 4.1)**
 - 1.3.2.3 **ASME Nonmandatory Appendices**
 - 1.3.2.3.1 ASME Section XI, Nonmandatory Appendix A, "Analysis of Flaws", 1989 Edition
 - 1.3.2.3.2 ASME Section XI, Nonmandatory Appendix C, "Evaluation Of Flaws In Austenitic Piping", 1989 Edition
 - 1.3.2.3.3 ASME Section XI, Nonmandatory Appendix F, "Preparation of Inspection Plans", 1989 Edition
 - 1.3.2.4 **ASNT SNT-TC-1A, 1984 Edition**

1.3.3 **SCE&G Documents**

- 1.3.3.1 VCSNS Final Safety Analysis Report
- 1.3.3.2 VCSNS Operating License and Technical Specification
- 1.3.3.3 SCE&G Company Operational Quality Assurance Plan
- 1.3.3.4 SAP-145 - ASME Section XI Pressure Testing Program
- 1.3.3.5 SAP-641 - ASME Section XI Repair Program
- 1.3.3.6 STP-804.901 - Eddy Current Examination of S/G Tubing
- 1.3.3.7 STP-803.003 - Mechanical Snubber Basic Operational Test
- 1.3.3.8 STP-803.005 - Hydraulic Snubber Operational Test

1.3.4 **Definitions**

- 1.3.4.1 **Augmented Requirements** - Those NDE or tests required/recommended by documents other than ASME Section XI, such as; Regulatory Guides, NUREG's, NRC Generic Letters, I.E. Bulletins/Notices, FSAR, Technical Specifications, manufacturer's recommendations, etc.
- 1.3.4.2 **Authorized Nuclear Inservice Inspector (ANII)** - A person employed and qualified by an Authorized Inspection Agency to verify that NDE, test, and repairs and replacements (excluding welding and brazing) are performed in accordance with the rules of ASME Section XI.
- 1.3.4.4 **Code** - ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant components," 1989 Edition without Addenda.
- 1.3.4.5 **Component** - An item in a nuclear power plant such as a vessel, pump, valve, etc. Component may also be used to refer to systems or portions of systems such as welds, bolting, and supports.

- 1.3.4.6 **Form NIS-1, Owners' Data Report for Inservice Inspections** - An ASME form used to document the results of Inservice Inspection examinations on Class 1 and 2 components. It is to be used as the certification page for submittal of the ISI Summary Report.
- 1.3.4.7 **Form NIS-2, Owners' Report for Repairs or Replacements** - An ASME form used to document the results of repair or replacement activities. It will be submitted as part of the ISI Summary Report at the end of each refueling outage.
- 1.3.4.8 **Inservice Examination (ISE)** - Those Nondestructive Examination (NDE) including visual examinations performed on certain Class 1,2, and 3 components and their supports throughout the operating life of the nuclear plant, as required by ASME Section XI, subsections IWA, IWB, IWC, IWD, and IWF.
- 1.3.4.9 **Inservice Inspection Summary Report** - The report that is prepared at the completion of each refueling outage as specified in ASME Section XI.
- 1.3.4.10 **Inspection Interval** - As defined by regulations, a ten year time interval, during which the ISE program is applicable using a specific Edition and Addenda of ASME Section XI. The first ten year inspection interval commences on the date of commercial operation with the successive intervals beginning on the date the previous interval ends. An inspection interval length may be increased or decreased up to one year, to correspond with plant outages. Additionally, the interval may be extended for a period equivalent to an outage, which extends continuously for six months or more.
- 1.3.4.11 **Inspection Period** - A time frame approximately equivalent to one third of an interval. It is used for apportioning the implementation of ISE Program NDE during the interval.

- 1.3.4.12 **ISE Program Document** - The document (including applicable drawings) which addresses the overall ISE requirements during a ten year interval.
- 1.3.4.13 **ISE Tables** - The unit specific listing of the total population of items such as welds, bolting, components, supports, and portions of systems which are subject to examination, and repair and replacement during the ten year interval (i.e., all nonexempt components). These listings are included within the ISE program Document, and, as a minimum, identify items selected for examination along with examination frequency requirements and other mandatory requirements, if special consideration is applicable. These tables provide the primary basis for development of the ISE Implementing Plan.
- 1.3.4.14 **ISE Implementing Plan** - The listing of nonexempt components identified in the ISE Tables, with the information necessary for implementation of examinations. This listing should include as a minimum, such information as: components selected for examination; scheduling information; applicable NDE methods; and calibration blocks, etc.
- 1.3.4.15 **ISE Outage Plan** - A listing of those components identified in the ISE Implementing Plan which are required to be examined during a particular outage.
- 1.3.4.16 **Nondestructive Examination (NDE)** - Any of several physical, optical, chemical, electrical, or electromagnetic tests used primarily to examine items for surface or internal defects without destroying the items or impairing their function. Also known as Nondestructive Testing (NDT) and includes visual, surface, and volumetric methods.
- 1.3.4.17 **Position Statement** - An ISE Program record which documents the details of positions taken by SCE&G with respect to generalized Code requirements. These records amplify the Code requirement and provide consistent guidance for the implementation of the requirement.
- 1.3.4.18 **Preservice Inspection (PSI)** - Those Nondestructive Examinations (NDE) including visual examinations performed on certain ASME Class 1, 2, and 3

components and their supports once, prior to initial plant operations as part of the Preservice Inspection Program, or following a component repair, replacement, or modification. The results of these examinations provide a baseline for comparison to subsequent ISE required examinations.

1.3.4.19

Regulatory Authority - The United States Nuclear Regulatory Commission, empowered to issue and enforce federal regulations influencing design, construction, and operation of nuclear power plants.

1.3.4.20

Relief Request - A written request submitted to the regulatory authority which identifies specific components which would be impractical to be examined or tested in accordance with ASME Section XI requirements. It includes the reason these requirements are impractical to meet and technical justification for performing an alternative to the requirements.

1.3.4.21

Structural Discontinuity Welds - Includes circumferential weld joints at pipe to vessel nozzle, pipe to valve body, pipe to pump casing, and pipe to fittings. For the purposes of this ISE program, fitting-to-fitting welds and pipe-to-pipe welds having a schedule change, shall also be considered structural discontinuities.

1.3.4.22

Terminal End Welds - The extremities of piping runs that connect to structures, components, or pipe anchors, each of which acts as a rigid restraint or provides at least two degrees of restraint to piping thermal expansion (reference IWA-9000).

1.3.5

Abbreviations and Acronyms

ANI	Authorized Nuclear Inservice Inspector
ASME	American Society of Mechanical Engineers
CS	Carbon Steel
FSAR	Final Safety Analysis Report
ISE	Inservice Examination
MT	Magnetic Particle type examination
NDE	Nondestructive Examination

NDT	Nondestructive Testing
NPS	Nominal Pipe Size (inches)
NRC	Nuclear Regulatory Commission
PT	Liquid Penetrant type examination
SCE&G	South Carolina Electric & Gas Company
SD	Structural Discontinuity (weld)
SS	Stainless Steel
TE	Terminal End (weld)
UT	Ultrasonic type examination
VCSNS	V.C. Summer Nuclear Station
VT	Visual type examination
10CFR50	Title 10, Code of Federal Regulations, Part 50
IWX	Reference to Section XI Subsection IWA, IWB, IWC, IWD, IWF

2.0 GENERAL REQUIREMENTS

2.1 RESPONSIBILITIES

2.1.1 Owner

The South Carolina Electric & Gas Company (SCE&G), as the organization legally responsible for the operation, maintenance, safety, and power generation of VCSNS, is designated as Owner of this ISE Program. As such, SCE&G is responsible for the preparation, maintenance, and implementation of this ISE Program in accordance with IWA-1400 of the Code.

SCE&G, as Owner, is also responsible for contracting for the services of an Authorized Inspection Agency and for providing adequate access for the Authorized Nuclear Inservice Inspector (ANII) to perform the necessary inspection services (IWA-2130).

2.1.2 Inspection Agencies

The Authorized Inspection Agency, and the ANII, have been empowered by the jurisdictional enforcement authority to verify that examinations performed in accordance with this ISE Program are done so in accordance with the rules and requirements of the Code. The duties of the ANII are defined in paragraph IWA-2110 of the Code.

2.2 SCOPE OF INSERVICE EXAMINATION

2.2.1 Classification of Systems, Portions of Systems, and/or Components

Application of Code rules to systems and components is facilitated by the assignment of safety or quality group classifications. That is, in accordance with paragraph IWA-1320, Articles IWB, IWC, and IWD rules apply to systems and components classified as Class 1, 2, and 3, respectively. VCSNS plant systems, portions of systems, and/or components, such as vessels, pumps, valves, piping systems, etc., have been reviewed for classification and

subsequent inclusion in this ISE Program. Guidance for establishing the VCSNS ISE classifications has been taken from:

- 10CFR50.2(v),
- Regulatory Guide 1.26,
- NUREG 0800, Section 3.2.2, and the
- VCSNS FSAR.

Piping and components within the reactor coolant pressure boundary and, piping and components of other systems containing water and/or steam, have been classified as Class 1, 2, or 3. VCSNS systems, portions of systems, or components, within the ISE boundaries, which have been constructed to a classification higher than the minimum class established in the component design specifications, have been classified for inservice examination in accordance with the overall system classification or the minimum design classification.

ISE classification of systems, portions of systems, and/or components are illustrated on the VCSNS ISE Boundary Classification Drawings (See Paragraph).

ASME Code Classes correspond with the safety classification depicted on the flow diagrams as follows:

<u>ASME Code Class</u>	<u>Flow Diagram Safety Class</u>
1	1
2	2a
3	2b

2.2.2

System Boundaries Subject to Inservice Examination

System boundaries have been established to identify the extent to which the rules and requirements of the Code need to be applied. Systems and components within these established boundaries are subject to governing Code rules.

Guidance for establishing the boundaries of this ISE Program has been taken from:

- 10CFR50.2(v),
- Regulatory Guide 1.26,
- NUREG 0800, Section 3.2.2,
- VCSNS FSAR
- Plant Piping System Flow Diagrams.

The ISE Program boundaries, as well as the system and component classifications, are illustrated on the VCSNS ISE Boundary Classification Drawings (See Paragraph).

2.3 QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL

Personnel performing all nondestructive examinations (NDE), as required by this ISE Program, will be qualified and certified using a written practice prepared in accordance with SNT-TC-1A, Subarticle IWA-2300 of the Code, and SCE&G written practice or equivalent.

2.4 EXAMINATION EQUIPMENT AND PROCEDURES

2.4.1 Calibration Standards

Calibration of ultrasonic examination equipment will be accomplished utilizing the calibration standards listed in Appendix A. Additional standards, as approved by SCE&G, may be designed and fabricated, as needed.

2.4.2 Examination Procedures

Nondestructive examinations, as required by this ISE Program, will be performed in accordance with written, qualified procedures.

2.5

PRESERVICE EXAMINATIONS

Preservice examinations of VCSNS components will be performed during the second 10-year inspection interval following repair, replacement, or correction of components, in order to establish a new preservice record. Preservice examinations will also be performed following modifications or the addition of new systems, portions of systems, or components within the scope of this ISE Program.

2.6

INSERVICE EXAMINATIONS

2.6.1

Inspection Schedule

Components required to be examined during the second 10-year inspection interval will be scheduled for examination predominately during plant refueling outages and/or extended maintenance outages. However, where practical, some examinations may be performed during plant operation.

2.6.1.1

Inspection Program B

The inservice examinations required by IWB, IWC, and IWD, and the examination of component supports and integral attachments during the second 10-year inspection interval, shall be completed in accordance with the requirements of Inspection Program B, of the Code, as illustrated in Figure 2.6-1.

Figure 2.6 - 1
 Inspection Program B

2nd Inspection Interval	Inspection Period	Minimum Examinations Completed, %	Maximum Examinations Credited, %
1/1/94-1/1/04	1st (3 years) 1/1/94-1/1/97	16	34
1/1/94-1/1/04	2nd (4 years) 1/2/97-1/1/01	50	67
1/1/94-1/1/04	3rd (3 years) 1/2/01-1/1/04	100	100

Inspection Program B not only establishes the distribution and duration of the inspection periods within the VCSNS second 10-year interval, but also establishes the distribution of examinations to be performed throughout the interval. With the exception of the examinations that may be deferred until the end of the inspection interval as specified in Tables IWX-2500-1, the required examinations in each Examination Category shall be completed as depicted in Figure 2.6-1 above.

2.6.1.2

Successive Examinations

Successive examination has two separate meanings in ASME XI. One meaning deals with repeatability of exams from one interval to the next. The other deals with reexamination of the same items at subsequent periods for only those items requiring corrective measures or accepted for continual service via analytical evaluation, as applicable. Our approach to this aspect of successive exams is included in Section 3.2.2 of this program.

To the extent practical, the sequence of VCSNS component examinations established during the first inspection interval will be repeated during the second 10-year inspection interval.

Successive examinations will also be invoked in the event flaw indications in VCSNS Class 1 and 2 components are evaluated as acceptable for continued service based on the results of an analytical evaluation. In this case, the area containing the flaw will be scheduled for re-examinations during (the) successive period(s) in accordance with Paragraphs IWB-2420 and IWC-2420 of the Code.

VCSNS Class 1, 2, and 3 component supports, whose examinations result in unacceptable conditions requiring corrective measures, will be subject to successive reexaminations in accordance with Paragraph - 2420, of Code Case N-491. That is, component supports whose examinations reveal conditions unacceptable for continued service, thereby requiring corrective action, will be re-examined during the next inspection period.

Successive inspection requirements for VCSNS Class 1, 2, and 3 integral attachments will be as per Relief Request RR-02. For Class 1 integral attachments, whose scheduled examinations reveal flaw indications which are evaluated as acceptable for continued service based on performance of an analytical evaluation, the rules of paragraph IWB-2420 will be applied; for Class 2 and 3 integral attachments, the rules of IWC-2420 will be applied. However, when unacceptable flaw indications are revealed during (unscheduled) examinations required as a result of identified component support deformation, SCE&G will perform and document an evaluation to ascertain the necessity of successive re-examinations of the flawed integral attachment(s).

Following completion of the required successive examination(s) for all affected VCSNS components, the examination schedules for those components containing flaw indications which have remained unchanged, and/or component supports requiring no further correction, will revert back to the original examination schedule.

2.6.1.3 **Additional Examinations**

VCSNS Class 1 and 2 component examinations (excluding VT-2 visual examinations), performed in accordance with the routine examination requirements of this ISE Program, which reveal flaw indications which exceed the prescribed acceptance standards will be extended to include additional examinations in accordance with IWB-2430 and IWC-2430. IWD does not contain any additional examination requirements for Class 3 components.

VCSNS Class 1, 2, and 3, component support examinations requiring corrective measures will be extended to include additional examinations in accordance with Paragraph -2430 Code Case N-491.

2.6.1.4 **Supplemental Examinations**

To assist in the evaluation of examinations of VCSNS components required by this ISE Program, particularly those examinations which detect flaws or the evidence of flaws, other examination methods and techniques, in

addition to those specified in the Code may be employed. These supplemental examinations may serve to:

- confirm the existence of a flaw or flaws,
- characterize the size, shape, orientation, and nature of the flaw(s), or
- declare a component as acceptable for continued service following an acceptable supplemental examination.

2.7

EXAMINATION REQUIREMENTS

VCSNS Class 1, 2, and 3 components within the scope of this ISE Program will be examined in accordance with the requirements specified in Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1, respectively, except as modified by relief requests. Component supports will be examined in accordance with the requirements found in Table 2500-1 of Code Case N-491; integral attachments will be examined in accordance with Relief Request RR-02. The applicable IWX-2500-1 tables were utilized by this ISE Program to define all the parameters/information necessary for implementation of the VCSNS component-by-component examination plan, including some or all of the following:

- Examination Categories and the type of components to be included within the category,
- Item Numbers and a breakdown of the types of parts to be examined within the Examination Category,
- Examination requirement figures,
- Examination methods,
- Examination acceptance standards,
- Extent of examination (including selection criteria, if any),
- Frequency of examinations, and
- Scheduling of examinations.

2.7.1

Examination Methods

The three types of examination methods to be utilized during inservice examinations in accordance with this ISE Program are visual, surface, and volumetric. The examination method to be utilized in examination of specific VCSNS Class 1, 2, and 3 components, or groups of components (except integral attachments), correspond with those specified in Tables IWX-2500-1 of the Code. Class 1, 2, and 3 component support examination methods comply with those specified in Table 2500-1 of Code Case N-491; integral attachment examination methods are defined in Relief Request RR-02.

A variety of examination methods are available for accomplishing examinations specifying the surface or volumetric examination method. The specific method specified for examination of VCSNS components was determined based on a variety of VCSNS-specific factors, such as:

- component design,
- component material specification,
- component physical access
- ALARA considerations.

2.7.1.1

Visual Examination

Visual examination types specified for use in this ISE Program are VT-1, VT-2, and VT-3. These examinations are defined in IWA-2210, and are summarized below:

- VT-1 visual examinations will be conducted on designated VCSNS components to determine the condition of the part, component, or surface examined. Such conditions include cracks, wear, corrosion, erosion, or physical damage on the surfaces of the parts or components. VT-1 visual examinations will be performed either by direct or remote visual examination techniques, per IWA-2211.

