

1984 REMOTE VISUAL EXAMINATION OF THE CORE SPRAY SPARGER
SYSTEM OF PILGRIM NUCLEAR POWER STATION, UNIT 1

FINAL REPORT
SwRI Project 7861

Prepared for

Boston Edison Company
800 Boylston Street
Boston, Massachusetts 02199

May 1984



SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO HOUSTON

8406210321 840618
PDR ADOCK 05000293
Q PDR

SWRI

1984 REMOTE VISUAL EXAMINATION OF THE CORE SPRAY SPARGER
SYSTEM OF PILGRIM NUCLEAR POWER STATION, UNIT 1

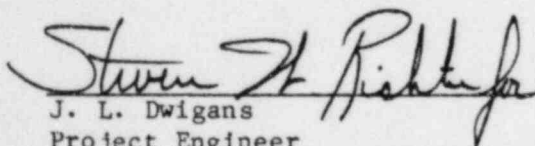
FINAL REPORT
SwRI Project 7861

Prepared for

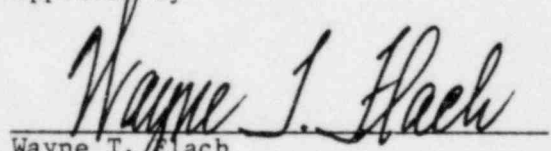
Boston Edison Company
800 Boylston Street
Boston, Massachusetts 02199

May 1984

Prepared by


J. L. Dwigans
Project Engineer
Inspection Engineering Section

Approved by


Wayne T. Flach
Director
Department of Engineering Services
Quality Assurance Systems
and Engineering Division

ABSTRACT

A remote visual examination of the Core Spray Sparger system of the reactor pressure vessel (RPV) of Boston Edison Company's Pilgrim Nuclear Power Station, Unit 1, was performed during the 1984 refueling outage. This was the third examination of this type performed on the core spray sparger system and the first performed during the second 10-year interval of commercial operation. The areas examined included the reactor vessel core spray piping and spargers.

The examinations revealed no apparent change in the conditions reported during the 1981 examinations. No other areas of concern were identified.

TABLE OF CONTENTS

	<u>Page</u>
LIST OF ABBREVIATIONS	iv
I. INTRODUCTION	1
A. Applicable Documents	1
B. Examination Areas	1
C. Summary of Examination Results	1
II. DETAILS OF THE INSERVICE EXAMINATION	3
A. Equipment	3
B. Radiation Exposure	3
C. Explanation of Field Data Records	3
D. Summary of Nondestructive Examinations	3

APPENDICES

- A. Southwest Research Institute Nuclear Projects
 Operating Procedures
- B. Southwest Research Institute Nondestructive
 Testing Procedure
- C. Certificates of Personnel Qualifications
- D. Nuclear Regulatory Commission Inspection and
 Enforcement Bulletin No. 80-13
- E. Relook Results - 2/24/84

FIELD DATA

- Core Spray Sparger A
- Core Spray Sparger B
- Core Spray Sparger C
- Core Spray Sparger D
- Core Spray Piping

LIST OF ABBREVIATIONS

ASME	-	American Society of Mechanical Engineers
BEC	-	Boston Edison Company
CNF	-	Customer Notification Form
ISI	-	Inservice Examination
NDT	-	Nondestructive Testing
NRC	-	Nuclear Regulatory Commission
QA	-	Quality Assurance
RPV	-	Reactor Pressure Vessel
SwRI	-	Southwest Research Institute
VT	-	Visual Examination

I. INTRODUCTION

During the 1984 refueling outage, Southwest Research Institute (SwRI) personnel performed remote visual (VT) examinations of the Core Spray Sparger system in Boston Edison Company's (BECO) Pilgrim Nuclear Power Station, Unit 1. This examination was a follow-up to the January 1980 and October 1981 examinations and was performed to meet the intent of the Nuclear Regulatory Commission Inspection and Enforcement Bulletin No. 80-13.

A. Applicable Documents

The examinations were performed in accordance with the following documents:

- Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1980 Edition, with Addenda through Winter 1980. In addition, the examination addressed the requirements of the Inspection and Enforcement Bulletin 80-13 and provided visual resolution of a 0.001-inch diameter wire placed in the examination area.
- SwRI Project Plan for the 1984 Inservice Remote Visual Examination of Core Spray Spargers at Pilgrim Nuclear Power Station, Unit 1.

B. Examination Areas

As a continuing observation of the indications detected during the January 1980 and October 1981 outages, accessible portions of the following components and areas were examined using remote VT techniques.

Reactor Pressure Vessel

- Core Spray Sparger A
- Core Spray Sparger B
- Core Spray Sparger C
- Core Spray Sparger D
- Core Spray Piping

The remote VT examinations were conducted in accordance with SwRI Non-destructive Testing (NDT) procedure 900-7, Rev. 6, which was written to conform to the requirements of the applicable sections of the ASME Boiler and Pressure Vessel Code and the SwRI Nuclear Quality Assurance Program Manual. A copy of this SwRI NDT procedure is included in Appendix B.

C. Summary of Examination Results

The interpretation of the examination results was performed in accordance with the SwRI Examination Plan prepared for Project 17-7861. The

resulting data (video tapes) was evaluated by a Level III visual examiner, qualified by experience and written examination. Reexamination was accomplished as considered necessary to resolve the various types of indications.

SwRI operating procedures applicable during the examinations are included in Appendix A.

The remote VT examinations revealed numerous insignificant indications. The indications in the Core Spray Sparger Piping were determined to be of the same magnitude as the previously reported indications. These indications appear to have stabilized with respect to crack propagation and further degradation is not anticipated. As with the previous examinations, several examination areas were limited because of structural interference.

A number of typical indications were selected for reexamination to provide added assurance that the general interpretations were correct. These indications were recorded and labeled "Relooks." A brief description of the relook results is included as Appendix E.

The previously identified area which includes the B junction box-to-pipe weld on the 0° side and extends to and including the first spray nozzle (No. 25) was specifically reexamined. There has been no apparent change since the October 1981 examination. No other areas of concern were identified.

There has been no observable change in the sparger condition since the October 1981 examination.

Examination personnel were certified in accordance with SwRI Nuclear Quality Assurance Procedures 11-1 and 11-2 which incorporate the guidelines of SNT-TC-1A of the American Society for Nondestructive Testing. A copy of each individual's certification is included in Appendix C.

Appendix D contains a copy of the Nuclear Regulatory Commission Inspection and Enforcement Bulletin No. 80-13.

II. DETAILS OF THE INSERVICE EXAMINATION

This section of the report provides a discussion of the equipment used and radiation exposure encountered during the inservice inspection (ISI), an explanation of field data records, and a summary of the nondestructive examinations performed.

A. Equipment

A remote video system, with cameras provided by BECo and manipulation equipment by Consulting Personnel Services, Inc., was used for the VT examinations. Certain portions of the video tape recorded data were computer enhanced to improve resolution. The video enhancement equipment was provided by APTEC Imaging, Inc.

B. Radiation Exposure

Radiation exposure encountered during the examinations was of fundamental concern to all SwRI personnel involved during the daily examination activities. SwRI personnel took the necessary precautions in order to minimize overall exposure and consequently received the minimum dosage practicable while performing the examinations. The radiation level on the refueling crane, where the examination personnel were primarily located, was approximately 15 mRem per hour.

C. Explanation of Field Data Records

The results of the examinations performed by SwRI personnel were recorded on standard SwRI forms. These completed documents constitute a portion of the ISI report. The original records are retained in the SwRI Data Storage Facility, and copies are provided herein for completeness.

The Visual Examination Record Sheets for each examination area are assembled into a package preceded by a Summary Sheet. The examination areas and summary sheet numbers correspond to those listed in the Summary Table. These record sheets were used to record the results of the examinations. Also, the material used in the examinations is identified on the sheets.

D. Summary of Nondestructive Examinations

The following section of this report is the Summary of Nondestructive Examinations Table (Summary Table). The Summary Table provides information and results for the nondestructive examinations performed during this remote VT examination. See Figure 1 for an explanation of the Summary Table format.

ASME SEC. XI ITEM NO.	ASME SEC. XI CATGY.	EXAMINATION AREA IDENTIFICATION	EXAM. METHOD	SwRI PROCEDURE NO./REV.	WELD EXAM. SUM SHEET NO.	INDICATIONS				REMARKS
						NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER	
										<p>The remarks column is used to describe any pertinent feature of the examination such as limitations, reportable results, CNFs, etc. Ultrasonic calibration blocks are also listed here.</p> <p>The presence of indications which are deemed reportable to the customer is indicated in this column.</p> <p>The presence of ultrasonic indications shown to be the results of a geometric feature of the examination area is indicated in this column.</p> <p>The presence of nonrelevant indications or ultrasonic indications which are equal to or greater than recording amplitude but less than evaluation level is indicated in this column.</p> <p>The absence of indications equal to or greater than the recording level of the respective NDT procedure is indicated in this column.</p> <p>This column references the examination summary sheet which serves as a cover sheet for the data package and lists the data record numbers, the examiners, and any pertinent remarks.</p> <p>This column lists the applicable SwRI NDT procedure used for the examination.</p> <p>The NDT method used during the examination is listed in this column.</p> <p>Each examination area is listed in this column. Details of the weld identification system are contained in Appendices A and B.</p> <p>The ASME Section XI item number and category of the examination area are listed in these columns.</p>

Figure 1. Explanation of Summary Table Format

PILGRIM NUCLEAR POWER STATION, UNIT 1
1984 INSERVICE REMOTE VISUAL EXAMINATIONS

REACTOR PRESSURE VESSEL

ASME SEC. XI ITEM NO.	ASME SEC. XI CATGY.	EXAMINATION AREA IDENTIFICATION	EXAM. METHOD	SwRI PROCEDURE NO./REV.	WELD EXAM. SUM. SHEET NO.	INDICATIONS				REMARKS
						NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER	
		VESSEL INTERIOR								
B13.20	B-N-2	Sparger A (Upper Sparger)	VT-1	900-7/6	786101		X			Examination of Sparger "A", including relook of 1981 indication areas, revealed all indications to be insignificant.
B13.20	B-N-2	Sparger B (Lower Sparger)	VT-1	900-7/6	786102				X	Examination of Sparger "B", including relook of 1981 indication areas at 345° (0° side), weld, and Nozzle B25 show no observable change. No other significant indications.
B13.20	B-N-2	Sparger C (Upper Sparger)	VT-1	900-7/6	786103		X			Examination of Sparger "C", including relook of 1981 indication areas, revealed all indications to be insignificant.
B13.20	B-N-2	Sparger D (Lower Sparger)	VT-1	900-7/6	786104		X			Examination of Sparger "D", including relook of 1981 indication areas, revealed all indications to be insignificant.
B13.20	B-N-2	Core Spray Piping	VT-1 VT-3	900-7/6	786105		X			Examination of the Core Spray Piping, including piping support brackets, revealed all indications to be insignificant.