- VT-2 visual examinations will be conducted on designated VCSNS components to locate evidence of leakage from pressure retaining components, or abnormal leakage from components with or without leakage collection systems, as required during the conduct of system pressure testing. VT-2 visual examinations will be conducted in accordance with IWA-5240 and IWA-5242.
- VT-3 visual examinations will be conducted on designated VCSNS components to determine the general mechanical and structural condition of the components and component supports, including aspects such as:
 - the verification of clearances/settings,
 - physical displacements,
 - loose or missing parts,
 - debris,
 - corrosion,
 - wear,
 - erosion, or
 - the loss of integrity at bolted or welded connections.

The VT-3 visual examinations will also include examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring-type supports. This examination was formerly designated as VT-4 in the VCSNS first 10-year interval program. The VT-3 visual examination specified herein includes both the VT-3 and VT-4 visual examination techniques performed during the first interval as referenced in the 77/S78 ASME Section XI Code.

2.7.1.2

Surface Examination

Surface examinations will be performed on designated VCSNS components to detect the presence of surface cracks or discontinuities. Surface examination techniques specified for use in this ISE Program are either magnetic particle (MT) or liquid penetrant (PT), depending on surface conditions, material specification, and component accessibility.

Magnetic particle examinations will be conducted in accordance with the NDE requirements of Article 7 of ASME Section V (Reference 1.3.2.1.1). Liquid penetrant examinations will be conducted in accordance with the NDE requirements of Article 6 of ASME Section V.

2.7.1.3

Volumetric Examination

Volumetric examinations will be performed on designated VCSNS components to detect the presence of discontinuities throughout the required volume of the component material. Volumetric examination techniques available for use in this ISE Program are either radiographic (RT), or ultrasonic (UT). Ultrasonic examination techniques are the preferred volumetric examination techniques for VCSNS components. Radiographic examination techniques are not specified for volumetric examination of any VCSNS components scheduled per this ISE Program; however, radiography is a permissible volumetric examination technique and may be considered, as needed.

Radiographic examinations shall be conducted in accordance with the NDE requirements of Article 2 of ASME Section V (Reference). Ultrasonic examinations will be conducted in accordance with the NDE requirements of Mandatory Appendix I of the Code.

2.7.1.4

Alternative Examination Methods

In accordance with IWA-2240, alternative examination methods, a combination of examination methods, or newly developed examination techniques may be substituted for the methods specified in the Code, provided the ANII is satisfied that the results have been demonstrated to be equivalent or superior to those of the Code specified method. An example of an alternative method would be the use of acoustic emission. An example of an alternative technique would be the performance of high temperature liquid penetrant examination.

2.7.2

Extent of Examination

Extent of examination refers to the boundaries within which the examination requirements of the Code are to be applied, such as the number and type of components selected for examination, and including the surfaces, areas, or volumes, within the selected components where the specified examination methods are to be directed. The extent of examination of VCSNS Class 1, 2, and 3 components have been established in accordance with Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1 (pressure testing only) of the Code; Table 2500-1 of Code Case N491, establishes the extent of examination for Class 1, 2, and 3 component supports. Relief Request RR-02 provides extent of examination for Class 1, 2, and 3 integral attachments.

2.7.2.1

Selection of Components For Examination

All VCSNS components within the scope of this ISE Program are subject to Code requirements; however, the Code employs specific "selection criteria", such that for many Code Examination Categories and Items, only those components which meet this criteria are required to be examined in accordance with Code rules.

The specific criteria utilized in selection of VCSNS components for examination during the second inservice inspection interval is addressed in Sections 5.0, 6.0, and 7.0 of this ISE Program. A quantitative summary of selected components is also provided in these sections. Note, however, that the selections provided represent the initial component selections for the second 10-year inspection interval. Throughout the interval, changes in plant configuration resulting from plant repairs, replacements, or modifications, and revisions to the ISE Program, may require revision of these selections to ensure continued conformance to Code requirements.

Unless otherwise stated, the selections provided represent the minimum number of component selections necessary to satisfy the Code requirements.

2.7.2.2 Multiple-Component Concept

Multiple components, as defined in this ISE Program, refers to a grouping of like components based on similarities in design parameters, and/or function within their respective system. The "multiple-component concept" is used frequently in the selection of nonpiping components in a variety of Code Examination Categories. Basically, for a multiple-component group (i.e., multiple nonpiping components, such as valves, pumps, heat exchangers, etc.), the Code allows for selection of only one component from the group of these multiple components for examination.

Where the multiple-component concept is applied for selections of VCSNS components, it is so noted under the appropriate Code Examination Category/Item Number in Sections 5.0, 6.0, and 7.0 of this ISE Program. Appendix B contains a complete identification and listing of all VCSNS multiple-component groups.

2.7.2.3 Examination Requirements Figures

The required surfaces, areas, or volumes, within the selected VCSNS components and supports, where the specified NDE methods are to be directed are illustrated by the Examination Requirements Figures IWB-2500-1 through 18, IWC-2500-1 through 13, IWD-2500-1, and IWF-1300-1, as referenced in Tables IWB-2500-1, IWC-2500-1, IWD-2500-1 (Relief Request RR-02), and IWF-2500-1 respectively. These figures will be utilized to determine whether adequate examination coverage has been obtained.

Surfaces, areas, or volumes of which 100% of the required surfaces, areas, or volumes cannot be completely examined in accordance with the Examination Requirements Figures will be dispositioned by one of the following:

- alternative examination methods/techniques,
- alternative component selections,

- acceptance of reduced examination coverage in accordance with Code Case N-460, and/or
- preparation of a relief request to justify acceptance of the reduction in coverage.

2.7.2.3.1

ASME Code Case N-460

Reduced examination coverage of VCSNS Class 1 and 2 welds will be evaluated in accordance with ASME Code Case N-460, adopted by this ISE Program (See 4.0). In accordance with Code Case N-460, reduced examination coverage of Class 1 and 2 welds due to interference by another component or geometry of the part may be accepted, provided the reduction in coverage is less than 10%. VCSNS Class 1 and 2 weld examinations in which the examination coverage exceeds 90% of the required surfaces, areas, or volumes will be considered "essentially complete".

2.8

EXAMINATION EVALUATION

Flaws detected during ISE examinations or preservice examinations of VCSNS Class 1, 2, and 3, components and component supports will be characterized and evaluated in accordance with the standards for examination evaluation in Article IWA-3000 of the Code.

Evaluation of flaws will include comparison of the examination results with:

- the recorded results of preservice examinations (if any) and prior inservice examinations (if any), and
- the applicable Code examination acceptance standards (See).

Verified changes of known flaws from prior examinations shall be recorded in accordance with the Code.

VCSNS Class 1, 2, and 3 component examination results, with flaws which exceed the specified acceptance standards, may be evaluated as acceptable for continued service by analytical evaluation. Analytical evaluation of flaws will be conducted in accordance with IWB-3600, IWC-3600, or IWD-3000. Also, in accordance with Code Case N-491, component supports which do not meet acceptance standards may also be analyzed to substantiate the supports' integrity for its intended service.

2.9

EXAMINATION ACCEPTANCE STANDARDS

Examinations performed on VCSNS components will be evaluated by comparison of the examination results with examination acceptance standards, typically provided in the Code Articles IWX-3000. Acceptance standards to be utilized are as referenced in Tables IWX-2500-1 for Class 1, 2, and 3 components; component support acceptance standards are as referenced in Table 2500-1 from Code Case N-491 and integral attachment acceptance standards are as referenced in Relief Request RR-02.

Where acceptance standards for a particular component are not available in the Code, flaws detected may be evaluated in accordance with acceptance standards applicable to the construction of the component, such as ASME Section III or the component design specifications. Flaw disposition in this manner will be fully documented and is subject to review by jurisdictional regulatory and enforcement authorities.

VCSNS Class 1, 2, and 3 components whose examinations reveal flaw indications which exceed the specified acceptance standards or exhibit unacceptable conditions shall be unacceptable for continued service until the unacceptable condition is rectified in accordance with the Code.

2.10

ISE DRAWINGS

The ISE drawings are a collection of VCSNS plant-specific drawings designed to facilitate implementation and documentation of this ISE Program. The ISE drawings consist of the:

- ISE Classification and Boundary Identification drawings, (Piping System Flow Diagrams depicting nonexempt ISE boundaries)
- ISE Composite (Isometric) Sketches, (weld maps and component sketches)

The ISE drawings, intended solely for inservice examination, have been prepared from the VCSNS plant design drawings, and are controlled and maintained as ISE records.

Tables listing the drawings applicable to the ISE Program are found in Appendix C.

2.10.1

ISE Classification and Boundary Identification Drawings

The systems or portions of systems subject to the examination of the ISE Program for VCSNS and the associated Class 1, 2, and 3 boundaries are documented on Piping System Flow Diagrams - the ISE Classification Boundary Drawings. These drawings graphically:

- establish the VCSNS boundaries within which the ASME Section XI rules are applied;
- define the ISE classification (Class 1, 2, or 3 equivalent to 1, 2a, 2b) assigned to systems/components within the ISE boundaries; and
- illustrate specific systems/components within the ISE boundaries which are exempt from certain Section XI requirements via Code-allowed exemptions.

2.10.2

ISE Composite (Isometric) Sketches

The ISE Composite Sketches are drawings prepared from the VCSNS plant design drawings to locate, and uniquely identify, all Class 1 and 2 non-exempt welds, and equipment within the scope of the ISE Program boundaries.

The weld identification composite sketches, modeled similar to the VCSNS piping fabrication isometrics, illustrate the location of all nonexempt circumferential and longitudinal butt welds, socket welds, branch connection welds, and Class 1 and 2 integrally welded attachments associated with supports, within the scope of the ISE Program. Unique ISE identification numbers for each weld on the drawing are also provided. The weld identification numbers are utilized for documentation of Code nondestructive examinations, and also, provide traceability to records of previous nondestructive examinations of the welds, both PSI/ISE and during plant construction.

The component detail composite sketches illustrate all nonexempt welds, bolting, and integral attachments on Class 1 and 2 VCSNS plant equipment (e.g. RPV, heat exchangers, pumps, etc.) within the scope of the ISE Program. These drawings have been compiled from the equipment supplier's design drawings and records. As with the weld identification composite sketches, all ISE components are located and uniquely identified.

2.11

RECORDS AND REPORTS

2.11.1

ISE Database

In order to control the monumental task of managing the data necessary to define and implement the VCSNS ISE Program, a computer database is utilized. The database is maintained as a listing of all nonexempt components within the ISE Program scope, including the related Code requirements pertinent to each of the components. Moreover, the ISE database is used to schedule and track nondestructive examinations.

The ISE database is a controlled access database and is maintained as-built for components within the ISE boundaries.

2.11.2

Inservice Inspection Outage Summary Report

Following the completion of an inservice inspection conducted during a VCSNS plant refueling and inspection outage, SCE&G will prepare the "Inservice Inspection Summary Report" in accordance with the applicable requirements of Article IWA-6000. Note however, in addition to the Code requirements, the scope of the subject report may be optionally expanded by SCE&G to provide a more comprehensive outage report, including such areas as:

- Class 3 component examinations
- Augmented inservice inspections
- Technical Specification snubber functional testing

As such, the VCSNS "Inservice Inspection Summary Report" will, typically, address the following:

- Piping and components examinations
- Reactor pressure vessel examinations
- System pressure tests
- Snubber functional tests
- Snubber visual examinations
- ASME repairs and replacements, including Form NIS-2

The "Inservice Inspection Summary Report" will be submitted along with Form NIS-1, "Owners Report for Inservice Inspections", found in Mandatory Appendix II of the Code and Form(s) NIS-2 if any repairs or replacements have been performed.

The "Inservice Inspection Summary Report" will be submitted within 90 days of completion of the inservice examination conducted during a VCSNS plant refueling outage, and will include all examinations, tests, repairs, and replacements performed since the preceding summary report.

3.0 EXEMPTIONS AND POSITION STATEMENTS

3.1 CODE ALLOWED EXEMPTIONS

The Code rules and requirements allow certain Class 1, 2, and 3 components or portions of components (and/or their component supports), which meet certain conditions specified in the Code, to be exempt from certain examination requirements of the Code. The specific Code exemptions which have been applied to this ISE Program are detailed below.

3.1.1 Class 1 (IWB) Exemptions

Class 1 exemptions are taken directly from the Code, Paragraph IWB-1220. VCSNS Class 1 components, within the scope of this ISE Program, and which meet the following conditions, have been exempted from the volumetric and surface examination requirements of Subarticle IWB-2500:

3.1.1.1 Piping of NPS 1 and smaller, along with components and their connections in piping of NPS 1 and smaller.

3.1.1.2 Reactor vessel head connections and associated piping, NPS 2 and smaller, made inaccessible by control rod drive penetrations.

3.1.2 Class 2 (IWC) Exemptions

Class 2 exemptions are taken directly from the Code, paragraphs IWC-1220, IWC-1221, IWC-1222, and IWC-1230.

VCSNS Class 2 components, within the scope of this ISE Program, and which meet the following conditions, have been exempted from the volumetric and surface examination requirements of Subarticle IWC-2500:

- 3.1.2.1 Components within VCSNS Residual Heat Removal (RHR), Emergency Core Cooling (ECC), and Containment Heat Removal (CHR) Systems
- Vessels, piping, pumps, valves, and other components NPS 4 and smaller in all systems except High-Pressure Safety Injection Systems.

- Vessels, piping, pumps, valves, and other components NPS 1-1/2 and smaller in High-Pressure Safety Injection Systems.
- Component connections NPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves, and other components of any size in all systems except High-Pressure Safety Injection Systems.
- Component connections NPS 1-1/2 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves, and other components of any size in High-Pressure Safety Injection Systems.
- Vessels, piping, pumps, valves, other components, and component connections of any size in statically pressurized, passive (i.e., no pumps) Safety Injection Systems.
- Piping and other components of any size beyond the last shutoff valve in open-ended portions of systems that do not contain water during normal plant operating conditions.

3.1.2.2

Components within VCSNS Systems (or Portions of Systems) other than RHR, ECC, and CHR Systems

- Vessels, piping, pumps, valves, and other components NPS 4 and smaller,
- Component connections NPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves, and other components of any size.

- Vessels, piping, pumps, valves, other components, and component connections of any size in systems or portions of systems that operate (when the system function is required) at a pressure equal to or less than 275 psig and at a temperature equal to or less than 200°F.
- Piping and other components of any size beyond the last shutoff valve in open-ended portions of systems that do not contain water during normal plant operating conditions.

3.1.2.3 VCSNS piping support members and piping support components (in all Class 2 systems within the scope of this ISE Program) that are encased in concrete shall also be considered exempt (Refer also to Paragraph 3.2.1.4).

3.1.3 Class 3 (IWD) Exemptions

The only exemptions associated with Class 3 systems are contained in section 3.1.5.2.

3.1.4 Class 1, 2, and 3 Component Support Exemptions

In accordance with Code Case N-491, component supports (piping and non-piping) connected to VCSNS Class 1, 2, and 3 components that are exempted from examination in accordance with IWB-1220, IWC-1220, and IWD-1220 shall be considered exempt from the requirements of -2500 of Code Case N-491. In addition, portions of supports that are inaccessible by being encased in concrete, buried underground, or encapsulated by guard pipe, are also exempt from the examination requirements of -2000 of Code Case N-491.

3.1.5 Class 1, 2, and 3 Integral Attachments Exemptions

VCSNS integral attachments to Class 1 and 2 components within the scope of this ISE Program, are subject to the alternative examination requirements, including the exemption criteria, found in Relief Request RR-02.

3.1.5.1 Integral attachments of Class 1 and 2 components, exempted in accordance with IWB-1220 and IWC-1220, shall be considered exempt from the alternative examination requirements of Relief Request RR-02.

3.1.5.2 Class 3 integral attachment exemptions are taken directly from the Code, Paragraph IWD-1220. VCSNS Class 3 integral attachments within the scope of this ISE Program, and which meet the following conditions, have been exempted from the alternative examination requirements of Relief Request RR-02:

- VCSNS Class 3 integral attachments of supports and restraints to components that are NPS 4 and smaller within the system boundaries of Examination Categories D-A, D-B and D-C of Table IWD-2500-1, except for Auxiliary (Emergency) Feedwater Systems, shall be exempt from VT-3 visual examination.
- VCSNS Class 3 integral attachments of supports and restraints to components that exceed NPS 4 within the system boundaries of Examination Categories D-A, D-B and D-C of Table IWD-2500-1 shall be exempt from VT-3 visual examination provided:
 - the components are located in systems, or portions of systems, whose function is not required in support of reactor residual heat removal, containment heat removal, and emergency core cooling, and
 - the components operate at a pressure of 275 psig or less and at a temperature of 200°F or less.

3.2 SCE&G POSITION STATEMENTS AND CLARIFICATIONS

In some cases, certain Code rules and requirements, in SCE&G's opinion, are subject to interpretation and, therefore, require further clarification on their use. The following "Position Statements and Clarifications" have been included to discuss/clarify SCE&G's interpretation and intended application of the subject Code rules in this ISE Program.

3.2.1 Exemptions

3.2.1.1 **Class 2/3 Nonpiping Component Exemptions**

In addition to the Class 2 and Class 3 exemptions listed in , step 3.1.4, and above, nonpiping component size exemptions shall be based on the following: Nonpiping components having a cumulative inlet and a cumulative outlet nominal cross-sectional area, neither of which exceeds the nominal cross-sectional area of the applicable exemption size, shall be exempted from the surface and volumetric examination requirements of IWC-2500 and IWD-2500.

SCE&G's position on component exemptions is based on the clarification made by footnote 1 of IWC-1220 and IWD-1220 in the 1989 Addenda to ASME Section XI. When applying this criteria, it is assumed that it is not the intention of the Code to accumulate the cross-sectional areas of piping from different fluid systems entering a given component when each fluid system has separate pressure boundaries within that component.(e.g., heat exchanger shell and tube sides).

3.2.1.2 **Class 3 Integral Attachment Exemptions**

In addition to the Class 3 exemptions listed in above, integral attachments of supports and restraints to components that are NPS 1 and smaller for the Auxiliary (Emergency) Feedwater System, within the system boundaries of Examination Categories D-A, D-B, and D-C of Table IWD-2500-1, shall be exempt from the visual examination, VT-3. This position is based on the minimum size exemption given for Class 1 piping and components.

3.2.1.3 **Storage Tank Exemptions**

Tanks vented to the atmosphere, and their associated piping to the first isolation valve shall be defined as a "storage tank." Based on ASME Interpretation: XI-1-89-51, storage tanks will not be subject to volumetric or surface examinations. Storage tanks will be included within the scope of applicable visual exams.

3.2.2

Successive Inspections - First Interval verses Second Interval

In accordance with Paragraphs IWB-2420 and IWC-2420, the sequence of component examinations established during the first inservice inspection interval shall, to the extent practical, be repeated during the second 10-year inspection interval. As such, to facilitate conformance with Code requirements, the following guidelines will be applied when scheduling examinations for the second inservice inspection interval:

- Examinations will be scheduled for the same period, (i.e. an examination performed during the first period of the first inspection interval will be scheduled for the first period of the second inspection interval),
- The requirements of IWB-2420 and IWC-2420 may not be practical for those Examination Categories where the selection criteria has changed dramatically from the first interval to the second interval (e.g. Examination Category C-F verses C-F-1/C-F-2). All components may not be reselected thereby, making it impractical to repeat the examination sequence. In this case, scheduling will be handled on a case-by-case basis.

3.2.2.1

Reexamination of Components Initially Selected for Examination During The First Inservice Inspection Interval

In many Examination Categories throughout Table IWC-2500-1, a note stating that the components "selected for the initial examination shall be reexamined over the service lifetime of the component". This requirement is interpreted to be applicable only for those Examination Categories where the Code examination requirements of the first inservice inspection interval, which used the 77S78 Code, remained essentially unchanged in this second interval using the 1989 Code. As such, components selected for examination during the first inservice inspection interval should be reselected for examination during the second inservice inspection interval.

Examination Categories in which examination requirements, including the selection criteria, have changed significantly from the first inservice inspection interval are considered excluded from this requirement.

Note, this position also applies to Note 4 of Table 2500-1, Examination Category F-A of Code Case N-491 which states; "To the extent practical, the same supports selected for examination during the first inspection interval shall be examined during each successive inspection interval."

4.0

ASME CODE CASES

The ASME periodically publishes Code Cases to ASME Section XI. These Code Cases are issued to clarify the intent of existing Code rules, to provide alternative rules to existing Code rules, or to provide timely rules and requirements for circumstances not covered by existing Code rules. Adoption of various pertinent Code Cases allows the ISE program the advantages of these alternative rules/clarifications prior to their later integration into Code requirements.

All Code Cases intended to be used during the inservice inspection interval must be identified in the ISE program and are subject to acceptance by the jurisdictional regulatory and enforcement authorities.

The Code Cases applicable to the 1989 Code Edition to be used during the VCSNS second 10-year inspection interval are identified in the following section.

4.1

CODE CASES ENDORSED BY USNRC REGULATORY GUIDE 1.147, REVISION 10

USNRC Regulatory Guide 1.147 periodically provides an updated listing of the ASME Section XI Code Cases that are generally acceptable to the NRC for implementation in the ISE program. The Code Cases adopted by this ISE Program which have been endorsed by USNRC Regulatory Guide 1.147, Revision 10, are listed as follows:

- 4.1.1 N-307-1, Revised Ultrasonic Examination Volume for Class 1 Bolting, Table IWB-2500-1, Examination Category B-G-1, When the Examinations Are Conducted From the Center Drilled Hole.
- 4.1.2 N-457, Qualification Specimen Notch Location for Ultrasonic Examination of Bolts and Studs
- 4.1.3 N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds

- 4.1.4 N-461, Alternative Rules for Piping Calibration Block Thickness
- 4.1.5 N-491, Alternative Rules for Examination of Class 1, 2, 3, and MC
Component Supports of Light-Water Cooled Power Plants, Section XI,
Division 1
- 4.2 **CODE CASES NOT ENDORSED BY USNRC REGULATORY GUIDE
1.147, REVISION 10**
- 4.2.1 N-509, Alternative Rules for the Selection and Examination of Class 1, 2,
and 3 Integrally Welded Attachments, Section XI, Division 1

Note: Approval for use of this Code Case is addressed in Relief Request
RR-02.

5.0

ISE PROGRAM - WELDS AND COMPONENTS

This section herein summarizes the Code requirements applicable to VCSNS Class 1, 2, and 3 welds and components. Code Examination Categories and/or Item Numbers not applicable to VCSNS have been intentionally excluded.

NOTE:Where the Code only specifies a general examination method (i.e., surface or volumetric), SCE&G has identified a specific NDE method expected to be utilized, based on the type of material and examinations performed during the first interval. Although unlikely, the specific NDE method used may be changed during the inspection interval, as allowed by the Code.

5.1

CLASS 1 COMPONENTS

5.1.1

Examination Category B-A, Pressure-Retaining Welds in Reactor Vessel

5.1.1.1

Shell Welds, Item Numbers B1.11, and B1.12

In accordance with Table IWB-2500-1, Examination Category B-A, essentially 100% of the weld length of all VCSNS circumferential and longitudinal reactor vessel shell welds will be volumetrically (UT) examined during the second 10-year inspection interval.

5.1.1.2

Head Welds, Item Numbers B1.21, and B1.22

In accordance with Table IWB-2500-1, Examination Category B-A, the accessible length (essentially 100% of the weld length) of all VCSNS reactor vessel circumferential and meridional head welds will be volumetrically (UT) examined during the second 10-year inspection interval. While the Code permits these examinations to be deferred to the end of the interval, individual weld examinations will be scheduled to parallel the sequence of examinations established during the first interval, where practical.

5.1.1.3

Shell-to-Flange Weld, Item Number B1.30

In accordance with Table IWB-2500-1, Examination Category B-A, essentially 100% of the weld length of the VCSNS reactor vessel shell-to-flange welds will be volumetrically (UT) examined during the second 10-year inspection interval. The required examinations are to be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B, however, the alternative scheduling requirements of Table IWB-2500-1, Notes 3 and 4, may be utilized to partially defer this examination to the end of the inspection interval. Where practical, this examination will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.1.4

Head-to-Flange Weld, Item Number B1.40

In accordance with Table IWB-2500-1, Examination Category B-A, essentially 100% of the weld length of the VCSNS reactor vessel head-to-flange weld will be volumetrically (UT) and surface (MT) examined during the second 10-year inspection interval. The required examinations are to be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B, however, the alternative scheduling requirements of Table IWB-2500-1, Note 3, may be utilized to partially defer this examination to the end of the inspection interval. Where practical, this examination will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.1.5

Examination Category B-A Summary

Item Number		Number of Components	Number of Components Selected for Examination	Remarks
B1.10 Shell Welds	B1.11 Circumferential	3	3	Examine at end of interval
	B1.12 Longitudinal	6	6	Examine at end of interval
B1.20 Head Welds	B1.21 Circumferential	1	1	Examine at end of interval
	B1.22 Meridional	6	6	Examine at end of interval
B1.30 Shell-to-Flange Weld		1	1	Partial deferral allowed per notes 3 of IWB-2500
B1.40 Head-to-flange Weld		1	1	Partial deferral allowed per notes 3 of IWB-2500

5.1.2 Examination Category B-B, Pressure Retaining Welds in Vessels Other Than Reactor Vessels

5.1.2.1 Pressurizer Shell-to-Head Welds, Item Numbers B2.11, and B2.12

In accordance with Table IWB-2500-1, Examination Category B-B, essentially 100% of all VCSNS circumferential shell-to-head welds, and one foot of one longitudinal weld per head (intersecting the circumferential weld) will be volumetrically (UT) examined during the second 10-year inspection interval. The required examinations will be performed in accordance with the scheduling requirements of paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.2.2 Steam Generator Tubesheet-to-Head Welds, Item Number B2.40

In accordance with Table IWB-2500-1, Examination Category B-B, essentially 100% of one VCSNS tubesheet-to-head weld of one of the three steam generators (multiple-component concept) will be volumetrically (UT) examined during the second 10-year inspection interval. The required examinations will be performed in accordance with the scheduling requirements of paragraph IWB-2412, Inspection Program B.

5.1.2.3 Examination Category B-B Summary

Item Number	Number of Components	Number of Components Selected for Examination	Remarks
Item Number B2.11 Pressurizer Shell-to-Head Welds	2	2	
Item Number B2.12 Pressurizer Longitudinal Welds	3	2	
Item Number B2.40 S/G Tubesheet-to-Head Welds	3	1	

5.1.3 Examination Category B-D, Full-Penetration Welds of Nozzles in Vessels - Inspection Program B

5.1.3.1 Reactor Vessel Nozzle-to-Vessel Welds, Item Number B3.90

In accordance with Table IWB-2500-1, Examination Category B-D, all VCSNS reactor vessel full penetration nozzle-to-vessel welds will be volumetrically (UT) examined during the second 10-year inspection interval. Relief Request 1-RPV-1 was approved in the first interval by the NRC. This Relief Request allows the reactor vessel nozzle examinations required by categories B-D, B-F and B-J to be deferred to the end of the second interval and all subsequent intervals. Therefore, 100% of item B 3.90 welds will be completed at or near the end of the interval. A portion of the required examination volume for these welds may be deferred to the end of the inspection interval, in accordance with the requirements of Table IWB-2500-1, Note 3. Individual weld examinations, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.3.2 Reactor Vessel Nozzle Inside Radius Section, Item Number B3.100

In accordance with Table IWB-2500-1, Examination Category B-D, all VCSNS reactor vessel nozzle inside radius sections (of nozzles to be examined per Item B3.90 above) will be volumetrically (UT) examined during the second 10-year inspection interval. The required examinations will be scheduled to be completed coincident with the examinations of Item B3.90 above.

5.1.3.3 Pressurizer Nozzle-to-Vessel Welds, Item Number B3.110

In accordance with Table IWB-2500-1, Examination Category B-D, all VCSNS pressurizer full penetration nozzle-to-vessel welds will be volumetrically (UT) examined during the second 10-year inspection interval. The required examinations will be completed such that at least 25%, but not more than 50% of the nozzles will be examined by the end of the first inspection period. The remaining examinations will be completed by the end of the interval. Individual weld examinations, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.3.4 **Pressurizer and Steam Generator Nozzle Inside Radius Section, Item Numbers B3.120, and B3.140**

In accordance with Table IWB-2500-1, Examination Category B-D, all VCSNS pressurizer and steam generator nozzle inside radius sections will be volumetrically (UT) examined during the second 10-year inspection interval. The required examinations will be completed such that at least 25%, but not more than 50% of the nozzles will be examined by the end of the first inspection period, and will typically be completed coincident with the examinations of Item B3.110 above. Similarly, the remaining examinations will be completed by the end of the interval. Note: The steam generators have integrally cast nozzles and, therefore, no nozzle to vessel welds (Item B3.130).

5.1.3.5 **Examination Category B-D Summary**

Item Number	Number of Components	Number of Components Selected for Examination	Remarks
Item Number B3.90 Rector Vessel Nozzle-to-Vessel Welds	6	6	Deferral to end of interval is allowed per first interval Relief Request 1-RPV-1.
Item Number B3.100 Rector Vessel Nozzle Inside Radius Section	6	6	Examination to be conducted in conjunction with item B3.90
Item Number B3.110 Pressurizer Nozzle-to-Vessel Welds	6	6	
Item Number B3.120 Pressurizer Nozzle Inside Radius Section	6	6	
Item Number B3.140 S/G Nozzle Inside Radius Section	6	6	

5.1.4 Examination Category B-F, Pressure Retaining Dissimilar Metal Welds

5.1.4.1 Reactor Vessel Nozzle-to-Safe End Butt Welds - NPS 4 or Larger, Item Number B5.10

In accordance with Table IWB-2500-1, Examination Category B-F, all VCSNS reactor vessel nozzle-to-safe end dissimilar metal welds - NPS 4 or larger - will be volumetrically (UT) and surface (PT) examined during the second 10-year inspection interval. In accordance with Table IWB-2500-1, Note 2, the required examinations may be performed coincident with the vessel nozzle examinations of Examination Category B-D, Item B3.90 (Reference 5.1.3.1).

5.1.4.2 Pressurizer & Steam Generator Nozzle-To-Safe End Butt Welds - NPS 4 or Larger, Item Number B5.40 and B5.70

In accordance with Table IWB-2500-1, Examination Category B-F, all VCSNS pressurizer and steam generator nozzle-to-safe end dissimilar metal welds - NPS 4 or larger - will be volumetrically (UT) and surface (PT) examined during the second 10-year inspection interval. The required examinations will be performed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.4.3 Examination Category B-F Summary

Item Number	Number of Components	Number of Components Selected for Examination	Remarks
B5.10 Reactor Vessel Nozzle-to-Safe End Butt Welds NPS 4 or Larger	6	6	May be performed coincident with B-D, B3.90 examinations
B5.40 Pressurizer Nozzle-to-Safe End Dissimilar Metal Butt Welds NPS 4 or Larger	6	6	
B5.70 S/G Nozzle-to-Safe End Dissimilar Metal Butt Welds NPS 4 or Larger	6	6	

5.1.5 Examination Category B-G-1, Pressure Retaining Bolting, Greater Than 2 in. In Diameter

5.1.5.1 Reactor Vessel Closure Head Nuts, Item Number B6.10

In accordance with Table IWB-2500-1, Examination Category B-G-1, all VCSNS reactor vessel closure head nuts will receive a surface (MT) examination during the second 10-year inspection interval. The required examinations will be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B, and where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.5.2 Reactor Vessel Closure Studs in Place, Item Number B6.20

In accordance with Table IWB-2500-1, Examination Category B-G-1, reactor vessel studs may be examined either in place (under tension), when the connection is disassembled, or when the studs are removed. All VCSNS reactor vessel studs will be examined during the second 10-year inspection interval. When the stud(s) are to be examined in place, a volumetric (UT) examination will be performed. Examination of reactor vessel studs, in place, will be scheduled in accordance with the Paragraph IWB-2412, Inspection Program B, however, if the studs are removed they will be examined per the requirements of item B6.30.

5.1.5.3 Reactor Vessel Closure Studs When Removed, Item Number B6.30

In accordance with Table IWB-2500-1, Examination Category B-G-1, reactor vessel studs shall be examined when the studs are removed during the second 10-year inspection interval. All VCSNS reactor vessel studs will be examined. Both volumetric (UT) and surface (MT) examinations will be performed.

5.1.5.4 Reactor Vessel Threads in Flange, Item Number B6.40

In accordance with Table IWB-2500-1, Examination Category B-G-1, the threads in VCSNS reactor vessel flange stud holes are to be examined volumetrically (UT) during the second 10-year inspection interval. The required examinations will be completed only in the event the connections are disassembled.

5.1.5.5 **Reactor Vessel Closure Washers and Bushings, Item Number B6.50**

In accordance with Table IWB-2500-1, Examination Category B-G-1, the VCSNS reactor vessel stud closure washers and bushings will be visually (VT-1) examined during the second 10-year inspection interval. These examinations are to be accomplished in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval. The required examinations of bushings will be accomplished only in the event the connections are disassembled.

5.1.5.6 **Pump Bolts and Studs Greater Than 2 in. In Diameter, Item Number B6.180**

In accordance with Table IWB-2500-1, Examination Category B-G-1, VCSNS pump bolts/studs will be volumetrically (UT) examined during the second 10-year inspection interval. The Reactor Coolant Pumps are the only pumps applicable to Item B6.180. Per Note 3 (Table IWB-2500-1), "For ... pumps, ... examinations are limited to components selected for examination under Examination Categories ... B-L-2," Referring to Examination Category B-L-2, Pump Casings, the multiple-component concept applies, and examinations are limited to one pump per multiple-component group (i.e., one Reactor Coolant Pump). See Appendix B for multiple-component group listings.