APPENDIX A

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS OPERATING PROCEDURES

APPENDIX A

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS OPERATING PROCEDURES

Table of Contents

<u>Procedure No./Rev.</u>	<u>Title</u>
IX-FE-101-2	Deviations to Nuclear Projects Operating Procedures
X-FE-101-2	Onsite NDE Records Control
XIII-AG-101-2	Control of Nuclear Inspection Equipment and Materials
XVII-AG-101-1 Change 1	Data Storage and Retrieval



**SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE**

IX-FE-101-2

October 1981

Page 1 of 6

Title

DEVIATIONS TO NUCLEAR PROJECTS OPERATING PROCEDURES

EFFECTIVITY AND APPROVAL

Revision 2 of this procedure became effective on Nov. 2, 1981. This procedure consists of the pages and changes listed below.

Page No

Change

Date Effective

1 through 6

-

November 2, 1981

SA

[Signature]

Approvals

Written By

[Signature]

Date

10/30/81

Technical Review

[Signature]

Date

30 Oct 81

Manager of Q.A.

[Signature]

Date

11/2/81

Cognizant Director

[Signature]

Date

11/2/81

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

IX-FE-101-2

October 1981

Page 2 of 6

DEVIATIONS TO NUCLEAR PROJECTS OPERATING PROCEDURES

1.0 PURPOSE

- 1.1 The purpose of this operating procedure is to establish guidelines and controls for deviations to Nuclear Projects Operating Procedures.

2.0 SCOPE AND APPLICATION

- 2.1 This procedure applies to Nuclear Projects Operating Procedures.
- 2.2 Deviations written in accordance with this procedure shall be applicable only to the specified plant and examination area described in the Procedure Deviation, SwRI Form FE-4-3 (sample attached).
- 2.3 Deviations written in accordance with this procedure do not constitute permanent changes or revisions to the applicable procedures.
- 2.4 This procedure meets the requirements of SwRI Nuclear Quality Assurance Program Manual (NQAPM).

3.0 RESPONSIBILITY

- 3.1 The Director of the Department of Engineering Services, or his designated alternate within the Quality Assurance Systems and Engineering Division, shall be responsible for the initiation of this procedure.
- 3.2 Qualification of deviations to operating procedures shall be the responsibility of the Director of the Department of Engineering Services, or his designated alternate.
- 3.3 The Assistant Manager of the Technical Activities Group, Team Supervisor, or other cognizant persons using the procedure shall be responsible for initiating the request for a deviation to the operating procedure.
- 3.4 The Department Director, or his designated alternate, shall be responsible for approval of operating procedure deviations.
- 3.5 The Manager of Quality Assurance, or his designated alternate, shall be responsible for reviewing and approving proposed deviations to operating procedures against the requirements of this procedure.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

IX-FE-101-2

October 1981

Page 3 of 6

4.0 PROCEDURE

- 4.1 The Assistant Manager of the Technical Activities Group, Team Supervisor, or other cognizant persons who require a deviation to a Nuclear Projects Operating Procedure shall be responsible for initiating a Procedure Deviation, SwRI Form FE-4-3. Deviations may be required due to changing technology, applicable code changes or interpretations, plant or component design, customer requirements, or special cases.

If the procedure deviation is initiated by a telephone call from the field, and the requestor is not available to sign the request, his name shall be typed in the "Requested By" block.

- 4.2 The Assistant Director of the Department of Engineering Services, or his designated alternate, shall assign responsibility for preparing the procedure deviation.

- 4.2.1 The Procedure Deviation, SwRI Form FE-4-3, shall have, but not be limited to, the following information:

- (1) Site
- (2) Procedure Number
- (3) Procedure Section and Page
- (4) Deviation Number
- (5) Date Requested
- (6) Examination Area(s) and Specific Outage Affected by Deviation(s)
- (7) Deviation Required
- (8) Justification for Deviation(s).

- 4.2.2 Deviation numbers shall be assigned by the Manager of the Support and Administration Section, or designated alternate, and shall be in numerical sequence beginning with "1" for each procedure revision.

- 4.3 The procedure deviation shall be qualified by either field use, laboratory verification, or review by a qualified Level III individual, under the direction of the Director of the Department of Engineering Services or his designated alternate.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

IX-FE-101-2

October 1981

Page 4 of 6

- 4.4 Upon qualification in accordance with Paragraph 4.3, and verification that the procedure deviation is in compliance with the applicable code/other requirements, the person conducting the technical review shall sign the deviation.
- 4.5 The Manager of Quality Assurance, or his designated alternate, shall verify that the deviation is in compliance with this procedure and sign the procedure deviation as reviewed and approved and forward it to the Department Director, or his designated alternate.
- 4.6 If approved, the Department Director, or his designated alternate, shall sign the procedure deviation and forward it to the Support and Administration Section for reproduction, copy distribution, and filing of the original document.
- 4.7 The final deviation shall carry the signatures as follows:
- (1) Requested By. Requestor, if available to sign. If he is not available, his name shall be typed in the "Requested By" block.
 - (2) Technical Review. A technical review shall be conducted by a person having an adequate understanding of the requirements and intent of the deviation, who does not administratively report to the author, and is a representative of the same group that performed technical review of the affected procedure.
 - (3) Approved By. Manager of Quality Assurance, or his designated alternate.
 - (4) Approved By. Department Director, or his designated alternate.
- 4.8 The requesting team supervisor may use the Procedure Deviation of the Nuclear Projects Operating Procedure upon receipt of the final approval and site approval of the deviation.
- 4.9 The deviation number shall be recorded in conjunction with the appropriate Nuclear Projects Operating Procedure number on all records requiring the recording of the procedure number.
- 4.10 A copy of the Procedure Deviation, SwRI Form FE-4-3, shall be attached to the applicable procedure when conducting examinations in accordance with the deviation.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE


IX-FE-101-2

October 1981

Page 5 of 6

5.0 RECORDS

- 5.1 Operating procedure deviations and any other documents generated in accordance with this procedure controlling the performance of onsite critical services shall be retained for the period specified in the contract with the Client. These records shall be indexed, filed, and maintained in the Data Storage Facility of the Quality Assurance Systems and Engineering Division.
- 5.2 A copy of the approved Procedure Deviation, SwRI Form FE-4-3, shall be forwarded to the Manager of Quality Assurance for the historical file.

		PROCEDURE DEVIATION				
		SITE:			PROCEDURE / REVISION NO.	
DC		DEVIATION NO.	PAGE OF	DATE REQUESTED:	SECTION:	PAGE OF
DATE		1. <u>EXAMINATION AREAS AFFECTED BY DEVIATION</u> : List each specific area or component to be examined in accordance with this deviation (state examination period, component identification, line identification, weld identification, etc.)				
DIRECTION		2. <u>DEVIATION</u> : It is requested that the paragraphs below in the above procedure / revision be deviated from as follows (use exact wording proposed, additional sheets may be used if necessary):				
DEPARTMENT						
DATE						
Q. A.						
MANAGER OF						
DATE						
TECHNICAL REVIEW						
DATE						
REQUESTED BY		3. <u>JUSTIFICATION</u> : Reason change is necessary and what it is wanted to accomplish (use additional sheets if necessary):				



**SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE**

X-FE-101-2

November 1982

Page 1 of 6

Title

ONSITE NDE RECORDS CONTROL

EFFECTIVITY AND APPROVAL

Revision two of this procedure became effective on 12/9/82. This procedure consists of the pages and changes listed below.

Page No

Change

Date Effective

SA

Approvals

Written By

DW Fournell

Date

11/29/82

Technical Review

Heather Wiley

Date

30 Nov 82

Manager of QA.

Brian Malais

Date

12/6/82

Cognizant Director

[Signature]

Date

12/9/82

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

X-FE-101-2

November 1982

Page 2 of 6

ONSITE NDE RECORDS CONTROL

1. PURPOSE

This procedure describes the onsite control processes for nondestructive examination records (data) generated in the field during preservice (PSI) and inservice (ISI) examinations.

2. SCOPE AND APPLICATION

- 2.1 This procedure describes the flow of data records used to document the results of nondestructive examinations performed. Data records include original data sheets, summary sheets, resolution sheets, strip charts, magnetic tapes, video tapes, and other information as defined by the Inspection Engineer or Team Supervisor.
- 2.2 This procedure provides guidance to personnel of the NDE Field Services Section who are assigned the responsibility of preparing, reviewing, or otherwise using data records while in the field performing a preservice or inservice examination.
- 2.3 Functional steps are provided in this procedure to explain the flow of the records.

3. RESPONSIBILITY

- (1) The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, shall be responsible for the preparation, review, approval, and control of this procedure.
- (2) The Project Manager shall be responsible for the implementation of this procedure in accordance with the NQAPM specified in the applicable SwRI Project Plan.
- (3) The Inspection Engineer shall be responsible for implementing the requirements of and ensuring compliance with this procedure.
- (4) The Manager of the Support and Administration Section, Quality Assurance Systems and Engineering Division, shall be responsible for storage of records generated in accordance with this procedure.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

X-FE-101-2

November 1982

Page 3 of 6

4. PROCEDURE

4.1 Original Data Sheets

- (1) Original data sheets, are to be serialized either at SwRI or at the site.
- (2) Original data sheets shall be filled out at the examination location and during the examination time.
- (3) The filled-out original data sheets shall be returned to the team staging area (office, trailer, etc.) on a periodic basis (at meal time, at the end of the day, upon leaving controlled areas) during an ISI or a PSI, and an entry shall be made into a daily log indicating that the examinations have been performed.
- (4) The original data sheets shall then be placed into the To-Be-Reviewed File.
- (5) The review process is performed as follows:
 - (a) The original data sheets shall be checked for completeness, accuracy, and consistency of the data.
 - (b) If clarification or correction of any entry on the original data sheets is required, the original data sheets shall be returned to the examiner.
 - (c) After clarifications or corrections, if any, have been made and initialed by the examiner, the reviewer shall sign each original data sheet which does not contain indications requiring evaluation/resolution.
- (6) The original data sheets which have been reviewed and signed shall be moved to the To-Be-Summarized File. See Paragraph 4.1(9).
- (7) Original data sheets which contain indications requiring evaluation/resolution shall be placed in the To-Be-Resolved File.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

X-FE-101-2

November 1982

Page 4 of 6

- (a) Original data sheets in the To-Be-Resolved File which document visual or surface examinations shall be handled as follows:
 - (1) The Original data sheets shall be reviewed, signed by the reviewer, and used to generate a Customer Notification Form (CNF). (The CNF shall be completed according to NQAP 13-1.)
 - (2) Copies of original data sheets shall be made and attached to the CNF.
 - (3) A log shall be maintained of CNFs issued and their status.
 - (4) The original data sheets are then placed in the To-Be-Summarized File. See Paragraph 4.1(9).
- (b) Original data sheets in the To-Be-Resolved File which document ultrasonic examinations shall be used to resolve the indications according to Paragraph 4.3 and shall then be processed as specified in Paragraphs 4.1(5) and 4.1(6).
- (8) When a computer is used to record results and generate summary sheets, data shall be fed into the computer. The computer will generate the summary sheets at the completion of all required examinations of an examination area.
- (9) If the computer is not used to generate summary sheets, data placed in the To-Be-Summarized File shall be summarized according to Paragraph 4.2 and filed with the summary sheet in the original data volumes.