The required examinations may be performed with the bolting in place (under tension), when the connection is disassembled, or when the bolting is removed. Bolting examinations are to be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B and, where practical, examinations will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.5.7 **Pump Flange Surfaces, Item Number B6.190**

In accordance with Table IWB-2500-1, Examination Category B-G-1, VCSNS pump flange surfaces (1 in. annular surface of flange surrounding each stud) will be visually (VT-1) examined only if the flange connection is disassembled. The Reactor Coolant Pumps are the only pumps applicable to Item B6.190. Per Note 3 of Table IWB-2500-1 (which refers to Category B-L-2 concerning multiple components selected for examination), the required examinations will be limited to one Reactor Coolant Pump.

5.1.5.8

Pump Nuts, Bushings, and Washers, Item Number B6.200

In accordance with Table IWB-2500-1, Examination Category B-G-1, VCSNS pump nuts, bushings, and washers will be visually (VT-1) examined during the second 10-year inspection interval. The Reactor Coolant Pumps are the only pumps applicable to Item B6.200 and, as with Items B6.180 and B6.190, the multiple-component concept applies and examinations will be limited to one Reactor Coolant Pump schedule per B-L-2.

5.1.5.9

Examination Category B-G-1 Summary

Item Number	Number of Components	Number of Components Selected for Examination	Remarks
B6.10 Reactor Vessel Closure Head Nuts	58	58	
B6.20 Reactor Vessel Closure Studs, in place	58	58	
B6.30 Reactor Vessel Closure Studs, when removed	58	58	Examine only if stud is removed
B6.40 Reactor Vessel Closure Threads in Flange	58	58	Examine only if stud is removed
B6.50 Reactor Vessel Closure Washers, Bushings	58	58	
B6.180 Pump Bolts and Studs Greater Than 2 in. in Diameter	3 sets of 24 (72)	1 set (24)	RCP-A, RCP-B, & RCP-C (24/pump)
B6.190 Pump Flange Surfaces	3	1	RCP-A, RCP-B, & RCP-C
B6.200 Pump Nuts, Bushings, and Washers	3 sets of 24 (72)	1 set (24)	RCP-A, RCP-B, & RCP-C (24/pump)

5.1.6 Examination Category B-G-2, Pressure Retaining Bolting, 2 in. And Less In Diameter

5.1.6.1 Reactor Vessel Bolts, Studs, and Nuts, Item Number B7.10

In accordance with Table IWB-2500-1, Examination Category B-G-2, all VCSNS reactor vessel bolts, studs, and nuts, 2 inches and under, will be visually (VT-1) examined during the second 10-year inspection interval. The required examinations may be performed with the bolting in place (under tension), when the connection is disassembled, or when the bolting is removed. Bolting examinations will be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.6.2 Pressurizer Bolts, Studs, and Nuts, Item Number B7.20

In accordance with Table IWB-2500-1, Examination Category B-G-2, all VCSNS pressurizer bolting, 2 inches and under, will be visually (VT-1) examined during the second 10-year inspection interval. The required examinations may be performed with the bolting in-place (under tension), when the connection is disassembled, or when the bolting is removed. Bolting examinations will be completed in accordance with the scheduling requirements of paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.6.3 Steam Generator Bolts, Studs, and Nuts, Item Number B7.30

In accordance with Table IWB-2500-1, Examination Category B-G-2, all VCSNS steam generator pressure retaining bolting, 2 inches and under, will be visually (VT-1) examined during the second 10-year inspection interval. The required examinations may be performed with the bolting in-place (under tension), when the connection is disassembled, or when the bolting is removed. Bolting examinations will be completed in accordance with the scheduling requirements of paragraph IWB-2412, Inspection Program B.

5.1.6.4 Piping Bolts, Studs, and Nuts, Item Number B7.50

In accordance with Table IWB-2500-1, Examination Category B-G-2, all VCSNS piping bolting (2 inches and under), on piping required to be examined in accordance with Category B-J, will be visually (VT-1) examined during the second 10-year inspection interval. The required examinations may be performed with the bolting in place (under tension), when the connection is disassembled, or when the bolting is removed. Bolting examinations will be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.6.5 Pump Bolts, Studs, and Nuts, Item Number B7.60

In accordance with Table IWB-2500-1, Examination Category B-G-2, VCSNS pump pressure retaining bolting, 2 inches and under, will be visually (VT-1) examined during the second 10-year inspection interval. The required examinations may be performed with the bolting in-place (under tension), when the connection is disassembled, or when the bolting is removed. Per Note 2 (Table IWB-2500-1), "For... pumps, examinations are limited to components selected for examination under Examination Categories...B-L-2." Referring to Examination Category B-L-2, the multiple-component concept applies, and examinations are limited to one pump in a multiple-component group, based on size, constructional design, manufacturing method, and system function. See Appendix B for multiple-component listings. Bolting examinations will be completed in accordance with the scheduling requirements of paragraph IWB-2412, Inspection Program B.

5.1.6.6 Valves Bolts, Studs, and Nuts, Item Number B7.70

In accordance with Table IWB-2500-1, Examination Category B-G-2, VCSNS valve pressure retaining bolting, 2 inches and under, will be visually (VT-1) examined during the second 10-year inspection interval. The required examinations may be performed with the bolting in place (under tension), when the connection is disassembled, or when the bolting is

removed. Per Note 2 (Table IWB-2500-1) valve bolting "examinations are limited to components selected for examination under Examination Categories ... B-M-2." Referring to Examination Category B-M-2, Valve Bodies, the multiple-component concept applies, and examinations are limited to one valve in a multiple-component group based on size, constructional design, manufacturing method, and system function. See Appendix B for multiple-component group listings. Bolting examinations will be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.6.7

Examination Category B-G-2 Summary

Item Number	Number of Components	Number of Components Selected for Examination	Remarks
B7.10 Rector Vessel Bolts, Studs, and Nuts	4	4	Conoseal bolting
B7.20 Pressurizer Bolts, Studs, and Nuts	1 set (16)	1 set (16)	Manway bolting - 16 bolts
B7.30 S/G Bolts, Studs, and Nuts	3 sets (96)	3 sets (96)	Manway bolting - 32 bolts per S/G: (Each set of 32 consists of 2 manways per S/G - 16 bolts each).
B7.50 Piping bolts, Studs, and Nuts	6 sets	6 sets	
B7.60 Pumps Bolts, Studs, and Nuts	6 sets (96)	2 sets (24)	RCP seal housing bolting (2 seals per pump, 12 bolts per seal).
B7.70 valves Bolts, Studs, and Nuts	21 sets	5 sets	Examine one set for each valve group: (VL-02, 03, 04, 05, and 06).

5.1.7 Examination Category B-H, Integral Attachments for Vessels (See Relief Request RR-02)

5.1.7.1 Pressurizer Integrally Welded Attachments, Item Number B8.20

See 7.0, Inservice Examination Program - Integral Attachments; Examination Category B-K

5.1.8 Examination Category B-J, Pressure Retaining Welds In Piping

In accordance with Table IWB-2500-1, Examination Catagory B-J, essentially 100% of the weld length of a selected sample of VCSNS Class 1 non- exempt circumferential (and intersecting longitudinal welds), branch connection, and socket welds will be volumetrically (UT) and/or surface (PT) examined during the second 10-year inspection interval. The sample selection of these welds will be in accordance with Note 1 of table IWB-2500-1, Catagory B-J which is summarized as follows:

- All terminal ends in each pipe or branch run connected to vessels.
- All terminal ends and joints in each pipe or branch run connected to other components where stress levels exceed the following limits under loads associated with specific seismic events and operational conditions:
 1. Primary plus secondary stress intensity of 2.45m for ferritic and austenitic steel, or
 2. Cumulative usage factor U of 0.4 (same criteria used in 1st interval, highest potential for failure)
- All Dissimilar Metal welds between:
 1. Carbon or alloy and high alloy steel, or
 2. Carbon or low alloy and high nickel alloy steels

- Additional welds as necessary to Ensure the sample contains 25% of the circumferential welds. (These additional welds may be selected from one loop as defined in the 1977 Edition)

Currently (during Cycle 8) VCSNS does not have any Class 1 dissimilar metal piping welds, however if a future modification adds any of these welds they will be included in the Category B-J sample.

The required examinations will be completed in accordance with the scheduling requirements of paragraph IWB-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.8.1

Examination Category B-J Item Number Summary

Item Number		Number of Components	Number of Components Selected for Examination	Remarks
B9.10 Piping Welds ≥ NPS 4	B9.11 Circumferential Welds	359	91	
	B9.12 Longitudinal Welds	0	N/A	
B9.20 Piping Welds < NPS 4	B9.21 Circumferential Welds	74	22	
	B9.22 Longitudinal Welds	0	N/A	
B9.30 Branch Connection Welds	B9.31 ≥ NPS 4	14	1	
	B9.32 < NPS 4	25	16	
B9.40 Socket Welds		301	211	

5.1.9 Examination Category B-K-1, Integral Attachments For Class 1
 Piping, Pumps and Valves (See Relief Request RR-02)

5.1.9.1 Piping Integrally Welded Attachments, Item Number B10.10

See 7.0, Inservice Examination Program - Integral Attachments;
 Examination Category B-K

5.1.10 Examination Category B-L-2, Pump Casings

5.1.10.1 Pump Casing, Item Number B12.20

In accordance with Table IWB-2500-1, Examination Category B-L-2, certain VCSNS Class 1 pump casing internal surfaces are required to be visually (VT-3) examined during the second 10-year inspection interval. The Reactor Coolant Pumps are the only components applicable to Item B12.20.

Examination of the internal pressure boundary surfaces will be performed to the extent practicable, and only when a pump is disassembled for maintenance or repair.

The multiple-component concept applies to Examination Category B-L-2 and, therefore, the required examination may be limited to one Reactor Coolant Pump, if disassembled and accessible for examination. See Appendix B for multiple-component group listings.

5.1.10.2 Examination Category B-L-2 Summary

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
B12.20 Pump Casing	3	1	RCP-A, B, & C

5.1.11 Examination Category B-M-2, Valve Bodies

5.1.11.1 Valve Body, Exceeding NPS 4, Item Number B12.50

In accordance with Table IWB-2500-1, Examination Category B-M-2, the internal surfaces of certain VCSNS valve bodies exceeding NPS 4 will be visually (VT-3) examined during the second 10-year inspection interval. Examinations will be performed only, in the event a valve is made accessible for examination by disassembly of the valve for maintenance or repair. Examinations will be performed to the extent practicable.

Selection of valves for examination is in accordance with Note 3 (Table IWB-2500-1), "Examinations are limited to at least one valve in each group of valves that are of the same size, constructional design, and manufacturing method, and that perform similar functions in the system, ..." The multiple-component concept applies, and examinations are limited to one valve in each valve group. Therefore, should a valve within a multiple-component group be disassembled and become accessible for examination, the completed examination will satisfy the Examination Category B-M-2 examination requirements for that group for the second 10-year inspection interval. See Appendix B for multiple-component group listings.

5.1.11.2 Examination Category B-M-2 Summary

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
B12.50 Valve Body, Exceeding NPS 4	24	6	Valve Groups VL-01 thru VL-06

5.1.12 Examination Category B-N-1, Interior Of Reactor Vessel

5.1.12.1 Reactor Vessel Interior, Item Number B13.10

In accordance with Table IWB-2500-1, Examination Category B-N-1, VCSNS reactor vessel interior areas made accessible for examination by removal of components during normal refueling outages will be visually (VT-3) examined at approximately 3 year intervals during the second 10-year inspection interval.

5.1.13 **Examination Category B-N-2, Integrally Welded Core Support Structures and Interior Attachments To Reactor Vessels**

5.1.13.1 **Reactor Vessel (PWR) Interior Attachments Beyond Beltline Region, Item Number B13.60**

In accordance with Table IWB-2500-1, Examination Category B-N-2, all accessible VCSNS reactor vessel interior attachments outside of the beltline region will be visually (VT-3) examined during the second 10-year inspection interval. The Code permits these examinations to be deferred to the end of the interval. Where practical, however, individual weld examinations will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.14 **Examination Category B-N-3, Removable Core Support Structures**

5.1.14.1 **Core Support Structure, Item Number B13.70**

In accordance with Table IWB-2500-1, Examination Category B-N-3, surfaces of the VCSNS removable core support structure will be visually (VT-3) examined during the second 10-year inspection interval. The Code permits this examination to be deferred to the end of the interval. Where practical, however, this examination will be scheduled to parallel the sequence of the examination established during the first interval.

5.1.15 **Examination Category B-O, Pressure Retaining Welds In Control Rod Housings**

5.1.15.1 **Reactor Vessel Welds in CRD Housing, Item Number B14.10**

In accordance with Table IWB-2500-1, Examination Category B-O, all VCSNS pressure retaining welds of 10% of the peripheral CRD housings (10% of 24 peripheral housings equals 3 housings) will be volumetrically (UT) examined during the second 10-year inspection interval. The Code permits these examinations to be deferred to the end of the interval. Where practical, however, individual weld examinations will be scheduled to parallel the sequence of examinations established during the first interval.

5.1.15.2 **Examination Category B-O Summary**

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
Item Number B14.10 Reactor Vessel Welds in CRD Housing	24	3	

5.1.16 **Examination Category B-P, All Pressure Retaining Components**

See 8.0, Inservice Examination Program - System Pressure Testing

5.1.17 **Examination Category B-Q, Steam Generator Tubing**

In accordance with Table IWB-2500-1, Examination Category B-Q, Note 1, the extent and frequency requirements for volumetric examination (ET) of the VCSNS steam generator tubing during the second 10-year inspection interval shall be in accordance with the Plant Technical Specifications.

5.2 **CLASS 2 COMPONENTS**

5.2.1 **Examination Category C-A, Pressure Retaining Welds In Pressure Vessels**

5.2.1.1 **Shell Circumferential Welds, Item Number C1.10**

In accordance with Table IWC-2500-1, Examination Category C-A, essentially 100% of the weld length of pressure retaining welds at gross structural discontinuities in VCSNS Class 2 pressure vessels will be volumetrically (UT) examined during the second 10-year inspection interval. Therefore, for the second inspection interval, the same welds examined during the first interval will be selected for examination during the second interval. Note that the multiple-component concept was applied to selection of welds during the first interval; likewise, the second interval required examinations will be limited to one vessel (or the equivalent of one vessel) in a multiple-component group. See Appendix B for multiple-component group listings. Per Note 4 (Table IWC-2500-1), the vessel areas selected for examination during the first inservice inspection interval shall be reexamined over the service lifetime of the components.

The required examinations will be performed in accordance with the scheduling requirements of paragraph IWC-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.2.1.2

Head Circumferential Welds, Item Number C1.20

In accordance with Table IWC-2500-1, Examination Category C-A, essentially 100% of the weld length of VCSNS Class 2 pressure vessel head-to-shell welds will be volumetrically (UT) examined during the second 10-year inspection interval. Therefore, for the second inspection interval, the same welds examined during the first interval will be selected for examination during the second interval. Note that the multiple-component concept was applied to selection of welds during the first interval; likewise, the second interval required examinations will be limited to one vessel (or the equivalent of one vessel) in a multiple-component group. See Appendix B for multiple-component group listings. Per Note 4 (Table IWC-2500-1), the vessel areas selected for examination during the first inservice inspection interval shall be reexamined over the service lifetime of the components.

The required examinations will be performed in accordance with the scheduling requirements of paragraph IWC-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.2.1.3

Tubesheet-to-Shell Welds, Item Number C1.30

In accordance with Table IWC-2500-1, Examination Category C-A, essentially 100% of the weld length of VCSNS Class 2 pressure vessel tubesheet-to-shell welds will be volumetrically (UT) examined during the second 10-year inspection interval. Therefore, for the second inspection interval, the same welds examined during the first interval will be selected for examination during the second interval. Note that the multiple-component concept was applied to selection of welds during the first interval; likewise, the second interval required examinations will be limited to one

vessel (or the equivalent of one vessel) in a multiple-component group. See Appendix B for multiple-component group listings. Per Note 4 (Table IWC-2500-1), the vessel areas selected for examination during the first inservice inspection interval shall be reexamined over the service lifetime of the components.

The required examinations will be performed in accordance with the scheduling requirements of paragraph IWC-2412, Inspection Program 13 and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.2.1.4 Examination Category C-A Summary

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
C1.10 Shell Circumferential Welds	17	6	SG-A/B/C (5 welds per SG) RHRHX-A/B (1 weld per HX)
C1.20 Head Circumferential Welds	5	2	SG-A/B/C (1 weld per SG) RHRHX-A/B (1 weld per HX)
C1.30 Tubesheet-to-Shell Welds	3	1	SG-A/B/C (1 weld per SG)

5.2.2 Examination Category C-B, Pressure Retaining Nozzle Welds In Vessels

In accordance with Note 2 of Table IWC-2500-1 for Category C-B, only those vessel nozzles at terminal ends of piping runs which are required to be examined per Category C-F are applicable to the requirements of Category C-B. That is, vessel nozzles at terminal ends of thinwall piping runs are not required to be examined per category C-B. However, no thin wall piping is associated with VCSNS Class 2 nozzles, therefore all of the nozzles are subject to the requirements of Category C-B.