4.2

Summary Sheets

- (1) Summary sheets, are to be serialized either at SwRI or at the site.
- (2) Summary sheets shall be completed for each examination area. In certain cases (studs, nuts, etc.), one summary sheet may be used for more than one examination area.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

X-FE-101-2

November 1982

Page 5 of 6

- (3) Summary sheets shall be completed prior to the conclusion of site activities for each examination area for which examination requirements have been completed.
- (4) Summary sheets shall be filed with the data in the original data volumes.

4.3 Resolution Sheets

- (1) Resolution sheets, are to be serialized either at SwRI or at the site.
- (2) The Level II or Level III examiner shall take the steps necessary to resolve the ultrasonic indications and complete a resolution sheet describing the results of his analysis. Any additional documentation required to support the resolution shall be attached.
- (3) Original data sheets and resolution records with indications requiring no further action shall be placed in the To-Be-Reviewed File and processed as specified in Paragraphs 4.1(5) and 4.1(6).
- (4) Data with indications requiring further action shall be handled in a manner established by the Director of the Department of Engineering Services.

4.4 Strip Charts, Magnetic Tapes, Video Tapes

- (1) Strip charts, magnetic tapes, and video tapes being generated during mechanized ultrasonic examinations shall be identified with a sequence number and with the examination areas for which they contain data.
- (2) During the resolution of any indications, the strip charts and tapes may be used by the Level II or Level III examiner, as needed.
- (3) The strip charts and tapes are then prepared for transmittal to SwRI.

5. RECORDS

- 5.1 Prior to departing the site at the completion of a preservice or inservice examination, the original data package with the exception of strip charts, magnetic tapes, and video

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

X-FE-101-2

November 1982

Page 6 of 6

tapes shall be reproduced and a copy(ies) shall be transmitted to the appropriate site personnel. At no time will data be reproduced for this transmittal before the required examinations for a particular area are complete, the data has been reviewed, and the summary sheets have been completed.

- 5.2 After completion of site activities (or at other times deemed appropriate by the Inspection Engineer or Team Supervisor), the original data package shall be transmitted to SwRI in accordance with the latest revision of SwRI Nuclear Projects Operating Procedure XVII-AG-101.



**SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE**

XIII-AG-101-2
September 1982
Page 1 of 12

Title

CONTROL OF NUCLEAR INSPECTION EQUIPMENT AND MATERIALS

EFFECTIVITY AND APPROVAL

Revision 2 of this procedure became effective on 10/4/82. This procedure consists of the pages and changes listed below.

<u>Page No</u>	<u>Change</u>	<u>Date Effective</u>
1-12	0	September 1982

SA

CK

Approvals

Written By	Date	Technical Review	Date
<i>Billy L. Hupfman</i>	<i>23 Sep 82</i>	<i>Edwin H. Hupfman</i>	<i>23 Sep 82</i>
Manager of Q.A.	Date	Cognizant Director	Date
<i>Samuel Malachuk</i>	<i>29/82</i>	<i>R. Trujillo</i>	<i>4 Oct 82</i>



CONTROL OF NUCLEAR INSPECTION EQUIPMENT AND MATERIALS

1. PURPOSE

- 1.1 The purpose of this operating procedure is to provide control for the storage, inventory, issue, shipment, and return to stock of examination equipment and materials.

2. SCOPE AND APPLICATION

- 2.1 The scope of this procedure is the control of nuclear examination equipment to ensure the integrity of equipment and materials used during the examination of nuclear power plant components. See NPOP VII-AG-102 for control of Search Units.
- 2.2 Controls are further required to ensure that maximum utilization is made of available equipment, i.e., equipment is not "lost" in the Radiation Control facility, delayed or misplaced during transit from job site to maintenance shops, or allowed to remain out of circulation for long periods of time while being used for research and development projects. The flow chart illustrates the control and process of nuclear inspection equipment (Attachment 1).
- 2.3 This procedure is applicable to, but not limited to, control of the following equipment and materials:
- (1) Ultrasonic Examination Materials and Equipment
 - (2) Plastic Wedges
 - (3) Penetrant Examination Materials
 - (4) Magnetic Particle Examination Materials and Equipment
 - (5) Eddy Current Examination Equipment and Standards
 - (6) Mechanized Examination Equipment
 - (7) Data Acquisition Systems
- 2.4 The following documents form a portion of this procedure as applicable.
- 2.4.1 SwRI Nuclear Quality Assurance Program Manual (NQAPM).
 - 2.4.2 SwRI Radiological Health and Safety Manual.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 3 of 12

3. RESPONSIBILITY

- 3.1 The Vice President of the Quality Assurance Systems and Engineering Division shall designate one or more secure areas to be used for equipment and materials storage as control facilities.
- 3.2 Control facilities shall be operated by a Stock Clerk and an Equipment Clerk. The Stock Clerk will be under the supervision of Inventory Control Traffic Manager who will be responsible for inventory storage and issue of examination materials. The Equipment Clerk, under the supervision of the Supervisor, Administration Control, will be responsible for inventory, storage, issue and retrieval of controlled equipment.
- 3.3 Responsible users, such as Team Supervisors, shall be responsible for compiling a list, using SwRI Form SS-17 Equipment Control/Shipping List (Attachment 2), of equipment and materials required for each job or project. They shall be responsible for shipment of the equipment to the job site, security while at the job site, reshipment upon completion of the job, documentation of faulty equipment, and turn-in of equipment and unused materials.
- 3.4 The Division Health Physicist or his representative shall be responsible for accepting equipment and materials returned from an in-service examination, its decontamination, and returned to its proper storage facility.
- 3.5 The Assistant Manager, Technical Activities Group, or his alternate shall be responsible for providing minimum maintenance turnaround time and for providing current certifications as required for nuclear examination equipment.

4. PROCEDURE

4.1 New Equipment

- 4.1.1 Newly purchased or fabricated critical equipment shall be inspected in accordance with SwRI Operating Procedure VII-AG-101 prior to being routed to the appropriate control facility.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 4 of 12

- 4.1.2 An identification number (serial number) will be assigned to noncapital equipment which does not have a manufacturer's serial number.
- 4.1.3 Upon completion of proper identification, new equipment will be listed on the control facility inventory records.
- 4.1.4 Once new equipment is properly identified and inventoried, it will be issued to the appropriate maintenance facility for an operational check and certification in accordance with NQAPM Procedure NQAP 10-1. The maintenance facility will return the equipment, along with copies of certifications generated, to the control facility. The new equipment may then be issued for nuclear inspection work.

4.2 Equipment and Materials Issue

- 4.2.1 When it is determined that equipment and/or materials are to be removed from the appropriate control facility, with the exception of equipment routed through the maintenance facilities (Paragraph 4.6.3), the Team Supervisor or Responsible User will compile a list of required equipment and materials needed using Form SS-17. The responsible supervisor shall complete each blank at the top portion of the form with no exceptions. On the second part of the form, he will list quantity and nomenclature of each item of equipment or materials required and indicate those which require certifications.
- 4.2.2 When the Team Supervisor or Responsible User has initiated Form SS-17, he may assign any technician to draw and pack the equipment. The technician will present Form SS-17 to the appropriate control facility, and the Clerk will issue the material or equipment. The Clerk will enter appropriate serial number and estimated replacement cost of each item on Form SS-17 as the equipment is issued. He will also supply copies of appropriate certifications as required.
- 4.2.3 When requested equipment and materials have been issued, the technician will sign each Form SS-17, indicating that he has received the items for the responsible supervisor, and shall notify the QA Section so they can review the equipment and certifications.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 5 of 12

4.2.4 The Equipment Clerk will distribute Form SS-17 as follows:

- (1) Copy 1 (white): Forward to the Division Shipping Agent
- (2) Copy 2 (yellow): Give to the person receiving the equipment
- (3) Copy 3 (pink): Retain for control purposes
- (4) Copy 4 (goldenrod): Will be given to QA when QA inspection is required. If a QA inspection is not required, this copy will be destroyed.

4.3 Equipment Packing and Shipping

- 4.3.1 If the equipment and/or materials are to be shipped from the Institute grounds, the technician will pack each item in numbered shipping containers. He will then enter the container number in the appropriate Box No. space on Form SS-17.
- 4.3.2 If the equipment is to be shipped by freight, a box count must be made and each box must be weighed. Shipping labels must be completed and affixed to each shipping container.
- 4.3.3 When the packing has been completed, the technician will return Copy 2 of Form SS-17 to the responsible supervisor who retains this copy for accountability of equipment while in his possession.
- 4.3.4 If equipment is to be shipped by freight, the responsible supervisor will contact the Requisitioning Agent, who will arrange for shipping and for the proper shipping documents to be completed.
- 4.3.5 The responsible supervisor will review Form SS-17, with special emphasis placed on ensuring that appropriate certifications are available for each item that requires certification.

4.4 Onsite Control

- 4.4.1 The Team Supervisor or Project Engineer shall assume responsibility for the security of equipment once it has been drawn from the control facility. At the job site, he will obtain a secure area to be used for equipment storage

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 6 of 12

and will arrange for issue of the equipment or materials as the work load demands. He will ensure that equipment placed into onsite storage after use is dry and clean and that any equipment damaged or found to be inoperative or out of tolerance is tagged with a Form SS-19, "Hold Tag", to indicate its condition (Attachment 3).

4.5 Decontamination

- 4.5.1 Equipment being returned from an inservice inspection must be delivered to a radiation control area immediately upon return to the Institute. This equipment will be controlled in accordance with SwRI Radiological Health and Safety Manual, Paragraph 5.2.