Per Note 4 (Table IWC-2500-1), "In the case of multiple vessels of similar design, size, and service... the required examinations may be limited to one vessel or distributed among the vessels," therefore, the multiple-component concept applies. See Appendix B for multiple-component group listings.

The required examinations will be performed in accordance with the scheduling requirements of paragraph IWC-2412, Inspection Program B and, where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

5.2.2.1 Nozzle-to-Shell Weld of Nozzles Without Reinforcing Plate in Vessels > ½ in. Nominal Thickness, Item Number C2.21

In accordance with Table IWC-2500-1, Examination Category C-B, VCSNS Class 2 pressure retaining nozzle-to-shell or nozzle-to-head welds in pressure vessels will be surface (MT) and volumetrically (UT) examined during the second 10-year inspection interval.

5.2.2.2 Nozzle Inside Radius Section of Nozzles Without Reinforcing Plate in Vessels > ½ in. Nominal Thickness, Item Number C2.22

In accordance with Table IWC-2500-1, Examination Category C-B, VCSNS Class 2 nozzle inside radius sections will be volumetrically (UT) examined during the second 10-year inspection interval. This will include all nozzles at terminal ends of non-exempt piping runs.

5.2.2.3 Reinforcing Plate Welds to Nozzle and Vessel of Nozzles With Reinforcing Plate in Vessels > 1/2" Nominal Thickness, Item Number C2.31

In accordance with Table IWC-2500-1, Examination Category C-B, VCSNS reinforcing plate to nozzle and vessel welds in Class 2 pressure vessels, will be surface (PT) examined during the second 10-year inspection interval. This will include all vessel nozzles at terminal ends of nonexempt piping runs.

5.2.2.4 **Nozzle to Shell (or Head) welds when Inside of Vessel is Inaccessible for Nozzles With Reinforcing Plate in Vessels > 1/2" Nominal Thickness, Item Number C2.33**

In accordance with Table IWC-2500-1, Examination Category C-B, VCSNS nozzle to shell (or head) welds, in Class 2 pressure vessels, when the inside of the vessel is inaccessible, will be visually (VT-2) examined during system pressure test required by Examination Category C-H, each inspection period during the second 10-year inspection interval.

5.2.2.5 **Examination Category C-B Summary**

Item Number		Number of Components	Number of Components Selected for Examination	Remarks
C2.20 Nozzles Without Reinforcing Plate in Vessels > 1/2 in. Nominal Thickness	C2.21 Nozzle-to Shell Weld	9	3	SG-A/B/C: FW, AFW, & MS Nozzles
	C2.22 Nozzle inside Radius Section	6	2	S/G-A/B/C: FW, & MS Nozzles
C2.20 Nozzles With Reinforcing Plate in Vessels > 1/2 in. Nominal Thickness	C2.31 Reinforcing Plate to Nozzle and Vessel	4	2	RHRHX-A/B
	C2.33 Nozzle to shell (or head) welds when inside of vessel is inaccessible	4	2	RHRHX-A/B Note: VT-2 Examination, Controlled by SCE&G Procedure SAP-145.

5.2.3 **Examination Category C-C, Integral Attachments For Class 2 Vessels and Piping (See Relief Request RR-02)**

See 7.0, Inservice Examination Program - Integral Attachments; Examination Category C-C

5.2.4

Examination Category C-F-1, Pressure Retaining Welds In Austenitic Stainless Steel Or High Alloy Piping

Selection of Examination Category C-F-1 welds for examination will be in accordance with Note 2 of Table IWC-2500-1, as follows:

- 7.5%, but not less than 28, of all nonexempt austenitic stainless steel or high-alloy circumferential piping welds will be selected for examination.
- Welds not exempted by IWC-1220 (e.g., piping welds $>$ NPS 4 which are $< 3/8$ nominal wall, or piping welds \leq NPS 4 and \geq NPS 2 which are $\leq 1/5$ nominal wall) are not required to be nondestructively examined per Examination Category C-F-1; however, these welds are to be included in the total weld count to which the 7.5% sampling rate is applied. Note: for accountability purposes, these "thinwall" piping welds are identified by adding the suffix "-TW" to the appropriate Code item number.
- Longitudinal welds are excluded from the total to which the 7.5% sample is applied, since they are scheduled for examination in conjunction with a selected intersecting circumferential weld.
- Any Class 2 dissimilar metal welds which contains a combination of C-F-1 and C-F-2 material are included in Category C-F-1 in accordance with Code Interpretation XI-1-89-57.
- The required examinations will be distributed among the Class 2 systems prorated, to the degree practicable, on the number of circumferential welds in each system (i.e., if a system contains 30% of the nonexempt welds, then 30% of the nondestructive examinations required by Examination Category C-F-1 should be performed on that system). Longitudinal welds will only be examined when found intersecting a selected circumferential weld. However, as explained by interpretation XI-1-83-80R, if the longitudinal seam is in SA-403 material and was welded without the addition of filler material, examination is not required.

- Within a system, the required examinations will be distributed among terminal ends (TE's) and structural discontinuities (SD's) ... prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system. In the event that proration calculations indicate essentially zero TE selections, a minimum of one TE selection will be made. Refer to paragraphs 1.3.4.21, 1.3.4.22, and 3.2.3 for definitions and clarifications of terminal ends and structural discontinuities.
- Within each system, the required examinations will be distributed between lines sizes, prorated to the degree practicable.

Due to the dramatic change, from the first inspection interval to the second, in the Code rules dealing with examination of Class 2 pressure retaining welds, scheduling of second inspection interval required examinations to parallel the sequence established during the first inspection interval is not practical. Examination Category C-F-1 welds selected for examination during the second inservice inspection interval that were previously examined during the first interval will, where practical, be scheduled for the corresponding period in the second interval; however, the scheduling requirements of Paragraph IWC-2412, Inspection Program B will take precedence.

5.2.4.1 **Circumferential Piping Welds $\geq 3/8$ in. Nominal Wall Thickness for Piping > NPS 4, Item Number C5.11**

In accordance with Table IWC-2500-1, Examination Category C-F-1, VCSNS nonexempt stainless steel circumferential welds in piping greater than or equal to $3/8$ " (.375) nominal wall thickness, for piping greater than NPS 4, will be examined by both surface (PT) and volumetric (UT) methods during the second 10-year inspection interval. Selection and scheduling will be in accordance with paragraph 5.2.4 above.

5.2.4.2 **Longitudinal Piping Welds $\geq 3/8$ in. Nominal Wall Thickness for
Piping $>$ NPS 4, Item Number C5.12**

In accordance with Table IWC-2500-1, Examination Category C-F-1, VCSNS nonexempt stainless steel longitudinal welds in piping greater than or equal to $3/8$ " (.375) nominal wall thickness, for piping greater than NPS 4, will be examined by both surface (PT) and volumetric (UT) methods during the second 10-year inspection interval. Longitudinal welds will be selected and scheduled for examination based on their intersection with a selected circumferential weld, and will be examined for a distance from the intersecting weld equal to 2.5 times the nominal wall thickness.

5.2.4.3 **Circumferential Piping Welds $> 1/5$ inch Nominal Wall Thickness for
Piping \geq NPS 2 and \leq NPS 4 (High Pressure Safety Injection), Item
Number C5.21**

In accordance with Table IWC-2500-1, Examination Category C-F-1, VCSNS nonexempt stainless steel circumferential welds in piping greater than $1/5$ " (.2") nominal wall thickness, for piping greater than or equal to NPS 2 and less than or equal to NPS 4, will be surface (PT) and volumetrically (UT) examined during the second 10-year inspection interval. Selection and scheduling will be in accordance with paragraph 5.2.4 above.

5.2.4.4 **Socket Welds, Item Number C5.30**

In accordance with Table IWC-2500-1, Examination Category C-F-1, VCSNS nonexempt stainless steel socket welds will be surface (PT) examined during the second 10-year inspection interval. Selection and scheduling will be in accordance with paragraph 5.2.4 above.

5.2.45. **Circumferential Welds of Pipe Branch Connections of Branch Piping
 \geq NPS 2, Item Number C5.41**

In accordance with Table IWC-2500-1, Examination Category C-F-1, VCSNS nonexempt stainless steel circumferential branch connection welds of branch piping greater than or equal to NPS 2 will be surface (PT) examined during the second 10-year inspection interval. Selection and scheduling will be in accordance with paragraph 5.2.4 above.

5.2.4.6

Examination Category C-F-1 Item Summary

Item Number		Number of Components	Remarks
Item No. C5.11-TW Nonexempt circumferential piping welds > NPS 4, and < 3/8" nominal		567	Thinwall piping - not required to be examined
Item No. C5.12-TW Nonexempt Longitudinal piping welds > NPS 4, and < 3/8" nominal wall		401	Thinwall piping - not required to be examined
Item No. C5.21-TW Nonexempt circumferential piping welds \geq NPS 2, and \leq NPS 4, and \leq 1/5" nominal wall		0	Thinwall piping - not required to be examined
C5.10 Piping Welds \geq 3/8" Nominal Wall for Piping > NPS 4	C5.11 Circumferential Weld	380	
	C5.12 Longitudinal Weld	286	
C5.20 Piping Welds > 1/5" Nominal Wall for Piping \geq NPS 2 and \leq NPS 4	C5.21 Circumferential Weld	252	
	C5.22 Longitudinal Weld	0	
C5.30 Socket Welds		76	
C5.40 Branch Connections of Branch Piping \leq NPS 2	C5.41 Circumferential Weld	10	
	C5.42 Longitudinal Weld	0	

5.2.4.7

Examination Category C-F-1 System Summary

Total C-F-1 Circumferential Piping Welds (including Thinwall piping) = 1285 ¹ Calculated Overall C-F-1 Circumferential Weld Sample Requirement - 97 ²											
Including Thinwall Piping		Excluding Thinwall Piping Items									
System Name	overall Total Welds	Code Req'd Total Welds ³	Percent of System Total	Prorated System Sample ⁴	Total TE'S	Total SD'S	Total PP'S	TE% Of Total TE + SD	SD% Of Total TE + SD	TE% Of Total TE + SD	SD% Of Total TE + SD
CS	305	152	21.17%	21	7	139	6	4.8%	95.2%	1	20
RHR	278	99	13.79%	14	6	78	15	7.1%	92.9%	1	13
SI	455	382	53.20%	52	15	316	51	4.5%	95.5%	2	50
SP	247	85	11.84%	12	0	80	5	0.0%	100.0%	0	12
Totals	1285	718	-	99	28	613	77	-	-	4	95

Note 1: Overall system weld total includes those welds identified as Category C-F-1 thinwall piping Item Numbers (Item numbers with suffix "-TW"), and excludes longitudinal welds, in order to produce the total welds for which the overall Category sample calculation is based. Actual distribution (proration) calculations of the overall Category sample shall exclude the thinwall piping welds as well as the longitudinal welds.

Note 2: The overall system sample calculation for the Category is 7.5% of the total nonexempt population of circumferential welds, including the thinwall piping. This sample number is rounded up in the event of fractional results. In the event that this number equates to less than 28, the sample number is increased to the minimum of 28. In the event that the resulting sample number is greater than the total number of Code required welds (excludes thinwall) available to sample, the sample is lowered to equal 100% of the available Code required welds (total of column 3).

Note 3: Code required welds exclude the thinwall piping welds.

Note 4: The prorated system sample calculations are rounded up in the event of fractional results to ensure minimum sample requirements are maintained

Note 5: Final TE and SD sample calculations which result in fractional values are rounded to the nearest whole number, however, in the event that the resultant required TE sample rounds down to zero, the TE required sample will be rounded up to one, and the SD required sample will be lowered by one. Note that the pipe-to-pipe (PP, column 8) welds are not part of the required sample proration, and are only shown to provide clarity of weld totals.

5.2.4.8 Examination Category C-F-1 Summary by Line Size

System	Weld Type	Pipe Size	Total Welds	Total Selected
CS	TE-P	3	3	1
CS	TE-A	4	2	0
CS	TE-A	3	2	0
CS	SD	4	24	3
CS	SD	3	77	12
CS	SD	2	38	5
RHR	TE-P	14	2	0
RHR	TE-A	12	4	1
RHR	SD	14	27	4
RHR	SD	12	51	9
RHR	LS	14	59	10
RHR	LS	12	52	5
SI	TE-V	20	1	1
SI	TE-A	14	2	0
SI	TE-A	10	6	0
SI	TE-A	4	1	0
SI	TE-A	3	4	1
SI	TE-A	2	1	0
SI	SD	20	8	2
SI	SD	14	39	5
SI	SD	12	1	1
SI	SD	10	35	5
SI	SD	8	3	1
SI	SD	6	55	8
SI	SD	4	9	2
SI	SD	3	134	22
SI	SD	2	32	4
SI	LS	20	27	6
SI	LS	14	96	9
SP	SD	12	80	12
SP	LS	12	52	5

5.2.5

Examination Category C-F-2, Pressure Retaining Welds In Carbon Or Low Alloy Steel Piping

Selection of Examination Category C-F-2 welds for examination will be in accordance with Note 2 of Table IWC-2500-1, as follows:

- 7.5%, but not less than 28, of all nonexempt carbon steel circumferential piping welds will be selected for examination.
- Welds not exempted by IWC-1220 (e.g., piping welds > NPS 4 which are < 3/8 nominal wall, or piping welds ≤ NPS 4 and ≥ NPS 2 which are ≤ 1/5 nominal wall) are not required to be nondestructively examined per Examination Category C-F-2; however, these welds are to be included in the total weld count to which the 7.5% sampling rate is applied. Note: for accountability purposes, these "thinwall" piping welds are identified by adding the suffix "-TW" to the appropriate Code Item number.
- Longitudinal welds are excluded from the total to which the 7.5% sample is applied, since they are scheduled for examination in conjunction with a selected intersecting circumferential weld.
- Any Class 2 dissimilar metal welds which contain a combination of C-F-1 and C-F-2 material are included in Category C-F-1 in accordance with Code Interpretation XI-1-89-57.
- The required examinations will be distributed among the Class 2 systems prorated, to the degree practicable, on the number of circumferential piping welds in each system (i.e., if a system contains 30% of the nonexempt circumferential welds, then 30% of the nondestructive examinations required by Examination Category C-F-2 should be performed on that system). Longitudinal welds will only be examined when found intersecting a selected circumferential weld. However, as explained in interpretation XI-1-83-80R, if the longitudinal seam is in SA-403 material and was welded without the addition of filler material, examination is not required.
- Within a system, the required examinations will be distributed among terminal ends (TE's) and structural discontinuities (SD's) ... prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system. In the event that proration calculations indicate essentially zero TE selections, a minimum of one TE selection will be made. Refer to paragraphs 1.3.4.21, 1.3.4.22, and 3.2.3 for definitions and clarifications of terminal ends and structural discontinuities.

- Within each system, the required examinations will be distributed between line sizes, prorated to the degree practicable

Due to the dramatic change, from the first inspection interval to the second, in the Code rules dealing with examination of Class 2 pressure retaining welds, scheduling of second inspection interval required examinations to parallel the sequence established during the first inspection interval is not practical. Examination Category C-F-2 welds selected for examination during the second inservice inspection interval that were previously examined during the first interval will, where practical, be scheduled for the corresponding period in the second interval; however, the scheduling requirements of Paragraph IWC-2412, Inspection Program B, will take precedence.

5.2.5.1 Circumferential Piping Welds $\geq 3/8$ in. Nominal Wall Thickness for Piping > NPS 4, Item Number C5.51

In accordance with Table IWC-2500-1, Examination Category C-F-2, VCSNS nonexempt carbon steel circumferential welds in piping greater than or equal to $3/8$ " (.375) nominal wall thickness, for piping greater than NPS 4, will be examined by both surface (MT or PT) and volumetric (UT) methods during the second 10-year inspection interval. Selection and scheduling will be in accordance with paragraph 5.2.5 above.

5.2.5.2 Longitudinal Piping Welds $\geq 3/8$ in. Nominal Wall Thickness for Piping > NPS 4, Item Number C5.52

In accordance with Table IWC-2500-1, Examination Category C-F-2, VCSNS nonexempt carbon steel longitudinal welds in piping greater than or equal to $3/8$ " (.375) nominal wall thickness, for piping greater than NPS 4, will be examined by both surface (MT or PT) and volumetric (UT) methods during the second 10-year inspection interval. Longitudinal welds will be selected and scheduled for examination based on their intersection with a selected circumferential weld, and will be examined for a distance from the intersecting weld equal to 2.5 times the nominal wall thickness.

5.2.5.3

**Circumferential Welds of Pipe Branch Connections of Branch Piping
 \geq NPS 4, Item Number C5.81**

In accordance with Table IWC-2500-1, Examination Category C-F-2, VCSNS nonexempt carbon steel circumferential branch connection welds of branch piping greater than or equal to NPS 2 will be surface (MT or PT) examined during the second 10-year inspection interval. Selection and scheduling will be in accordance with paragraph 5.2.5 above.