4.6 Equipment/Material Turn-in

- 4.6.1 Upon completion of a project or the return to the Institute of equipment used off the grounds, the equipment will be returned to the control facility. (See Paragraph 4.6.2 when returning from an inservice examination.) As each item is checked in, the Equipment Clerk will enter the date in the Date Returned block of copy 3 of the Form SS-17. He will also initial in the Date Returned block of copy 2 of the Form SS-17 when requested.
- 4.6.2 Expendable materials such as Penetrant Examination Material and Magnetic Particle Examination Materials will be returned to the stock room. When the Stock Clerk can determine that the material has not been used and identifying data is available to trace the material to the appropriate certificates and to the original purchase order, he will credit the appropriate job site by processing an appropriate store requisition.
- 4.6.3 Equipment and material being returned from an inservice examination must be delivered to a radiation control area immediately upon return to the Institute. The Health Physicist representative will inventory equipment and material and acknowledge responsibility for it. Equipment and material that is not contaminated or that is decontaminated will be returned to the appropriate storage facility according to 4.6.1 and 4.6.2 above. Equipment that cannot be decontaminated will be stored in the appropriate control area and the Health Physicist representative will inform the Assistant

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 7 of 12

Director, Engineering Services Division, and the Equipment Control Clerk in writing of the nomenclature and the serial number of the equipment, and the site the equipment came from.

4.6.4 The Equipment Clerk will check each item for disposition. Equipment requiring repair, cleaning, or recertification/recalibration within the next 30 calendar days will be taken to the appropriate maintenance facility.

4.6.5 When repair and/or certification is completed, the item will be returned to the control facility and placed in stock for reissue.

4.7 Special Issue Requirements

4.7.1 Occasionally it will be necessary for a Team Supervisor who is in the field to request that equipment be checked out and sent to him. When this circumstance arises, he will contact the Examination Activities Coordinator or his alternate and make his needs known. The Examination Activities Coordinator or his alternate will initiate Form SS-17 and draw, pack, and ship the equipment. He will perform the review and enclose Copy 2 of Form SS-17 in the shipping container so that the Team Leader will have a record of what was actually shipped.

4.7.2 If equipment is to be shipped from one job location to another without returning to the Institute, a packing list will be made using Form SS-17. One copy will be retained by the responsible person making the shipment, one copy will be enclosed with the shipment, and one copy will be returned to the control facility at the Institute. The responsible supervisor will review the Form SS-17 to ensure that certificates were included as required.

4.8 Lost or Destroyed Equipment

4.8.1 In the event any item other than normally consumable materials is lost or destroyed while it is signed out of the control facility, the responsible supervisor will initiate a memorandum addressed to the Assistant Director, Engineering Services Division, with a copy to the Manager of Support and Administration and the Supervisor, Administration Control. The memorandum will identify the equipment and describe the circumstances involved with its loss or destruction.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 8 of 12

4.9 Recall of Equipment for Recalibration

- 4.9.1 When notified that a particular piece of equipment is due recalibration, the Equipment Clerk will determine the location of the equipment by reviewing his equipment inventory records. If the equipment is located within the stock room, he will take the equipment to the appropriate certifying facility. When the equipment has been issued, he will notify the Assistant Manager, Technical Activities Group, or other responsible supervisor by completing a Form SS-42 (Attachment 4). The Activity Coordinator or responsible supervisor will ensure the equipment is sent to the Equipment Clerk on or before the recalibration date. The Equipment Clerk will then take it to the appropriate certifying facility.

Note: If a particular piece of equipment is being used in a non-critical application, it need not be returned until completion of the project.

5. RECORDS

- 5.1 Copy 3 of Form SS-17 shall be maintained by the control facility for a minimum of six months after the last item on the form was turned in.
- 5.2 SwRI Form SS-42 may be destroyed upon return of equipment to the stock room.
- 5.3 The Equipment Clerk will maintain a file of current equipment certification records. An adequate number of copies will be included for issue during equipment issue.

SOUTHWEST RESEARCH INSTITUTE

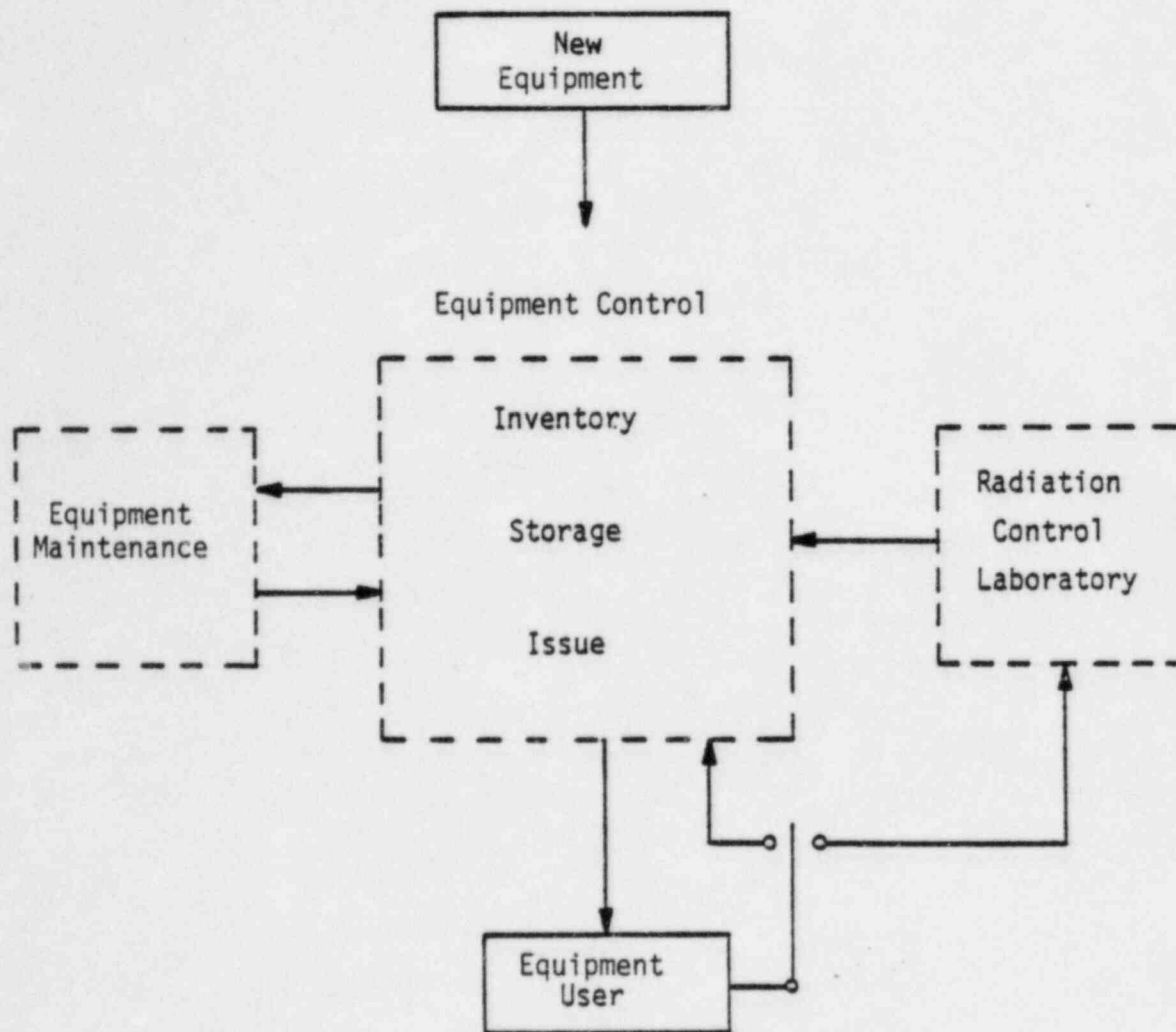


NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 9 of 12



Attachment 1

Page 10 of 12

SWR: FORM 88-17-2

SAMPLE FORM

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XIII-AG-101-2

September 1982

Page 11 of 12

HOLD

DO NOT USE

SwRI Form SS-19

REASON FOR HOLD

NAME _____

Attachment 3

SAMPLE FORM

Page 12 of 12

[illegible]

000000 000000 000 000000

Attachment 4
SAMPLE FORM



**SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE**

CHANGE 1

XVII-AG-101-1

June 1982

Page 1 of 7

Title

DATA STORAGE AND RETRIEVAL

EFFECTIVITY AND APPROVAL

Revision 1 of this procedure became effective on 2/10/81. This procedure consists of the pages and changes listed below.

<u>Page No</u>	<u>Change</u>	<u>Date Effective</u>
1	1	6/22/82
2	0	2/10/81
3	1	6/22/82
4-7	0	2/10/81

SA

CK

Approvals

Written By

Edmund R. Schumacher

Date

21 June 1982

Technical Review

Shirley H. Heller

Date

21 June 1982

Manager of Q.A.

R. Engelhardt for BEM

Date

6/21/82

Cognizant Director

R. Triguero

Date

22 June 82

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XVII-AG-101-1

January 1981

Page 2 of 7

DATA STORAGE AND RETRIEVAL

1.0 INTRODUCTION

1.1 Purpose

This procedure establishes a system for the control and the storage of data for nuclear power plant components classified by ANSI N45.2.9, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants." This operating procedure satisfies the requirements of Appendix B to 10CFR50, Criterion XVII and the SwRI Nuclear Quality Assurance Program Manual.

1.2 Scope and Application

- 1.2.1 The scope of this procedure is limited to the documentation of nuclear power plant examinations performed by NDE Field Services, Quality Assurance Systems and Engineering Division, and to other documentation as designated by the Vice President, Quality Assurance Systems and Engineering Division.
- 1.2.2 This procedure applies to the Data Control Clerk, Team Supervisors, Inspection Engineers, and all other personnel who enter documents into and receive them from the Data Storage Facility.
- 1.2.3 Other divisions of the Institute may store quality assurance records for nuclear power plants in the Data Storage Facility. Once these records have been entered in the facility, they will be controlled according to this procedure.

1.3 Responsibility

- 1.3.1 The Manager of Support and Administrative Services within the Quality Assurance Systems and Engineering Division shall be responsible for the implementation and control of this procedure.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

CHANGE 1

XVII-AG-101-1

June 1982

Page 3 of 7

- 1.3.2 The Data Control Clerk of Support and Administrative Services shall be responsible for controlling, filing, and maintaining documentation covered by this procedure in the Data Storage Facilities. The Data Clerk shall assume this responsibility when documents are received in accordance with Paragraphs 2.1, 2.2, and 2.3.
- 1.3.3 Team Supervisors, Inspection Engineers, and other personnel compiling documentation shall be responsible for ensuring completeness and accuracy of documentation being entered into the Data Storage Facility (see Section 2.0).
- 1.3.4 The Manager of Support and Administrative Services, or a representative, shall routinely review Section performance against the requirements of this procedure.
- 1.3.5 The Manager of Quality Assurance, or a designated representative, shall routinely audit performance against the requirements of this procedure and shall report the results of such audits to the Manager of Support and Administrative Services and the Vice President, Quality Assurance Systems and Engineering Division.

1.4 Data Storage Facility Description

The Data Storage Facility for SwRI-retained quality assurance records is located in Building 139. The construction of the facility in Building 139 is concrete block with steel vault door. The facility has a temperature control device to regulate temperature and humidity.

2.0 PROCEDURE

- 2.1 Examination data and related material being sent to SwRI will be listed on Form SS-1, Records Transmittal and Receipt. Upon completion of the form and its arrival with the data at the Institute, they will be delivered to the Data Control Clerk.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XVII-AG-101-1

January 1981

Page 4 of 7

2.2 Upon receipt of the data, the Data Control Clerk will use the transmittal form as a checklist to ensure that all material listed has been received. The Data Clerk will inventory the data by preparing a listing of Summary Sheet numbers or by entering the Summary Sheet number on a weld table. The Data Clerk will also ensure that each Examination Data Sheet listed on each Summary Sheet is in the Data Package. In those cases where a Summary Sheet is not used or has not been prepared at the time of receipt of the data, the Data Clerk will prepare a listing showing the serialized number of each data sheet received. The completed inventory will be filed in Section A of the file system. In addition, the Data Control Clerk will ensure that all documentation to be stored contains the following:

- (1) Reactor Site Name
- (2) Date of Record Entry
- (3) Description of Material. Analog and video tapes and strip charts will identify the examination to which they relate and will be numbered. This information is entered by the Team Supervisor, the Inspection Engineer, or their designated alternates.

The Data Control Clerk will then enter the data into the Data Storage Facility.

- 2.3 PSI and ISI reports, other nuclear power plant examination reports, examination plans, etc., relating to a particular reactor will be furnished to the Data Control Clerk by the Report Coordinator.
- 2.4 Other records designated by the Vice President, Quality Assurance Systems and Engineering Division, as authorized for storage in the Data Storage Facility, will be furnished to the Data Control Clerk.
- 2.5 Items being removed from the Data Storage Facility shall be signed out. Original field data will be returned to the Data Storage Facility at the end of each day. If this data needs to be used after normal working hours, special arrangements will be made with the Data Control Clerk. Other items may be signed out for the period required. The individual withdrawing data or other material shall be responsible for its safekeeping and return.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XVII-AG-101-1

January 1981

Page 5 of 7

- 2.6 The Data Storage Facility will be maintained in a neat and orderly manner. Records will be inside file cabinets or bookcases. Loose papers, drawings, etc., shall be placed in folders, binders, or envelopes for filing.

3.0 RECORDS

- 3.1 The Data Control Clerk will maintain an up-to-date list of records covered by this procedure and a list of their respective locations.
- 3.2 Data maintained in the Data Storage Facility will be retained for the periods indicated in Appendix A or according to written instructions furnished to the Data Control Clerk at the time the records are placed into the Data Storage Facility. The period of retention will in no circumstances be shorter than the time specified in the applicable contract.
- 3.3 Project Managers should review the records in the Data Storage Facility relating to closed projects to determine their ultimate dispositioning; i.e., return of records to client upon termination of contract, continuous storage in the Data Storage Facility, etc. Decisions should be coordinated with the appropriate Director, and the Data Control Clerk should be notified in writing. The Data Control Clerk will comply with the written instructions.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XVII-AG-101-1

January 1981

Page 6 of 7

APPENDIX A

The following is a list of documentation and its retention periods as maintained by Data Control in the Data Storage Facilities.

<u>Record Type</u>	<u>Retention Period</u>
(1) PSI, ISI, and other examination reports, which include: Personnel certifications Search unit, material, and instrument certifications Zero reference location Weld identification isometric drawings Calibration standards Nondestructive testing procedures	Lifetime
(2) PSI, ISI, and other examination data, which include: Original data Video tapes Analog tapes Eddy current data Eddy current tapes Strip charts Equipment calibration sheets	Lifetime
<u>Record Type</u>	<u>Retention Period</u>
(3) PSI, ISI, and other examination plans	Lifetime
(4) Photographs relating to nuclear power plants	As determined by the Project Manager
(5) Logs, drawings, and summaries created by field crews during an ISI or PSI	Lifetime
(6) General information that would be of value in conducting future ISIs	Lifetime

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

XVII-AG-101-1

January 1981

Page 7 of 7

- | | |
|---|---|
| (7) Copies of procedures; personnel, material, and instrument certifications; and other report data | Destroy 6 months after issuance of Final Report |
| (8) Other general information that will not provide valuable information in conducting future ISIs | Destroy after 2 years |

APPENDIX B

SOUTHWEST RESEARCH INSTITUTE
NONDESTRUCTIVE TESTING PROCEDURE

APPENDIX B

SOUTHWEST RESEARCH INSTITUTE
NONDESTRUCTIVE TESTING PROCEDURE

Table of Contents

<u>Procedure No./Rev.</u>	<u>Title</u>
SwRI-NDT-900-7/6	Visual Examination of Nuclear Reactors



**SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE**

SwRI-NDT-900-7
Revision 6
November 1983

Page 1 of 7

Title

VISUAL EXAMINATION OF NUCLEAR REACTORS

EFFECTIVITY AND APPROVAL

Revision 6 of this procedure became effective on 11-18-83. Other revisions of the base document may be effective concurrently.

SA
[Signature]

Approvals

Written By <i>DW Fournell</i>	Date <i>11/14/83</i>	Technical Review <i>[Signature]</i>	Date <i>11/15/83</i>
Manager of Q.A. <i>[Signature]</i>	Date <i>11/15/83</i>	Co-Managing Director <i>Wayne J. Hach</i>	Date <i>11/16/83</i>

The following information may be used for convenience. Completion of this portion is not mandatory.

Revision No.								
Date Effective								
Procedure Section(s) Affected								

Notes:

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 6
November 1983

Page 2 of 7

VISUAL EXAMINATION OF NUCLEAR REACTORS

SwRI-NDT-900-7

1. PURPOSE

This procedure provides the technical information and detailed steps required to ensure the proper visual examination of nuclear power plants in accordance with the applicable ASME Boiler and Pressure Vessel Codes.

2. SCOPE AND APPLICATION

Direct and remote visual techniques shall be applied as specified for the examination of:

- (1) Nuclear power plant components
- (2) Nuclear reactor internals
- (3) Support members and structures for piping, valves, and pumps

3. APPLICABLE DOCUMENTS

- (1) ASME Boiler and Pressure Vessel Code, Section XI, 1980 Edition with Addenda through Winter 1980, "Rules for Inservice Inspection of Nuclear Power Plant Components"
- (2) SwRI Nuclear Quality Assurance Program Manual (NQAPM)

3.1 Applicable Examination Record

SwRI-NDTR Form No. 17-28, revision dated 07-30-80

4. RESPONSIBILITY

- (1) The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, shall be responsible for the preparation, review, approval, and control of this procedure.
- (2) The Project Manager shall be responsible for the implementation of this procedure in accordance with the NQAPM specified in the applicable SwRI Project Plan.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 6
November 1983

Page 3 of 7

- (3) The examiner shall be responsible for implementing the requirements of this procedure.
- (4) The Manager of the Support and Administration Section, Quality Assurance Systems and Engineering Division shall be responsible for storage of records generated in accordance with this procedure.

5. PERSONNEL AND EQUIPMENT

5.1 Personnel Certification

Personnel performing examinations shall be certified in accordance with SwRI NQAP 11-2, "Procedure For Certifying Visual Examination Personnel."

5.2 Equipment

The Visual Examination Acceptability Test Card shall be made from Kodak Neutral Test Card No. R-27 or an equivalent, with an 18% neutral grey side having a 1/32-inch-wide black line across its center.

Commercially available equipment shall be used as required for the performance of examinations or operations by the techniques described in Paragraphs 6.1, 6.2, 6.3, and 6.4.

6. EXAMINATION METHODS

6.1 VT-1 Examinations

The examiner shall determine the condition of the part, component, or surface with respect to cracks, wear, corrosion, erosion, or physical damage to the surface of the part or component.

6.1.1 Direct Visual

Direct visual examination shall be performed by placing the eye within 24 inches of the surface to be examined and at an angle no less than 30 degrees with the surface to be examined. Mirrors may be used to improve the angle of vision, and aids such as magnifying lenses may be used.

In addition to the general lighting, illumination of the area to be examined shall be provided at right and oblique angles to expose cracks or evidence of corrosion or erosion.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 6
November 1983

Page 4 of 7

Resolution shall be considered adequate when the combination of access, lighting, and angles of vision, either unaided or corrected, can resolve a 1/32-inch-wide black line on an 18% neutral grey card placed on the surface to be examined.

6.1.2 Remote Visual Technique

Remote visual examination may be used where conditions exist that do not permit direct visual examination. Remote visual examination may include visual aids such as telescopes, periscopes, borescopes, fiber optics, or video cameras and monitoring systems, with or without attachments for permanent recording. Remote techniques shall demonstrate the ability to provide a resolution at least equivalent to that obtainable by direct visual examination. Mirrors, movable lights, or rotating optics, or any combination thereof, may be employed to display cracks, surface scratches, or evidence of corrosion, erosion, misalignment, or movement. Scanning parameters, if required, for the remote visual examination shall be included in the applicable SwRI Scan Plan.

Resolution shall be considered adequate when the combination of access, lighting, and angles of vision, either unaided or corrected, can resolve a 1/32-inch-wide black line on an 18% neutral grey card placed on the surface to be examined or in a situation similar to the area to be visually examined.

6.2 VT-2 Examinations

The examiner shall locate evidence of leakage from pressure-retaining components, or abnormal leakage from components with or without leakage collection systems as required during system pressure or functional tests.

6.2.1 Noninsulated Components

The accessible external exposed surfaces of pressure retaining components shall be examined for evidence of leakage.

Examination of the surrounding area, including the floor or equipment located underneath the component, shall be required for components with inaccessible external surfaces.