5.2.5.4

Examination Category C-F-2 Item Summary

Item Number		Number of Components	Remarks
Item No. C5.51-TW Nonexempt circumferential piping welds \geq NPS 4, and $< 3/8$ " nominal wall.		0	Thinwall piping - not required to be examined
Item No. C5.61-TW Nonexempt circumferential piping welds \geq NPS 2, and \leq NPS 4, and $\leq 1/5$ " nominal wall.		0	Thinwall piping - not required to be examined
C5.50 Piping Welds $\geq 3/8$ " Nominal Wall for Piping $> \text{NPS } 4$	C5.51 Circumferential Weld	256	
	C5.52 Longitudinal Weld	182	
C5.60 Piping Welds $> 1/5$ " Nominal Wall for Piping $\geq \text{NPS } 2$ and $\leq \text{NPS } 4$	C5.61 Circumferential Weld	0	
	C5.62 Longitudinal Weld	0	
C5.70 Socket Welds		0	
C5.80 Branch Connections of Branch Piping $\leq \text{NPS } 2$	C5.81 Circumferential Weld	23	
	C5.82 Longitudinal Weld	0	

5.2.5.5 Examination Category C-F-2 System Summary

Total C-F-1 Circumferential Piping Welds (including Thinwall piping) = 1285 ¹ Calculated Overall C-F-1 Circumferential Weld Sample Requirement - 97 ²											
Including Thinwall Piping		Excluding Thinwall Piping Items									
System Name	overall Total Welds	Code Req'd Total Welds ³	Percent of System Total	Prorated System Sample ⁴	Total TE'S	Total SD'S	Total PP'S	TE% Of Total TE + SD	SD% Of Total TE + SD	TE% Of Total TE + SD	SD% Of Total TE + SD
EF	10	10	3.58%	2	2	8	0	20.0%	80.0%	1	1
FW	93	93	33.33%	10	10	72	11	12.2%	87.8%	1	9
MS	141	141	50.54%	15	12	107	22	10.1%	89.9%	2	13
SW	35	35	12.54%	4	4	30	1	11.8%	88.2%	1	3
Totals	279	279	-	31	28	217	34	-	-	5	26

Note 1: Overall system weld total includes those welds identified as Category C-F-2 thinwall piping Item Numbers (Item numbers with suffix "-TW"), and excludes longitudinal welds, in order to produce the total welds for which the overall Category sample calculation is based. Actual distribution (proration) calculations of the overall Category sample shall exclude the thinwall piping welds as well as the longitudinal welds.

Note 2: The overall system sample calculation for the Category is 7.5% of the total nonexempt population of circumferential welds, including the thinwall piping. This sample number is rounded up in the event of fractional results. In the event that this number equates to less than 28, the sample number is increased to the minimum of 28. In the event that the resulting sample number is greater than the total number of Code required welds (excludes thinwall) available to sample, the sample is lowered to equal 100% of the available Code required welds (total of column 3).

Note 3: Code required welds exclude the thinwall piping welds.

Note 4: The prorated system sample calculations are rounded up in the event of fractional results to ensure minimum sample requirements are maintained

Note 5: Final TE and SD sample calculations which result in fractional values are rounded to the nearest whole number, however, in the event that the resultant required TE sample rounds down to zero, the TE required sample will be rounded up to one, and the SD required sample will be lowered by one. Note that the pipe-to-pipe (PP, Column 8) welds are not part of the required sample proration, and are only shown to provide clarity of weld totals.

5.2.5.6 Examination Category C-F-2 Summary by Line Size

System	Weld Type	Pipe Size	Total Welds	Total Selected
EF	TE-V	6	2	1
EF	SD	6	8	1
FW	TE-V	16	3	0
FW	TE-V	6	1	1
FW	TE-A	18	6	0
FW	SD	18	65	7
FW	SD	16	3	1
FW	SD	6	4	1
FW	LS	18	10	0
FW	LS	16	2	0
MS	TE-V	32	3	1
MS	TE-B	8	3	0
MS	TE-A	32	6	1
MS	SD	33.5	6	1
MS	SD	32	53	6
MS	SD	14	15	2
MS	SD	8	18	2
MS	SD	6	15	2
MS	LS	33.5	14	1
MS	LS	32	156	16
SW	TE-A	16	4	1
SW	SD	16	24	2
SW	SD	12	6	1

5.2.6 Examination Category C-H, All Pressure Retaining Components

See 8.0, Inservice Examination Program - System Pressure Testing

5.3 CLASS 3 COMPONENTS

5.3.1 Examination Category D-A, System in Support of Reactor Shutdown Function

See 8.0, Inservice Examination Program - System Pressure Testing

See 7.0, Inservice Examination Program - Integral Attachments

5.3.2 Examination Category D-B, Systems In Support Of Emergency Core
Cooling, Containment Heat Removal, Atmosphere Cleanup, and
Reactor Residual Heat Removal

See 8.0, Inservice Examination Program - System Pressure Testing

See 7.0, Inservice Examination Program - Integral Attachments

5.3.3 Examination Category D-C, Systems In Support Of Residual Heat
Removal From Spent Fuel Storage Pool

See 8.0, Inservice Examination Program - System Pressure Testing

See 7.0, Inservice Examination Program - Integral Attachments

6.0 ISE PROGRAM - COMPONENT SUPPORTS

Inservice inspection of VCSNS Class 1, 2, and 3 component supports during the second 10-year inspection interval will be performed in accordance with Code Case N-491.

6.1 INSERVICE EXAMINATION - CLASS 1, 2, AND 3 PIPING SUPPORTS

6.1.1 Examination Category F-A, Piping Supports

6.1.1.1 Class 1 Piping Supports, Item Number F1.10

In accordance with Table -2500-1, Examination Category F-A, Code Case N-491, 25% of the total VCSNS nonexempt Class 1 piping supports, will be visually (VT-3) examined during the second 10-year inspection interval.

Selection of Examination Category F-A supports for examination will be in accordance with Note 2 of Table -2500-1, such that the total percentage sample will be comprised of supports from each system within the scope of this ISE Program, and the sample sizes within each system will be prorated by support type/function based on the total number of nonexempt supports of each type/function in that system.

To facilitate selection of supports, and in accordance with Note 1 of Table -2500-1, Item Numbers will be categorized to identify support types, as illustrated in the summary table of 6.1.1.4. The four support types utilized are Anchor, Rigid, Snubber, and Spring.

Due to the dramatic change, from the first 10-year inspection interval to the second, in the rules dealing with examination of Class 1 supports, scheduling of second inspection interval required examinations to parallel the sequence established during the first inspection interval (-2420 of Code Case N-491) may not be practical in all cases. Likewise, Note 4 of Table -2500-1 , regarding re-selection of the same supports from the first interval,

is considered not applicable. Therefore, only where practical, supports examined during the first 10-year inspection interval will be scheduled for the corresponding period in the second interval. Note, however, that other factors, such as the scheduling requirements of Table -2410-2, Inspection Program B and the presence of associated integral attachments, will take precedence.

6.1.1.2

Class 2 Piping Supports, Item Number F1.20

In accordance with Table -2500-1, Examination Category F-A, of Code Case N-491, 15% of the total VCSNS nonexempt Class 2 piping supports, will be visually (VT-3) examined during the second 10-year inspection interval.

Selection of Examination Category F-A supports for examination will be in accordance with Note 2 of Table -2500-1, such that the total percentage sample will be comprised of supports from each system within the scope of this ISE Program, and the sample sizes within each system will be prorated by support type/function based on the total number of nonexempt supports of each type/function in that system.

To facilitate selection of supports, and in accordance with Note 1 of Table -2500-1, Item Numbers will be categorized to identify support types, as illustrated in the summary table of 6.1.1.4. The four support types utilized are Anchor, Rigid, Snubber, and Spring.

Due to the dramatic change, from the first 10-year inspection interval to the second, in the rules dealing with examination of Class 2 supports, scheduling of second 10-year interval required examinations to parallel the sequence established during the first inspection interval (-2420 of Code Case 491) may not be practical in all cases. Likewise, Note 4 of Table -2500-1, regarding re-selection of the same supports from the first interval, is considered not applicable. Therefore, only where practical, supports examined during the first 10-year inspection interval will be scheduled for the corresponding period in the second interval.

Note, however, that other factors, such as the scheduling requirements of Table -2410-2, Inspection Program B and the presence of associated integral attachments, will take precedence.

6.1.1.3

Class 3 Piping Supports, Item Number F1.30

In accordance with Table -2500-1, Examination Category F-A, of Code Case N-491, 10% of the total VCSNS nonexempt Class 3 piping supports, will be visually (VT-3) examined during the second 10-year inspection interval. Selection of Examination Category F-A supports for examination will be in accordance with Note 2 of Table -2500-1, such that the total percentage sample will be comprised of supports from each system within the scope of this ISE Program, and the sample sizes within each system will be prorated by support type/function based on the total number of nonexempt supports of each type/function in that system.

To facilitate selection of supports, and in accordance with Note 1 of Table -2500-1, Item Numbers will be categorized to identify support types, as illustrated in the summary table of 6.1.1.4. The four support types utilized are Anchor, Rigid, Snubber, and Spring.

Due to the dramatic change, from the first interval to the second, in the rules dealing with examination of Class 3 supports, scheduling of second interval required examinations to parallel the sequence established during the first inspection interval (IWF-2420 of the 90 Addenda) may not be practical in all cases. Likewise, Note 4 of Table -2500-1, regarding re-selection of the same supports from the first interval, is considered not applicable.

The required examinations will be performed in accordance with the scheduling requirements of Table -2410-2, Inspection Program B.

6.1.1.4

Pipe Support Summary by Class, System, and Support Type

Required Sample For Class 1 Piping Supports = (25% * 341) = 86 Required Sample For Class 2 Piping Supports = (15% * 745) = 113 Required Sample For Class 3 piping Supports = (10% * 619) = 62 (Note 1)																	
Class	Sys	Ttl	% of Class Total	Req'd System Sample 2	Anchor			Rigid			Snubber			Spring			Final Req'd Sample 2
					Ttl	% System Total	Req'd Sample 3	Ttl	% System Total	Req'd Sample 3	Ttl	% System Total	Req'd Sample 3	Ttl	% System Total	Req'd Sample 3	
1	CS	60	17.60	16	0	0.0	0	11	18.3	3	35	58.3	9	14	23.3	4	16
1	RC	112	32.84	29	3	2.7	1	17	15.2	4	77	68.8	20	15	13.4	4	29
1	SI	169	49.56	43	2	1.2	1	64	37.9	16	86	50.9	22	17	10.1	4	43
Class 1	TtIs	341	-	88	5	-	2	92	-	23	198	-	51	46	-	12	88
2	CS	91	12.08	14	6	6.6	1	68	47.7	10	12	13.2	2	5	5.5	1	14
2	FW	39	5.18	6	3	4.2	0	19	26.8	4	40	56.3	6	9	12.7	1	11
2	MS	71	9.43	11	3	4.2	0	9	23.1	2	20	51.3	3	7	17.9	1	6
2	RH	229	30.41	35	4	1.7	1	49	21.4	7	137	59.8	21	39	17.0	6	35
2	SI	188	24.97	29	8	4.3	1	118	62.8	18	56	29.8	9	6	3.2	1	29
2	SP	128	17.00	20	0	0.0	0	65	50.8	10	53	41.4	8	10	7.8	2	20
2	SW	7	0.93	2	2	28.6	1	4	57.1	1	0	0.0	0	1	14.3	0	2
Class 2	TtIs	753	-	117	26	-	4	332	-	52	318	-	49	77	-	12	117
3	CC	223	35.28	23	1	0.4	0	177	79.4	19	42	18.8	4	3	1.3	0	23
3	DG	4	0.63	1	0	0.0	0	4	100.0	1	0	0.0	0	0	0.0	0	1
3	EF	124	19.62	13	3	2.4	0	98	79.0	10	17	13.7	2	6	4.8	1	13
3	SW	117	18.51	12	0	0.0	0	102	87.2	11	11	9.4	1	4	3.4	0	12
3	VU	164	25.95	17	0	0.0	0	164	100.0	17	0	0.0	0	0	0.0	0	17
Class 3	TtIs	632	-	66	4	-	0	545	-	58	70	-	7	13	-	1	66
Grnd	TtIs	1726	-	271	35	-	6	969	-	133	586	-	107	136	-	25	271

- Note 1:** Initial sample requirement calculation for each Class is rounded up in the event of fractional results.
- Note 2:** Overall system sample (column 5) which result in fractional values are rounded up, thus ensuring that the minimum required examination samples are achieved.
- Note 3:** Required sample calculations for each support type are rounded to the nearest whole number, which may result in slight differences between the initial overall required system sample (column 5) and the final overall required system sample (last column - which is the cumulative required sample by support type). Although not readily apparent, this deviation has been compensated for by adjusting column 11, the required rigid support sample by (± 1), as necessary. This column was chosen for this compensation, since there are more of these supports overall. Without this compensation, the final required sample (last column) could equate to less than the minimum required sample overall for the given Class/Item Number.

6.2 **INSERVICE EXAMINATION - CLASS 1, 2, AND 3 SUPPORTS
OTHER THAN PIPING SUPPORTS**

6.2.1 **Examination Category F-A, Supports Other Than Piping Supports**

6.2.1.1 **Supports Other Than Piping Supports (Class 1, 2, and 3), Item
Number F1.40**

In accordance with Table -2500-1, Examination Category F-A, of Code Case N-491, VCSNS nonexempt component supports, other than piping supports, will be visually (VT-3) examined during the second 10-year inspection interval.

The multiple-component concept applies to selection of Examination Category F-A, Item Number F1.40 supports. In accordance with Note 3 of Table -2500-1, the required examinations will be limited to the supports of only one component in each multiple-component group. For single components (not belonging to a multiple-component group), 100% of the supports associated with that component will be examined. See Appendix B for multiple-component group listings.

Note 4 of Table -2500-1, regarding re-selection of the same supports from the first interval, is considered applicable to non-piping supports. Therefore, to the extent practical, supports that were previously examined during the first inservice inspection interval will be reselected, and will be scheduled for the corresponding period in the second interval.

6.2.1.2

Examination Category F-A Summary (Supports Other Than Piping Supports)

Item Number	No. of Components	No. of Components Selected for Examination	Remarks ¹
F1.40 Class 1 Supports Other Than Piping Supports	7	3	Reactor Coolant Pumps A,B,C Steam Generators A,B,C Pressurizer (WA)
F1.40 Class 2 Supports Other Than Piping Supports	7	3	Charging Pumps A,B,C (WA's) RHR Pumps A,B (WA's) R.B. SPRAY Pumps A,B
F1.40 Class 3 Supports Other Than Piping Supports	29	13	Turbine Driven EFW Pump Motor Driven EFW Pumps A,B Chillers A,B,C (WA's) Chilled Water Pumps A,B,C Service Water Booster Pumps A,B Service Water Pumps A,B,C (WA's) Component Cooling Heat Exchangers A,B (WA's) Component Cooling Pumps A,B,C RHR Heat Exchangers A,B (WA's) Component Cooling Surge Tank (WA's) Condensate Storage Tank (WA's) Reactor Building Coolers 1A/B. & 2A/B Diesel Generator Coolers A,B (WA's)

Note 1: "WA" = Welded Attachment

6.3

INSERVICE TESTING OF SNUBBERS (IWF-5000)

Inservice testing of hydraulic and mechanical snubbers will be performed as required by the V.C Summer Nuclear Station's Technical Specification and the 803 Series of Surveillance Test Procedures per Relief Request RR-06

7.0

ISE PROGRAM - INTEGRAL ATTACHMENTS

Examination of VCSNS Class 1, 2, and 3 integral attachments during the second 10-year inspection interval will be performed in accordance with the alternative examination requirements of Code Case N-509, detailed in Relief Request RR-02.

This section herein summarizes the examination requirements of Code Case N-509, applicable to VCSNS Class 1, 2, and 3 integral attachment welds. Code Examination Categories and/or Item Numbers not applicable to VCSNS have been intentionally excluded.

7.1

INSERVICE EXAMINATION - CLASS 1, 2, AND 3 INTEGRAL ATTACHMENTS

Class 1, 2, and 3 integral attachments subject to the examination requirements of 7.1.1, 7.1.2 and 7.1.3 are limited to those nonexempt integrally welded attachments that meet the following conditions:

- the attachment is on the outside surface of the pressure retaining component,
- the attachment provides component support as defined in NF-1110, and
- the attachment weld joins the attachment either directly to the surface of the component or to an integrally cast or forged attachment to the component.

7.1.1

Class 1 Integral Attachments

7.1.1.1

Examination Category B-K, Integral Attachments For Class 1 Vessels, Piping, Pumps, and Valves

7.1.1.1.1

Pressure Vessel Integrally Welded Attachments, Item Number B10.10

In accordance with Relief Request RR-02, 100% of the VCSNS pressure vessel integrally welded attachments will be surface (MT) examined during the second 10-year inspection interval. The required examinations will be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B, and where practical, will be scheduled to parallel the sequence of examinations established during the first interval.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWB-2412.

7.1.1.1.2

Piping Integrally Welded Attachments, Item Number B10.20

In accordance with Relief Request RR-02, a sample of 10% of the VCSNS piping welded attachments associated with the Class 1 piping supports as described in IWF-2510, 1990 Addenda, will be surface (MT or PT) examined during the second 10-year inspection interval.

The required examinations will be completed in accordance with the scheduling requirements of Paragraph IWB-2412, Inspection Program B. Since the examination requirements of Relief Request RR-02, differ significantly from the Examination Category B-K-1 requirements of the first inservice inspection interval, scheduling of examinations to parallel the sequence of examinations established during the first interval may not be practical, and will be addressed on a case-by-case basis.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWB-2412.

7.1.1.1.3 Examination Category B-K Summary

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
B10.10 Pressure Vessel Integrally Welded Attachments	1	1	Pressurizer
B10.20 Piping Integrally Welded Attachments	10	1	10% of 10 = 1, therefore 1 IWA will be examined

7.1.2 Class 2 Integral Attachments

7.1.2.1 Examination Category C-C, Integral Attachments For Class 2
Vessels, Piping, Pumps, and Valves

7.1.2.1.1 Piping Integrally Welded Attachments, Item Number C3.20

In accordance with Relief Request RR-02, a sample of 10% of the VCSNS piping welded attachments associated with the Class 2 piping supports as described in IWF -2510, 1990 Addenda will be surface (MT or PT) examined during the second inservice inspection interval.

The required examinations will be completed in accordance with the scheduling requirements of Paragraph IWC-2412, Inspection Program B. Since the examination requirements of Relief Request RR-02, differ significantly from the Examination Category C-C requirements of the first inspection interval, scheduling of examinations to parallel the sequence of examinations established during the first interval may not be practical, and will be addressed on a case-by-case basis.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWC-2412.

7.1.2.1.2

Pump Integrally Welded Attachments, Item Number C3.30

In accordance with Relief Request RR-02, a sample of 10% of the VCSNS Class 2 pump integrally welded attachments associated with component supports selected for examination (6.2.1.1) will be surface (MT or PT) examined during the second 10-year inspection interval.

The required examinations will be completed in accordance with the scheduling requirements of paragraph IWC-2412, Inspection Program B. Since the examination requirements of Relief Request RR-02 differ significantly from the Examination Category C-C requirements of the first inspection interval, scheduling of examinations to parallel the sequence of examinations established during the first interval may not be practical and, will be addressed on a case-by-case basis.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWC-2412.

7.1.2.1.3

Examination Category C-C Summary

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
C3.20 Piping Integrally Welded Attachments	189	19	10% of 189 = 18.9, therefore 19 IWA's will be examined
C3.30 Pump Integrally Welded Attachments	5	1	RHR Pump A,B Charging Pump A,B,C 10% of 5 = .5, therefore 1 IWA will be examined.

7.1.3 Class 3 Integral Attachments

**7.1.3.1 Examination Category D-A, Integral Attachments For Class 3
Vessels, Piping, Pumps, and Valves**

7.1.3.1.1 Vessel Integrally Welded Attachments, Item Number D1.10

In accordance with Relief Request RR-02, one integrally welded attachment of one vessel in each group of nonexempt Class 3 vessels of similar design, function, and service, shall be visually (VT-1) examined during the second 10-year inspection interval.

The required examinations will be scheduled during the interval in accordance with Table IWD-2412-1, Inspection Program B.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWD-2412-1.

7.1.3.1.2 Piping Integrally Welded Attachments, Item Number D1.20

In accordance with Relief Request RR-02, a 10% sample of all nonexempt VCSNS Class 3 piping integral attachments, in those systems where corrosive attack of the integral attachment is expected to be prevalent, shall be visually (VT-1) examined during the second 10-year inspection interval. This percentage sample shall be proportional to the total number of nonexempt integrally welded attachments located within each system subject to these examinations.

The required examinations will be scheduled during the interval in accordance with Table IWD-2412-1, Inspection Program B.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWD-2412-1.

7.1.3.1.3

Pump Integrally Welded Attachments, Item Number D1.30

In accordance with Relief Request RR-02, a 10% sample of all nonexempt VCSNS Class 3 pump integral attachments, in those systems where corrosive attack of the integral attachment is expected to be prevalent, shall be visually (VT-1) examined during the second 10-year inspection interval. This percentage sample shall be proportional to the total number of nonexempt integrally welded attachments located within each system subject to these examinations.

The required examinations will be scheduled during the interval in accordance with Table IWD-2412-1, Inspection Program B.

Examinations will also be performed in the event component support member deformation is identified during operation, refueling, maintenance, inservice examination, or testing. These examinations will not be credited toward meeting the required examinations of IWD-2412-1

7.1.3.1.4

Examination Category D-A Summary

Item Number	No. of Components	No. of Components Selected for Examination	Remarks
D1.10 Vessel Integrally Welded Attachments	11	6	Component Cooling Surge Tank Condensate Storage Tank Diesel Generator Coolers A,B CCW Heat Exchanger A,B RHR Heat Exchanger A,B Chiller A,B,C Examine 1 per group.
D1.20 Piping Integrally Welded Attachments	82	9	10% sample of Class 3 piping integrally welded attachments.
D1.30 Pump Integrally Welded Attachments	3	1	Service Water Pump A,B,C 10% sample of Class 3 pump integrally welded attachments.

8.0

ISE PROGRAM - SYSTEM PRESSURE TESTING

VCSNS has elected not to include system pressure tests in the ISE Program. System Pressure Tests will be controlled by a separate program and therefore shall be conducted in accordance with Procedure SAP-145, ASME Section XI Pressure Testing Program.

9.0 AUGMENTED INSERVICE INSPECTION (ISE) PROGRAM

9.1 INTRODUCTION TO THE AUGMENTED ISE PROGRAM

The Code provides rules and requirements for the inservice inspection of systems and components in a nuclear power plant facility. These rules and requirements are intended to provide assurance of the structural and pressure-retaining integrity of nuclear power plant systems and components within the Section XI scope. However, throughout the service life of VCSNS, situations such as regulatory and enforcement authority rulings, industry events, and/or SCE&G specific concerns, may necessitate "augmented" inservice examinations which are outside of the scope of the Code.

Per 10CFR50.55a(g)(6)(ii), the NRC may at any time (via 10CFR50, NUREGs, I.E. Bulletins, Regulatory Guides, etc.) impose or request that augmented inservice examinations be performed on systems and components for which added assurance of structural reliability is desired. Industry group recommendations, or SCE&G specific concerns in response to a plant site event or any other situation, may necessitate examination and/or testing of a system/component to assure continued plant safety and/or reliability. The Augmented Inservice Examination Program - a subprogram within the overall SCE&G ISE program - exists to facilitate inspection of VCSNS critical systems and components in response to these sources. Augmented inservice examination requirements are exclusive of any Code inservice inspection requirements for the affected components.

9.2 THE AUGMENTED ISE SUBPROGRAMS

Figure 9.2-1 illustrates the individual "subprograms" which make up the VCSNS augmented examination program and their applicability to the second 10-year inspection interval. Since most of subprograms follow a subprogram-defined time line - and not the Code ten year interval - most programs are a continuation from the first inspection interval into the second. While these programs do not commence with the start of the second interval, and are not necessarily updated for the second inservice inspection interval, any references within these subprograms to the Code will be updated to the 1989 Edition.

Figure 9.2-1
Augmented Inservice Examination Subprograms

Reference Number	Title	Requirement Applicable to the First ISE interval?	Augmented Program for the Second ISE interval?	Remarks
N/A	Cracking in Feedwater System Piping	Yes	No	I.E. Bulletin 79-13
N/A	Degradation of Threaded Fasteners in the Reactor Coolant Pressure Boundary of PWR Plants	Yes	N/A	I.E. Bulletin 82-02; Procedurally controlled by maintenance activities.
N/A	Undersized Nozzle-to-Shell Welded Joints in Tanks and Heat Exchangers Constructed Under the Rules of the ASME Boiler and Pressure Vessel Code	Yes	No	I.E. Notice 85-33
N/A	Thermal Stresses in Piping Connected to Reactor Coolant Systems	Yes	No	NRC Bulletin No. 88-08
AUG-01	Reactor Coolant Pump Flywheel Integrity	Yes	Yes	Regulatory Guide 1.14
AUG-02	Piping Supports Exempted by Code Having Nonexempt Integrally Welded Attachments	Yes	Yes	

9.2.1 AUG-01, Regulatory Guide 1.14 - Reactor Coolant Pump Flywheel Integrity

The reactor coolant pump flywheels at VCSNS shall be examined in accordance with the recommendations outlined in Regulatory Guide 1.14, Revision 1, utilizing both surface and volumetric examination methods as specified. In accordance with Regulatory Guide 1.14, the extent and frequency of inservice examination should be as follows:

(1) An in-place ultrasonic (UT) volumetric examination of the areas of higher stress concentration at the bore and key way at approximately 3-year intervals, during the refueling or maintenance shutdown coinciding with the inservice inspection schedule as required by Section XI of the ASME Code.

(2) A surface (MT or PT) examination of all exposed surfaces and a complete ultrasonic volumetric examination at approximately 10-year intervals, during the plant shutdown coinciding with the inservice inspection schedule as required by Section XI of the ASME Code.

9.2.2

AUG-02, Piping Supports Exempt by Code Having Nonexempt
Integrally Welded Attachments

Certain piping supports which are exempt from Code examination requirements, have nonexempt integrally welded attachments connected to adjacent nonexempt piping systems. These supports have been identified by SCE&G for an augmented visual (VT-3) examination during the second inspection interval since they are considered important to the integrity of the nonexempt piping systems to which they are attached. Each of these supports will be examined once during the interval. These supports are listed in Appendix E.

10.0

RELIEF REQUESTS

In implementing the requirements of the Code and this ISE Program during the second 10-year inspection interval, circumstances may exist whereby, a request for relief from Code and/or ISE Program requirements may be necessary. Pursuant to 10CFR50.55a(g)(6)(i), where conformance with an examination requirement of the Code is deemed impractical, details of that determination and a request for relief from Code requirements, shall be submitted to the NRC.

In this ISE Program, and those augmented ISE subprograms which are mandated by the NRC, petitions for relief will be prepared, as needed, in the event:

- that conformance with certain Code or augmented examination requirements is impractical,
- that certain Code or augmented examinations or tests are impractical to perform (or to fully comply with) due to limitations in plant design, component geometry and/or materials of construction,
- when alternative requirements (in lieu of Code requirements), as found in unsanctioned Code Cases or Code editions and addenda, are deemed beneficial to this ISE Program.

10.1

RELIEF REQUEST MATRIX

Figure 10.1-1
First ISE Interval Relief Requests
vs.
Second ISE Interval Relief Requests

First Interval Relief Request Number	Second Interval Relief Request Number (Note 1)	Subject	Granted by the NRC for the First Interval?
1-RPV-1	(Note 2)	Class 1, B-F, B5.10 + 3.90 reactor vessel outlet nozzle to safe end welds (weld 1 on drawings CGE-1-4100, -4200, & -4300). Second interval exam to be performed at end of 1st interval. Class 1, B-J, B9.11 + 3.90 reactor vessel outlet safe end to pipe welds (weld 2 on drawings CGE-1-4100, -4200, & -4300). Second interval exam to be performed at end of 1st interval.	Yes* Note 2
1-RPV-2	N/A	Class 1, B-A, B1.40 - RPV Closure head to flange weld 1 - Extent of examination coverage.	Not Required
1-PRESS-1	N/A	Class 1, B-F, B5.20 - PZR nozzle to safe end welds - Extent of examination coverage. Class 1, B-J, B9.11 - PZR nozzle safe end to pipe welds - Extent of examination coverage.	Yes
1-PRESS-2	N/A	Class 1, B-D, B3.110 & B3.120 - PZR nozzle to vessel welds, and inside radius sections - Extent of examination coverage.	Yes
1-PRESS-4	N/A	Class 1, B-B, B2.11 - PZR circumferential head to shell welds - Extent of examination coverage.	Not Required
1-SG-1	N/A	Class 1, B-F, B5.30 - SG nozzle to safe end welds - Extent of examination coverage. Class 1, B-J, B9.11 - SG nozzle safe end to pipe welds - Extent of examination coverage.	Yes
1-PIPE-1	N/A	Class 1, B-J, B9.31 - Branch connection welds - Extent of examination coverage.	Yes
1-PIPE-2	N/A	Class 1, B-J, B9.11 & B9.12 - Circumferential & longitudinal welds - Extent of examination coverage.	Yes

First Interval Relief Request Number	Second Interval Relief Request Number (Note 1)	Subject	Granted by the NRC for the First Interval?
2-HX-1	N/A	Class 2, C-A, C1.10 & C1.20 - Vessel welds - Extent of examination coverage.	Yes
2-HX-2	N/A	Class 2, C-B, C2.20 - Nozzle to vessel welds - Extent of examination coverage.	Yes
2-HX-3	N/A	Class 2, C-A, C1.10 & C1.20 - Vessel welds - Relief from UT examination, surface and visual as alternative methods.	Yes
2-HX-4	N/A	Class 2, C-B, C2.20 - Nozzle to vessel welds - Relief from Code required UT & surface exams, surface exam on reinforcement saddle as alternative method.	Yes
2-SG-1	N/A	Class 2, C-B, C2.20 - Nozzle to vessel welds - Extent of examination coverage.	Yes
2-SG-2	N/A	Class 2, C-A, C1.10 & C1.20 - Vessel welds - Extent of examination coverage.	Yes
2-PIPE-1	N/A	Class 2, C-F, C5.21 & C5.22 - Circumferential & longitudinal welds - Extent of examination coverage.	No
2-PIPE-2	N/A	Class 2, C-F, C5.21 & C5.22 - Circumferential & longitudinal welds - Extent of examination coverage.	No
	RR-02	Examination of Class 1, 2, & 3 nonexempt integrally welded attachments in accordance with the requirements of Code Case N-509.	
	RR-06	Class 1, 2 & 3 Snubbers will be examined and tested per Technical Specifications in lieu of ASME requirements.	

Note 1: N/A indicates that a parallel relief request for the second inspection interval is not needed.

Note 2: The NRC approval of this Relief applies to the second interval and all subsequent intervals.

10.2

VCSNS RELIEF REQUESTS - SECOND INSERVICE INSPECTION INTERVAL

All VCSNS requests for relief for the second inservice inspection interval submitted with this ISE Program, will include the following information, as applicable:

- A unique alphanumeric identifier for the Relief Request,
- Identification of the component(s) for which relief is being requested, including a brief description of the component,
- The ASME Code Class, Examination Category, and Item Number applicable to the component(s),
- The specific requirement(s) from which relief is requested, or for which alternative requirements are proposed,
- The basis for relief (e.g. information supporting the determination that the Code requirement is impractical to conform to),
- Where reasonable, a description of the substitute examination(s) or test(s) which will be performed in lieu of the requirements deemed impractical, and
- The schedule for implementation of the alternate examination or test.

APPENDIX A - Ultrasonic Examination Calibration Standards

APPENDIX A

Ultrasonic Examination Calibration Standards			
Calibration Standard Identification	Material	Size	Measured Thickness
CGE-1	SS	2" Sch 160	0.355
CGE-2	SS	3" Sch 160	0.448
CGE-3	SS	4" Sch 160	0.536
CGE-4	SS	6" Sch 160	0.746
CGE-5	SS	12" Sch 140	1.077
CGE-6	SS	14" Sch 140	1.217
CGE-7 RV Stud	CS	7"	7"
CGE-8 Press. Skt.	CS	1-1/2" x 4" x 13"	1.507
CGE-9 RC Pipe	CC/SS	3" x 3" x 8"	3.000
CGE-10	SS	1-1/2" Sch 160	0.285
CGE-11	SS	6" Sch 40	0.274
CGE-12	SS	8" Sch 40	0.341
CGE-13	SS	10" Sch 40	0.404
CGE-14	SS	12" Sch 40	0.374
CGE-15	SS	14" Sch 40	0.450
CGE-16	SS	10" Sch 140	1.053
CGE-17	CS	6" Sch 40	0.305
CGE-18	CS	8" Sch 100	0.625
CGE-19	CS	16" Sch 80	0.846
CGE-20	CS	12" Sch 80	0.669
CGE-21	CS	18" Sch 80	0.933
CGE-22	CS	32"	1.201
CGE-23 Unclad	CS	3-1/2" x 6" x 18"	3.500
CGE-24 Clad	CS	3-1/2" x 6" x 12-1/4"	3.500
CGE-25 Clad	CS	5-1/2" x 6" x 19-1/4"	5.500
CGE-26	CS	30"	1.810
CGE-27	CS	24" Sch 80	1.198
CGE-28	SS	6" Sch 120	0.581
CGE-29	SS	8" Sch 160	0.904
CGE-30	SS	312" x 4" x 9"	0.313
CGE-31	SS	755" x 4" x 9"	0.755
CGE-33	CS	7" x 6" x 27"	7.000
CGE-34	CS	14" Sch 60	0.598
CGE-35	CS	16" Sch 30	0.373
CGE-36	CS	2" x 6" x 10-3/4"	2.000
CGE-37	CS	8" Sch 40	0.323
UT-002 RC Pipe	SS	4" x 2.6" x 9"	2.330