6.2.2 Insulated Components

Examinations may be conducted without the removal of insulation by examining the accessible exposed surfaces and joints of the insulation. Vertical surfaces of insulation need to be examined only at the lowest elevation where leakage may be detectable. Horizontal surfaces of insulation shall be examined at each insulation joint.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 6
November 1983

Page 5 of 7

Inaccessible piping and components shall require an examination for evidence of leakage on the surrounding floor areas, equipment surfaces located underneath the component, or other areas where leakage may be channeled.

Discoloration or residue on surfaces examined shall be given particular attention to detect possible boric acid accumulations from borated reactor coolant leakage.

6.3 VT-3 Examinations

The examiner shall determine the general mechanical and structural conditions of components and their supports, such as the presence of loose parts, debris or abnormal corrosion products, wear, cracks, erosion, corrosion, and the loss of integrity at bolted or welded connections.

6.3.1 Vessel Internals

The areas to be examined shall include major load-bearing elements of the reactor internals which are relied upon to retain the core structure in position; the lateral, vertical, and torsional restraints within the reactor vessel; the locking and bolting devices whose failure could adversely affect the structural integrity of the internals; surfaces that are known to be or may become contact surfaces during operation; critical locations on reactor internal components as identified from the vibration analyses; and the interior of the reactor vessel for evidence of loose parts or foreign material.

6.4 VT-4 Examinations

This examination shall be performed to determine conditions relating to the operability of components or devices such as mechanical and hydraulic snubbers, component supports, pumps, valves, spring-loaded hangers and constant supports. Functional adequacy, verification of settings, or freedom of motion shall be determined.

The support settings of constant and variable spring-type hangers, snubbers, and shock absorbers shall be recorded in the REMARKS section of the SwRI Visual Examination Record.

The scale reading of hangers having calibrated load indicators shall be recorded in the REMARKS section of the SwRI Visual Examination Record.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 6
November 1983

Page 6 of 7

Hydraulic snubbers shall be examined for signs of fluid leakage at shaft seals, joints, and couplings. Shaft extensions shall be examined for scratches, cuts, and gouges.

Hanger springs shall be examined for integrity to ensure that springs have not sheared.

Pipe clamps and U-bolts shall be examined to ensure that they are securely attached to the pipe.

7. Examination

7.1 Surface Cleaning

Visual examinations which require clean surfaces or decontamination for valid interpretation of results shall be preceded by appropriate cleaning processes.

Examinations may be required where the surface is painted or has other types of coatings. This shall be permitted if it is determined that such coatings do not interfere with valid interpretation of results.

7.2 Examination Areas

Components, parts, and areas to be examined shall be as specified in the applicable SwRI Examination Plan. Remote visual examinations utilizing mechanized scanning devices shall be as specified in the applicable Scan Plan. Scanning parameters, if required, for the remote visual examination, shall be included in the applicable SwRI Scan Plan.

8. RECORDING CRITERIA

Indications shall be recorded in accordance with the techniques outlined in the applicable revision of SwRI Nuclear Projects Operating Procedure IX-FE-116 for direct visual examinations. Indications detected in remote visual examinations shall be recorded in accordance with the customer's specifications, remote equipment manufacturer's specifications, or the SwRI Scan Plan, if applicable.

Visual abnormalities shall be recorded on the SwRI Visual Examination Record and reported to the customer.

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 6
November 1983

Page 7 of 7

9. EVALUATION

Evaluation of reportable indications shall be the responsibility of the customer, or the customer's representative, and shall be conducted in accordance with Article IWA-3000, Section XI, of the applicable ASME Boiler and Pressure Vessel Code.

10. RECORDS

The customer shall receive copies of documents generated in accordance with this procedure in the examination report.

Documents generated in accordance with this procedure shall form a part of the examination report which shall be stored by the Manager of the Support and Administration Section, Quality Assurance Systems and Engineering Division, in the Data Storage Facility for the period specified by the contractual agreement with the customer.

APPENDIX C

CERTIFICATES OF PERSONNEL QUALIFICATIONS

APPENDIX C

CERTIFICATES OF PERSONNEL QUALIFICATIONS

Table of Contents

<u>Personnel</u>	<u>VT</u>	<u>Page</u>
Magaro, S.	II	C-1
Shinkus, R. P.	III	C-2
Wardwell, J. B.	II	C-3



SOUTHWEST RESEARCH INSTITUTE
NONDESTRUCTIVE EXAMINATION
STATEMENT OF CERTIFICATION

The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, certifies that Steve Magaro is qualified as Level II in Visual Testing (VT), categories VT-1, VT-2, VT-3, VT-4 in accordance with the requirements of SwRI Nuclear Quality Assurance Procedure 11-2, Revision 2.

Certification Limitations: None Certification valid only while employed by SwRI

Expiration Date: 08/24/84

Signed: Walter J. Flach
Director, Department of Engineering Services

Date: 8/24/81

EDUCATION, TRAINING AND EXPERIENCE HISTORY

EDUCATION:	NAME	YEARS	DEGREE
High School	Robert E. Lee (Tx)	3	GRAD
Additional	St. Philip's College	3	NO
Major Field of Study	Welding		

TRAINING (this method and level):

Date Completed: 06/24/81
Hours: 12 Location: SwRI

Date Employed by SwRI: 01/22/79

The individual has been credited with 7 months of experience in this examination method on the date of certification. Some of the experience may have been accrued simultaneously with other NDE methods (at least 25% was in this method).

Previous NDE experience (if used for qualification):

Company	From	To
None		

VISUAL ACUITY AND COLOR PERCEPTION

The individual is capable of reading Jaeger Number 1 letters at 12 inches, and is capable of reading Snellen Number 30 letters at a distance of 20 feet, in at least one eye (using corrective lenses if specified below), and can distinguish and differentiate contrast between colors used in this method.

Date	Corr. Req.	Verified by
08/06/81	No	Heidi Gutierrez <i>HG</i>
07/22/82	No	Heidi Gutierrez <i>HG</i>
07/05/83	No	Heidi Gutierrez <i>HG</i>

Date	Corr. Req.	Verified by

MOST RECENT EXAMINATION GRADES

CERTIFICATION HISTORY: THIS LEVEL

	Scores	Weight
General:	97.50	.33-1/3
Specific:	96.00	.33-1/3
Practical:	88.25	.33-1/3
Composite:	93.92	1.00

	Date
Initial Certification:	08/24/81
Recertification:	
Recertification:	
Recertification:	
Recertification:	
Recertification:	

Date: 06/23/81; 06/24/81

Responsible Level III: J.G. Godwin *J.G. Godwin*

REMARKS



SOUTHWEST RESEARCH INSTITUTE
NONDESTRUCTIVE EXAMINATION
STATEMENT OF CERTIFICATION

The Vice President, Quality Assurance Systems and Engineering Division, certifies that Robert P. Shimkus
is qualified as Level III in Visual Testing (VT), categories Vt-1, VT-2, VT-3, VT-4
in accordance with the requirements of SwRI Nuclear Quality Assurance Procedure 11-2, Revision 2.
Certification Limitations: None Certification valid only while employed by SwRI

Expiration Date: 09/02/84

Signed: [Signature]
Vice President, Quality Assurance Systems and Engineering Division

Date: 8 Sept 81

EDUCATION AND EXPERIENCE HISTORY

EDUCATION:	NAME	YEARS	DEGREE
High School	Marcellus H.S. (Mich)	4	GRAD
Additional	Michigan State Univ.	4	B.S.
Major Field of Study	Metallurgical Engineering		

Previous NDE experience (if used for qualification):

Company	From	To
Republic Steel Corp.	1948	1952
Goodyear Aircraft Corp.	1952	1953
Craft Metal Fabricating Co.	1953	1955
Goodyear Aerospace Corp.	1958	1968
Westinghouse Electric	1968	1970

ate Employed by SwRI: 01/06/70 The individual has been credited with at least 396 months of experience
in this examination method on the date of certification. Some of the experience may have been accrued simultaneously with other NDE methods (at
least 25% was in this method).

VISUAL ACUITY AND COLOR PERCEPTION

The individual is capable of reading Jaeger Number 1 letters at 12 inches, and is capable of reading Snellen Number 30 letters at a distance of 20 feet, in
at least one eye (using corrective lenses if specified below), and can distinguish and differentiate contrast between colors used in this method.

Date	Req.	Verified by
10/03/80	Yes	Heidi Gutierrez <u>kg</u>
09/23/81	Yes	Heidi Gutierrez <u>kg</u>
05/18/82	Yes	Heidi Gutierrez <u>kg</u>

Date	Req.	Verified by
05/23/83	Yes	Heidi Gutierrez <u>kg</u>

MOST RECENT EXAMINATION GRADES

	Scores	Weight
General:	88.05	0.5
Specific:	92.22	0.5
Practical:	N/A	N/A
Composite:	90.14	1.0

Date: 05/15/81
Responsible Level III: [Signature]
W. J. Zentheiser

CERTIFICATION HISTORY: THIS LEVEL

	Date
Initial Certification:	01/02/74
Recertification:	01/02/77
Recertification:	01/02/80
Recertification:	09/02/81
Recertification:	
Recertification:	

REMARKS



SOUTHWEST RESEARCH INSTITUTE
NONDESTRUCTIVE EXAMINATION
STATEMENT OF CERTIFICATION

The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, certifies that James Wardwell is qualified as Level II in Visual Testing (VT), categories VT-1, VT-2, VT-3, VT-4 in accordance with the requirements of SwRI Nuclear Quality Assurance Procedure 11-2, Revision 2.

Certification Limitations: None Certification valid only while employed by SwRI

Expiration Date: 08/24/84

Signed: Wayne J. Hark
Director, Department of Engineering Services

Date: 8/24/81

EDUCATION, TRAINING AND EXPERIENCE HISTORY

EDUCATION:	NAME	YEARS	DEGREE
High School	<u>Thomas Jefferson (Tx)</u>	<u>4</u>	<u>GRAD</u>
Additional:			
Major Field of Study			

TRAINING (this method and level):

Date Completed: 06/24/81
Hours: 12 Location: SwRI

Date Employed by SwRI: 09/05/79

The individual has been credited with 11 months of experience in this examination method on the date of certification. Some of the experience may have been accrued simultaneously with other NDE methods (at least 25% was in this method).

Previous NDE experience (if used for qualification):

Company	From	To
<u>None</u>		

VISUAL ACUITY AND COLOR PERCEPTION

The individual is capable of reading Jaeger Number 1 letters at 12 inches, and is capable of reading Snellen Number 30 letters at a distance of 20 feet, in at least one eye (using corrective lenses if specified below), and can distinguish and differentiate contrast between colors used in this method.