Appendix B - Multiple-Component Group

APPENDIX B

Multiple-Component Groups					
Group Number	Component Id(s)	Component Description	Cast/Forged Material	Code Class	Function
SG-01	XSG-2A-RC XSG-2B-RC XSG-2C-RC	Steam Generator	(1) SA-216 GR-WCC (2) SA-533 GR-A	1/2	Steam Generators
HX-01	XHE-5A-RH XHE-5B-RH	Heat Exchanger	SA-304 CS	2/3	Residual Heat Removal Heat Exchangers
HX-02	XHE-2A-CC XHE-2B-CC	Heat Exchanger	SA-515 GR-70	3	Component Cooling Heat Exchangers
HX-03	XAA-0001A XAA-0001B XAA-0002A XAA-0002B	Heat Exchanger	SA-36 Plate	3	Reactor Building Coolers
HX-04	XHE-0017A XHE-0017B	Heat Exchanger	SA-106	3	Diesel Generator Coolers
HX-05	XHX-0001A XHX-0001B XHX-0001C	Heat Exchanger	SA-515 GR-70	3	Chillers
PU-01	XPP-30A-RC XPP-30B-RC XPP-30C-RC	Pump	SA-351 CFB	1	Reactor Coolant Pumps
PU-02	XPP-43A-CS XPP-43B-CS XPP-43C-CS	Pump	SA-182 GR-F304	2	Charging Pumps
PU-03	XPP-38A-SP XPP-38B-SP	Pump	SA-316	2	Reactor Building Spray Pumps
PU-04	XPP-31A-RH XPP-31B-RH	Pump	SA-182 GR-F304	2	Residual Heat Removal Pumps
PU-05	XPP-48A-VU XPP-48B-VU XPP-48C-VU	Pump	SA-216 WCB	3	Chilled Water Pumps

Multiple-Component Groups					
Group Number	Component Id(s)	Component Description	Cast/Forged/ Material	Code Class	Function
PU-06	XPP-1A-CC XPP-1B-CC XPP-1C-CC	Pump	SA-216	3	Component Cooling Pumps
PU-07	XPP-21A-EF XPP-21B-EF	Pump	SA-487	3	Emergency Feedwater Pumps
PU-08	XPP-39A-SW XPP-39B-SW XPP-39C-SW	Pump	SA-352	3	Service Water Pumps
PU-09	XPP-45A-SW XPP-45B-SW	Pump	SA-216 WCB	3	Service Water Booster Pumps
VL-01	XVS-8010A XVS-8010B XVS-8010C	6" Relief Valve	Forged SA-182	1	Over pressure protection of RCS during transients.
VL-02	XVG-8701A XVG-8701B XVG-8702A XVG-8702B	12" Gate Valve	Forged SA-182	1	
VL-03	XVC-8948A XVC-8948B XVC-8948C XVC-8956A XVC-8956B XVC-8956C	12" Check Valve	Forged SA-182	1	SI accumulator isolation from the RCS.
VL-04	XVC-8998A XVC-8998B XVC-8998C	6" Check Valve	Forged SA-182	1	Low-Head/Hi-Head SI isolation to the RCS cold leg.
VL-05	XVC-8993A XVC-8993B XVC-8993C	6" Check Valve	Forged SA-182	1	Low-Head/Hi-Head SI isolation to the RCS hot leg.
VL-06	XVC-8973A XVC-8973B XVC-8973C XVC-8988A XVC-8988B	6" Check Valve	Forged SA-182	1	Low-Head SI isolation when Hi-Head SI is in service.

APPENDIX C - INSERVICE INSPECTION DRAWINGS

Inservice Inspection Drawings

ISE Classification and Boundary Identification Drawings (Flow Diagrams)

D-302-011	Main Steam (Nuclear)
D-302-083	Feedwater (Nuclear)
D-302-085	Emergency Feedwater (Nuclear)
D-302-221	Service Water Cooling
D-302-222	Service Water Cooling
D-302-353	Diesel Generator - Miscellaneous Services
E-302-601	Reactor Coolant
E-302-602	Reactor Coolant
D-302-611	Component Cooling
D-302-612	Component Cooling Inside Reactor Building
D-302-613	Component Cooling System Non-Essential Cooling
E-302-641	Residual Heat Removal
D-302-651	Spent Fuel Cooling
D-302-661	Reactor Building Spray System
E-302-671	Chemical & Volume Control
E-302-672	Chemical & Volume Control
E-302-673	Chemical & Volume Control
E-302-675	Chemical & Volume Control
E-302-691	Safety Injection
E-302-692	Safety Injection
E-302-693	Safety Injection
D-302-841	Chilled Water - Pump and Chiller Area
D-302-842	Chilled Water - To Cooling Coils "A"
D-302-843	Chilled Water - To Cooling Coils "B"

ISE Composite Isometric Sketches & Component Drawing

1MS-17-084-5	C-314-251-02	C-314-671-03
1MS-22-108-0-5	C-314-251-04	C-314-671-06
1MS-22-110	C-314-251-05	C-314-671-07
1MS-22-2262-1	C-314-251-07	C-314-671-08
1MS-22-2263-1	C-314-251-08	C-314-671-10
1MS-22-2264-1	C-314-251-11	C-314-671-11
1MS-22-260-0-9	C-314-251-12	C-314-671-12
1MS-22-261-0-9	C-314-251-13	C-314-671-23
1MS-22-2692-4	C-314-251-15	C-314-671-24
1MS-22-303-0-2	C-314-251-17	C-314-671-25
1MS-22-384-4	C-314-601-01	C-314-671-27
1MS-22-391-2	C-314-601-03	C-314-671-31
1MS-22-550-0-3	C-314-601-04	C-314-691-01
1MS-22-551-0-4	C-314-601-05	C-314-691-02
1MS-22-552-0-3	C-314-601-28	C-314-691-03
1MS-22-553-0-4	C-314-611-01	C-314-691-04
1MS-22-554-0-4	C-314-611-06	C-314-691-05
1MS-22-559-0-5	C-314-611-08	C-314-691-06
1MS-22-560-0-8	C-314-611-09	C-314-691-07
1MS-22-561-0-5	C-314-611-10	C-314-691-08
1MS-22-623-0-3	C-314-611-11	C-314-691-09
1MS-22-624-0-4	C-314-611-12	C-314-691-10
1MS-22-625-0-3	C-314-611-13	C-314-691-11
1MS-22-626-6	C-314-611-14	C-314-691-12
1MS-22-638-0-2	C-314-611-15	C-314-691-13
1MS-22-698-0-2	C-314-611-16	C-314-691-14
1MS-54-087-1-8	C-314-611-17	C-314-691-15
1MS-54-617-1	C-314-611-18	C-314-691-16
C-314-011-01	C-314-641-01	C-314-691-17
C-314-011-02	C-314-641-02	C-314-691-18
C-314-011-03	C-314-641-03	C-314-691-19
C-314-011-14	C-314-641-04	C-314-691-20
C-314-011-15	C-314-641-05	C-314-691-21
C-314-011-16	C-314-641-06	C-314-691-22
C-314-011-20	C-314-641-07	C-314-691-23
C-314-011-21	C-314-641-08	C-314-691-24
C-314-011-22	C-314-641-11	C-314-691-25
C-314-081-01	C-314-641-14	C-314-691-26
C-314-081-02	C-314-641-15	C-314-731-01
C-314-081-03	C-314-661-01	CGE-1-1100
C-314-081-23	C-314-661-02	CGE-1-1100A
C-314-081-25	C-314-661-03	CGE-1-1100B
C-314-081-27	C-314-661-04	CGE-1-1200
C-314-081-30	C-314-661-05	CGE-1-1200A
C-314-081-31	C-314-661-06	CGE-1-1250
C-314-081-32	C-314-661-07	CGE-1-1300
C-314-085-01	C-314-661-08	CGE-1-1300A
C-314-085-02	C-314-661-09	CGE-1-1400
C-314-085-03	C-314-661-12	CGE-1-2100A
C-314-085-04	C-314-661-13	CGE-1-2100B
C-314-085-05	C-314-671-02	CGE-1-3100

ISE Composite Isometric Sketches & Component Drawing

CGE-1-4100A	CGE-2-1130A	CGE-2-2558
CGE-1-4101A	CGE-2-1140A	CGE-2-2559
CGE-1-4102A	CGE-2-1150	CGE-2-2560
CGE-1-4103A	CGE-2-1160	CGE-2-2561
CGE-1-4104A	CGE-2-1200	CGE-2-2562
CGE-1-4105A	CGE-2-1220	CGE-2-3000
CGE-1-4106A	CGE-2-1310	CGE-2-3001
CGE-1-4107A	CGE-2-1320	CGE-2-3002
CGE-1-4110A	CGE-2-2100A	CGE-2-3003
CGE-1-4111A	CGE-2-2101A	CGE-2-3004
CGE-1-4112A	CGE-2-2101B	CGE-2-3005
CGE-1-4113A	CGE-2-2102A	CGE-2-3006
CGE-1-4114A	CGE-2-2103A	CGE-2-3007
CGE-1-4200A	CGE-2-2104A	CGE-2-3008
CGE-1-4201A	CGE-2-2200A	CGE-2-3009
CGE-1-4202A	CGE-2-2201A	CGE-2-3010
CGE-1-4203A	CGE-2-2202	CGE-2-3011
CGE-1-4205A	CGE-2-2203	CGE-2-3012
CGE-1-4208A	CGE-2-2204A	CGE-2-3013
CGE-1-4209A	CGE-2-2300	CGE-2-3014
CGE-1-4209P	CGE-2-2301	CGE-2-3100
CGE-1-4210A	CGE-2-2302	CGE-2-3110
CGE-1-4211A	CGE-2-2303	CGE-2-4100
CGE-1-4212	CGE-2-2304	E-302-085
CGE-1-4300A	CGE-2-2500	E-302-221
CGE-1-4301	CGE-2-2501	E-302-222
CGE-1-4302	CGE-2-2520A	E-302-601
CGE-1-4303	CGE-2-2521A	E-302-611
CGE-1-4304	CGE-2-2521B	
CGE-1-4308	CGE-2-2522A	
CGE-1-4309	CGE-2-2522B	
CGE-1-4310	CGE-2-2523A	
CGE-1-4311	CGE-2-2523B	
CGE-1-4312	CGE-2-2523C	
CGE-1-4500A	CGE-2-2524	
CGE-1-4501	CGE-2-2525	
CGE-1-4502	CGE-2-2526	
CGE-1-4503	CGE-2-2540A	
CGE-1-4504	CGE-2-2540B	
CGE-1-4505A	CGE-2-2541	
CGE-1-4506A	CGE-2-2550	
CGE-1-4700	CGE-2-2551A	
CGE-1-5100	CGE-2-2551B	
CGE-1-5100A	CGE-2-2552	
CGE-1-5100B	CGE-2-2553	
CGE-1-5100C	CGE-2-2554	
CGE-1-6200	CGE-2-2556A	
CGE-1-6300	CGE-2-2557A	
CGE-2-1100		
CGE-2-1110		
CGE-2-1120A		

APPENDIX D - Relief Requests

RELIEF REQUEST 1-RPV-1

I. IDENTIFICATION OF COMPONENTS

V.C. Summer Nuclear Station, Class 1 Reactor Vessel Outlet Nozzle-to-safe End Welds, and Outlet Safe End-to-pipe Welds:

Isometric Drawing	Weld Number	Category	Item Number
CGE-1-4100	1*	B-F; B-D	B5.10; 3.90
CGE-1-4200	1*	B-F; B-D	B5.10; 3.90
CGE-1-4300	1*	B-F; B-D	B5.10; 3.90
CGE-1-4100	2	B-J; B-D	B9.11; 3.90
CGE-1-4200	2	B-J; B-D	B9.11; 3.90
CGE-1-4300	2	B-J; B-D	B9.11; 3.90

* Dissimilar Metal

II. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition including Summer 1978 Addenda, Table IWB-2500-1, Category B-D: Item B3.90, requires the following inspection in the second interval.

All Welds which apply to Item B3.90 are to have volumetric examinations performed each inspection interval such that at least 25% but not more than 50% (credited) of the nozzles shall be examined by the end of 1st inspection period and the remainder by the end of 3rd inspection period of each inspection interval. (The above welds represent 50% of the welds).

III. ALTERNATE TEST

Perform the second ten year interval examinations on the welds listed above during the seventh refueling (RF-7) outage; which is eight months prior to the beginning of the second interval. Also, revise the examination requirements such that 100% of the nozzle-to-vessel welds are inspected in the 3rd period of the 2nd and subsequent inspection intervals.

IV. BASIS FOR RELIEF

First, the second ten year inspection interval begins approximately eight months after RF-7. Second, by performing these examinations during RF-7, the outlet nozzles will be inspected in the same outage as the inlet nozzles utilizing one Ultrasonic Testing (UT) acquisition system. This provides common acquisition data which will increase the reliability of the data as it relates to the condition of both the inlet and outlet nozzles. Third, the reactor lower internals will be removed during the RF-7 outage as opposed to being in place during the second interval inspection. This prevents the possibility of the remote examination equipment causing damage to the lower internals during the second interval inspection.

Furthermore, delaying these examinations will result in the following hardships:

- (1) The predicted dose related to performing these examinations in the second 10 year interval is 2.5 REM greater than performing the inspection during RF-7.
- (2) The additional manpower, cost, and critical path outage time associated with performing these examinations in the second interval would be saved by performing the examinations in RF-7.

In summary, performing the examinations approximately eight months prior to the second ten year interval creates several advantages and avoids some hardships without affecting the level of quality of safety in the plant.

RELIEF REQUEST RR-02

INTEGRALLY WELDED ATTACHMENT
RELIEF REQUEST (CODE CASE N-509)

COMPONENTS:

All Class 1, 2, and 3 integrally welded attachments subject to inspection per Section XI of the 1989 Edition of the ASME Code.

CODE REQUIREMENT:

IWB-2500, IWC-2500 and IWD-2500 of the 1989 Edition of ASME Section XI requires that all integrally welded attachments that apply to the examination categories B-H, B-K-1, C-C, D-A, D-B and D-C are examined each interval.

RELIEF REQUEST:

To be allowed the option of utilizing the provisions of Code Case N-509, "Alternative Rules for The Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments Section XI, Division 1".

BASIS FOR RELIEF:

Code Case N-509 has been developed and approved (11-25-92) by the ASME as an acceptable alternative to the above requirements. This alternative is based on the optimization of support inspection which combines the focus of integrally welded attachments with overall support inspection and emphasizes those attachments associated with a deformed support member. The approval of the Code Case by ASME demonstrates the position that the current requirements are more extensive than is required to assure system integrity. Thus, SCE&G believes that applying the current Code Requirements presents an undue hardship without a corresponding increase in safety. Therefore SCE&G request approval to allow the option of applying Code Case N-509 to the 2nd ten-year interval.

RR-06

SNUBBER RELIEF REQUEST

COMPONENTS:

All Non-exempt snubbers required to be inspected and tested by the provisions of IWF-5300.

CODE REQUIREMENT:

Subarticle IWF-5300 of the 1989 edition of the ASME Boiler Pressure Vessel Code, Section XI requires that snubbers are to undergo inservice examination and testing per the 1988 Addenda to ASME/ANSI OM-1987, Part 4. These requirements provide the methodology and corrective actions for examining snubbers and for functional testing snubbers.

RELIEF REQUEST:

To exempt the applicable snubbers from the requirements of IWF-5300 and as an alternative, perform the required examination and testing of snubbers as prescribed by Technical Specifications.

ALTERNATE TEST:

Apply the visual examination and functional testing requirements that are prescribed by Technical Specifications (including sampling and frequency requirements) to the components identified above.

BASIS FOR RELIEF:

V. C. Summer Nuclear Station (VCSNS) is required to incorporate the 1989 edition of the ASME Code as the governing requirement for the second ten-year inservice inspection interval. These requirements contain snubber examination and testing methodologies that are nearly identical to the methodologies prescribed in the Technical Specification for examination and testing of snubbers. Having two nearly redundant sets of snubber requirements presents unnecessary confusion in sample selection, data collection, acceptance criteria, and corrective actions. These requirements will in some cases cause a duplication of test documentation. However, in other cases, additional confusion is created by the difference in snubber categories. Approximately half of the snubbers at VCSNS are required to be tested by both Technical Specifications and the ASME Code. The other half are only required to be tested by one of the requirements. Therefore, sampling becomes very confusing since some snubbers may be applicable to both requirements and others to only one. For the same reason acceptance criteria and corrective actions become difficult to apply.

One area where the requirements do not closely resemble each other is the inspection frequency changes in response to visual examination failures. The differences can cause different frequency requirements to be prescribed to a single group of snubbers as a result of the same inspection. This situation obviously would increase the possibility of applying the wrong action thus creating a nonconformance, an inoperability or even a violation of Technical Specifications. Also, the ASME has recently approved a revision to the snubber examination requirements that incorporates the Technical Specification Table for inspection frequency into Section XI. Therefore, the ASME is in agreement that these actions should not be in conflict.

In order to remove the confusion and impracticability of trying to administer such similar requirements to snubber categories that partially overlap and to remove the possibility of requiring contradicting actions to apply to the same snubber(s), VCSNS believes that meeting the requirements that are contained in the Technical Specifications for all the snubbers which apply to either category will provide sufficient testing of snubbers. Therefore, the proposed alternate test will provide an acceptable level of quality, and compliance with the Code would result in a hardship without a compensating increase in quality or safety.