Date	Corr.	Req.	Verified by	Date	Corr.	Req.	Verified by
<u>04/30/81</u>	<u>Yes *</u>		<u>Heidi Gutierrez</u>	<u>01/11/84</u>	<u>No(near)</u>	<u>Yes(far)</u>	<u>Heidi Gutierrez</u>
<u>03/12/82</u>	<u>No(near)</u>		<u>Yes(far) Heidi Gutierrez</u>				
<u>01/17/83</u>	<u>No(near)</u>		<u>Yes(far) Heidi Gutierrez</u>				

MOST RECENT EXAMINATION GRADES

	Scores	Weight
General:	<u>77.50</u>	<u>.33-1/3</u>
Specific:	<u>70.00</u>	<u>.33-1/3</u>
Practical:	<u>94.00</u>	<u>.33-1/3</u>
Composite:	<u>80.50</u>	<u>1.00</u>

Date: 06/23/81; 06/24/81

Responsible Level III: J.G. Godwin

CERTIFICATION HISTORY: THIS LEVEL

	Date
Initial Certification:	<u>08/24/81</u>
Recertification:	
Recertification:	
Recertification:	
Recertification:	
Recertification:	

REMARKS

*For far vision only

APPENDIX D

NUCLEAR REGULATORY COMMISSION
INSPECTION AND ENFORCEMENT BULLETIN NO. 80-13

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

SSINS No.: 6820
Accession No.:
8002280661

May 12, 1980

IE Bulletin No. 80-13

CRACKING IN CORE SPRAY SPARGERS

Description of Circumstances:

Instances of cracking in core spray spargers have occurred at two BWR facilities. This trend indicates a need for more intensive inspection of these components during subsequent refueling outages.

Oyster Creek Nuclear Generating Station

Jersey Central Power and Light Company notified the NRC on October 18, 1978, that a crack had been found in Core Spray Sparger System II during remote visual inservice inspection at their Oyster Creek Nuclear Generating Station. The crack was located at 208° azimuth and extended at least 180° circumferentially around the sparger. An evaluation of the event by the licensee postulated that deformation of the sparger had occurred during fabrication and installation which led to cracking by Intergranular Stress Corrosion Cracking (IGSCC) during service in the BWR environment. A temporary repair was effected by installing a clamp assembly over the crack. The licensee's analysis indicated that the crack had relieved the stresses present and therefore precluded further cracking. The NRC safety evaluation permitted operation until the next refueling outage and required inspection of the sparger at that time.

The NRC was informed by the Jersey Central Power and Light Company on January 16, 1980 that further cracking was discovered in the core spray spargers during an inservice inspection conducted in conjunction with the refueling outage. A total of twenty-eight cracks 0.001 to 0.002 inches in width and of varying lengths were identified in both core spray spargers. The licensee stated that they believed the majority of additional cracks were present earlier and not discovered during the 1978 inspection due to inspection equipment limitations. Near term repair consisted of the application of nine additional clamp assemblies in areas of the spargers where cracks were visually observed on the accessible portion of the sparger and UT indications were present in the inaccessible portion of the sparger and in the junction box region. The licensee analyzed the flow characteristics of the spargers and determined that adequate flow distribution would be maintained if thru wall cracking .005 inches wide and 180° in length were present. The licensee stated that the installation of the clamps would assure the sparger would maintain its physical integrity and remain in place.

The repair measures proposed were determined by the NRC to be adequate until the following refueling outage. The NRC evaluation stated that actions should be taken to develop and install an improved replacement system at the following refueling outage.

Pilgrim Nuclear Power Station

On January 31, 1980 the Boston Edison Company (BECo) informed the NRC that five indications in the upper core spray sparger and two indications on the lower core spray sparger at the Pilgrim Nuclear Power Station were identified during remote visual inservice inspections. The indications were confirmed as cracks after hydrolasing and brush cleaning. The licensees evaluation indicated that the sparger will retain structural integrity throughout the next cycle, although core spray flow distribution may be affected due to through-wall cracks. However, core spray flow delivery to the shroud interior would not be expected to decrease. A loose parts analysis was presented which addressed (1) corrosion, (2) flow blockage, and (3) control rod interference.

To support power operation in Cycle 5 with the core spray sparger in its present condition, BECo has reanalyzed ECCS taking credit only for core spray reflood, taking no credit for core spray heat transfer. The submission by BECo is currently under review by the staff. The analysis is expected to cover a full spectrum of core spray failures. It is expected that the limiting condition will be the failure of recirculation suction line. A MAPLHGR limit reduction will likely be imposed during Cycle 5 to compensate for the assumption of no core spray heat transfer.

Based on results from other sparger inspections and previous pipe cracking experience, cold work and sensitization during fabrication and installation stresses are considered to be the major factors in causing the observed cracks at the Pilgrim Station. The cracks are hypothesized to be initiated and propagated by intergranular stress corrosion (IGSCC).

A meeting was held with representatives from GE in Bethesda, Maryland on March 13, 1980 to discuss core spray sparger cracking at BWRs. At the meeting GE provided the following information:

1. In February 1979, GE issued to BWR licensees Service Information Letter (SIL) No. 289 that recommended inspection of the core spray spargers for visual indications of cracking. To date, 19 of 21 plants inspected have no observed cracking. Cracks have been found at 2 facilities (Pilgrim and Oyster Creek).
2. The key contributors to IGSCC vary from plant-to-plant, although stresses from cold work and sensitization during fabrication and installation are considered prime factors leading to IGSCC at Pilgrim and Oyster Creek. Because the cause of cracking is not yet confirmed by metallurgical analysis, GE is developing tooling to extract sparger samples to verify the postulated cracking mechanism.

3. GE is evaluating methods of improving the sparger inspection techniques, and is considering a modification to the SIL, if warranted.

The staff agreed that improved inspection techniques should be developed and metallurgical examinations should be performed to determine the mode of failure. The staff asked GE to keep them informed of progress in these areas.

Actions to be Taken by Licensees:

For all boiling water power reactor facilities with an operating license:

1. At the next scheduled and each following refueling outage until further notice, perform a visual inspection of the Core Spray Spargers and the segment of piping between the inlet nozzle and the vessel shroud. Remote underwater TV examinations are acceptable if adequate resolution can be demonstrated. The viewing in situ of 0.001 in. diameter fine wires is considered as an acceptable means of demonstrating suitable resolution of the TV examinations. Such techniques as the use of oblique lighting, and the ability to light from each side independently are considered useful in enhancing the image of cracks to facilitate detection.
2. In the event cracks are identified during examination of the core spray sparger system, the location and extent of the indications shall be recorded and reported to the NRC. Supplementary examinations using volumetric methods may be performed to aid in characterizing the extent of cracking in nonvisible locations. An evaluation shall be submitted to NRR for review and approval prior to return to operation.
3. Any cracking identified in the core spray cooling system shall be reported to the Director of the appropriate NRC Regional Office within 24 hours of identification.
4. A written report of the results of the examinations including any corrective measures taken shall be submitted within 30 days of the completion of the examination to the Director of the NRC Regional Office with a copy to the NRC Office of Inspection and Enforcement, Division of Reactor Operations Inspection, Washington, D. C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

APPENDIX E

RELOOK RESULTS - 2/24/84

APPENDIX E

RELOOK RESULTS - 2/24/84

<u>Tape Count</u>	<u>Indication Number</u>	<u>Discussion</u>
000	①	Core spray piping (345°)-to-elbow. Reexamination and enhancement resolved the HAZ indication to be insignificant.
153	②	Approximately 10° azimuth midplane between nozzles 31 and 32. Insignificant.
176	③	"A" junction box-to-pipe weld on 0° side. Five indications were enhanced on-line and shown to be insignificant.
245	④	53.5° support bracket, 0° side, resolved to be insignificant. "A" sparger.
273	⑤	53.5° support bracket, 90° side, resolved as insignificant. "A" sparger.
298	⑥ & ⑦	"B" sparger (345°), 0° side, weld and nozzle B25. Indications observed during previous examinations. There were no observable changes.
391	⑦	"B" junction box, 270° side, no significant indications.
480	⑧	"D" sparger between 233.5° and 265.5° support brackets. Heavy longitudinal indications were resolved as rub marks (see tape count 800).
576	⑨	"D" junction box, 195°, on the 270° side. Very fine indication at bottom of sparger piping does not appear to have changed from 10/81 examination. On the 180° side, the indications on the junction box are not significant as they have been observed during the previous 2 examinations and exhibit no change.
704	⑩	"C" junction box, no significant indications.
732	⑪	"C" sparger between 233.5° and 265.5° support brackets. Indication is insignificant.

APPENDIX E

RELOOK RESULTS - 2/24/84 (Cont'd)

<u>Tape Count</u>	<u>Indication Number</u>	<u>Discussion</u>
746	⑫	"C" junction box (165°) from 180° side. Indication at weld toe in HAZ has not changed and is considered to be insignificant.
800	⑬	"D" sparger between 233.5° and 265.5° support brackets shows the heavy rub mark indication to be insignificant when viewed and lighted from below. Also see 8 above.

NOTE: Lower sparger (B&D) indications were difficult to resolve due to many blade guides stored adjacent to the core shroud. Many blade guides were raised an estimated 12 to 24 inches above normal making some areas inaccessible for relook.

FIELD DATA

Sw. R.I. EXAMINATION SUMMARY RECORD

PROJECT No. <i>17-7861-</i>		SITE: <i>PILGRIM STATION</i>					SHEET No. <i>786101</i>			
EXAMINATION AREA (SYSTEM/COMPONENT) <i>CORE SPRAY</i>		(LINE/SUBASSEMBLY) <i>SPARGER</i>					(IDENTIFICATION) <i>"A" SPARGER</i>			
	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER	DATE OF EXAMINATION	INDICATIONS				RESOLUTION RECORD COMPLETED	REMARKS
					NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER		
VISUAL	INITIAL EXAMINATION	<i>280001</i>	<i>RPS</i>	<i>21 FEB 84</i>		<i>✓</i>				<i>INCLUDES</i>
	CNF.									<i>NOZZLES</i>
	FOLLOW-UP EXAMINATION									
PT <input type="checkbox"/>	INITIAL EXAMINATION									
	CNF									
MT <input type="checkbox"/>	FOLLOW-UP EXAMINATION									
ULTRASONIC	0° LAM SCAN									
	0° WELD SCAN									
	0° ATTENUATION									
	45° SCAN									
	45° T SCAN									
	60° SCAN									
	CNF									
	OTHER									
SUMMARIZED BY: <i>John D. Gaus</i>									DATE: <i>30 Apr 84</i>	

Sw. R.I. EXAMINATION SUMMARY RECORD

PROJECT No. <i>17-7861</i>		SITE: <i>PILGRIM STATION</i>						SHEET No. <i>786102</i>		
EXAMINATION AREA (SYSTEM / COMPONENT) <i>CORE SPRAY</i>		(LINE / SUBASSEMBLY) <i>SPARGER</i>						(IDENTIFICATION) <i>"B" SPARGER</i>		
	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER	DATE OF EXAMINATION	INDICATIONS				RESOLUTION RECORD COMPLETED	REMARKS
					NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER		
V I S U A L	INITIAL EXAMINATION	<i>280002</i>	<i>RPS</i>	<i>21 FEB 84</i>		<i>✓</i>				<i>INCLUDES</i>
	CNF.									<i>NOZZLES</i>
	FOLLOW-UP EXAMINATION									
PT <input type="checkbox"/>	INITIAL EXAMINATION									
	CNF									
MT <input type="checkbox"/>	FOLLOW-UP EXAMINATION									
U L T R A S O N I C	0° LAM SCAN									
	0° WELD SCAN									
	0° ATTENUATION									
	45° SCAN									
	45° T SCAN									
	60° SCAN									
	CNF									
	OTHER									
SUMMARIZED BY: <i>Jim Dwiggins</i>									DATE: <i>30 Apr 84</i>	

S W R I VISUAL EXAMINATION RECORD

PROJECT No. <i>17-7861-004</i>		SITE <i>PILGRIM</i>		DATE: (DAY - MON. - YR.) <i>21 FEB 84</i>		TIME: (24 HR. CLOCK) EXAM STARTED <i>0340</i> EXAM ENDED <i>1330</i>		SHEET No. <i>280002</i>	
EXAMINATION AREA: (SYSTEM/COMP.) <i>CORE SPRAY</i>		(LINE / SUBASSEMBLY) <i>SPARGER</i>		(IDENTIFICATION) <i>B</i>		W ₀ LOCATION <i>N/A</i>		WELD TYPE: (— FLOW →) <i>N/A</i>	
EXAMINER <i>R.P. SHIMKUS</i>		SNT LEVEL <i>III</i>		PROCEDURE No. <i>900-7</i> REV. <i>6</i> DEV. <i>1</i>		METHOD DIRECT <input type="checkbox"/> REMOTE <input checked="" type="checkbox"/>		L ₀ LOCATION <i>N/A</i>	
EXAMINER <i>J.B. WARDWELL</i>		SNT LEVEL <i>II</i>		DESCRIBE: VISUAL AIDES <i>REMOTE TV CAMERA & LIGHTS</i>		WELD LENGTH <i>N/A</i>			
IND. No.	L LOCATION	W LOCATION	LOCATION UP OR DOWN STREAM	TYPE ROUND OR LINEAR	SIZE DIA. OR LENGTH	VT-1 <input checked="" type="checkbox"/> VT-2 <input type="checkbox"/> VT-3 <input type="checkbox"/> VT-4 <input type="checkbox"/> INI.			
<i>1</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>LINEAR</i>	<i>N/A</i>	REMARKS <i>INDICATIONS OBSERVED DURING PREVIOUS EXAM- RPS</i>			
						<i>INATIONS FROM THE B SPARGER JUNCTION BOX TO RPS</i>			
						<i>AND INCLUDING NOZZLE N°25 (FIRST NOZZLE RPS</i>			
						<i>FROM JUNCTION BOX) WERE OBSERVED DURING RPS</i>			
						<i>THIS EXAMINATION. THERE HAS BEEN NO RPS</i>			
						<i>OBSERVABLE CHANGE FROM THE OCTOBER 1981 RPS</i>			
						<i>EXAMINATION, SEE 1984 RELOOK TAPE. RPS</i>			
						<i>THERE WERE NO OTHER SIGNIFICANT INDICATIONS. RPS</i>			
						<i>INCLUDES NOZZLE EXAMINATIONS. RPS</i>			
EXAMINATION AREA LIMITATION (IF NONE, SO STATE) <i>180° OF SIDE OF SPARGER NEXT TO CORE SHROUD NOT EXAMINED. RPS</i>									
REVIEWED BY <i>Steve Magaro</i>					SNT LEVEL <i>II</i>		DATE <i>21 Feb 84</i>		PAGE 1 OF 1

Sw. R.I. EXAMINATION SUMMARY RECORD

PROJECT No. <i>17-7861</i>		SITE: <i>PILGRIM STATION</i>				SHEET No. <i>786103</i>				
EXAMINATION AREA (SYSTEM/COMPONENT) <i>CORE SPRAY</i>		(LINE/SUBASSEMBLY) <i>SPARGER</i>				(IDENTIFICATION) <i>"C" SPARGER</i>				
	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER	DATE OF EXAMINATION	INDICATIONS				RESOLUTION RECORD COMPLETED	REMARKS
					NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER		
VISUAL	INITIAL EXAMINATION	<i>280003</i>	<i>RPS</i>	<i>21 FEB 84</i>		<i>✓</i>				<i>INCLUDES</i>
	CNF.									<i>NOZZLES</i>
	FOLLOW-UP EXAMINATION									
PT <input type="checkbox"/>	INITIAL EXAMINATION									
	CNF									
MT <input type="checkbox"/>	FOLLOW-UP EXAMINATION									
ULTRASONIC	0° LAM SCAN									
	0° WELD SCAN									
	0° ATTENUATION									
	45° SCAN									
	45° T SCAN									
	60° SCAN									
	CNF									
	OTHER									
SUMMARIZED BY: <i>Jim Duigan</i>									DATE: <i>30 APR 84</i>	

S W R I VISUAL EXAMINATION RECORD								
PROJECT No. 17-7861-004	SITE <i>PILGRIM</i>		DATE: (DAY - MON. - YR.) 21 FEB 84		TIME: (24 HR. CLOCK) EXAM STARTED 0340 EXAM ENDED 1330		SHEET No. 280003	
EXAMINATION AREA: (SYSTEM / COMP.) <i>CORE SPRAY</i>	(LINE / SUBASSEMBLY) <i>SPARGER</i>		(IDENTIFICATION) <i>C</i>		W_O LOCATION <i>N/A</i>		WELD TYPE: (- FLOW →) <i>N/A</i>	
EXAMINER <i>R P SHIMKUS</i>	SNT LEVEL <i>III</i>	PROCEDURE No. 900-7 REV. 6 DEV. 1	METHOD DIRECT <input type="checkbox"/> REMOTE <input checked="" type="checkbox"/>			L_O LOCATION <i>N/A</i>		
EXAMINER <i>J B UARDWELL</i>	SNT LEVEL <i>II</i>	DESCRIBE: VISUAL AIDES <i>REMOTE TV & LIGHTS</i>					WELD LENGTH <i>N/A</i>	
IND. No.	L LOCATION	W LOCATION	LOCATION UP OR DOWN STREAM	TYPE ROUND OR LINEAR	SIZE DIA. OR LENGTH	VT-1 <input checked="" type="checkbox"/> VT-2 <input type="checkbox"/> VT-3 <input type="checkbox"/> VT-4 <input type="checkbox"/>		INI.
						REMARKS <i>No SIGNIFICANT INDICATION'S</i>		<i>RPS</i>
						<i>INCLUDES NOZZLE EXAMINATIONS</i>		<i>RPS</i>
EXAMINATION AREA LIMITATION (IF NONE, SO STATE) <i>180° OF SIDE OF SPARGER NEXT TO CORE SHOULD NOT EXAMINED RPS</i>								
REVIEWED BY <i>Alex M... ..</i>			SNT LEVEL <i>II</i>			DATE <i>24 Feb 84</i>		PAGE 1 OF 1

Sw. R.I. EXAMINATION SUMMARY RECORD

PROJECT No. <i>17-7861</i>		SITE: <i>PILGRIM STATION</i>				SHEET No. <i>786104</i>				
EXAMINATION AREA (SYSTEM / COMPONENT) <i>CORE SPRAY</i>		(LINE / SUBASSEMBLY) <i>SPARGER</i>				(IDENTIFICATION) <i>"D" SPARGER</i>				
	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER	DATE OF EXAMINATION	INDICATIONS				RESOLUTION RECORD COMPLETED	REMARKS
					NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER		
VISUAL	INITIAL EXAMINATION	<i>280004</i>	<i>RPS</i>	<i>21 FEB 84</i>		<i>✓</i>				<i>INCLUDES</i>
	CNF.									<i>NOZZLES</i>
	FOLLOW-UP EXAMINATION									
PT <input type="checkbox"/>	INITIAL EXAMINATION									
	CNF									
MT <input type="checkbox"/>	FOLLOW-UP EXAMINATION									
ULTRASONIC	0° LAM SCAN									
	0° WELD SCAN									
	0° ATTENUATION									
	45° SCAN									
	45° T SCAN									
	60° SCAN									
	CNF									
	OTHER									
SUMMARIZED BY: <i>Jim Hargan</i>									DATE: <i>30 Apr 84</i>	

S W R I VISUAL EXAMINATION RECORD									
PROJECT No. 17-7861-004		SITE PILGRIM		DATE: (DAY - MON. - YR.) 21 FEB 84		TIME: (24 HR. CLOCK) EXAM STARTED 0340 EXAM ENDED 1330		SHEET No. 280004	
EXAMINATION AREA: (SYSTEM / COMP.) CORE SPRAY		(LINE / SUBASSEMBLY) SPARGER		(IDENTIFICATION) D		W ₀ LOCATION N/A		WELD TYPE: (— FLOW →) N/A	
EXAMINER R.P. SHIMKUS		SNT LEVEL III	PROCEDURE No. 900-7 REV. 6 DEV. 1		METHOD DIRECT <input type="checkbox"/> REMOTE <input checked="" type="checkbox"/>		L ₀ LOCATION N/A		
EXAMINER J.B. WARDWELL		SNT LEVEL II	DESCRIBE: VISUAL AIDES REMOTE TV CAMERA & LIGHTS				WELD LENGTH N/A		
IND. No.	L LOCATION	W LOCATION	LOCATION UP OR DOWN STREAM	TYPE ROUND OR LINEAR	SIZE DIA. OR LENGTH	VT-1 <input checked="" type="checkbox"/> VT-2 <input type="checkbox"/> VT-3 <input type="checkbox"/> VT-4 <input type="checkbox"/> INI.			
						REMARKS NO SIGNIFICANT INDICATIONS RPS			
						INCLUDES NOZZLE EXAMINATIONS RPS			
EXAMINATION AREA LIMITATION (IF NONE, SO STATE)									
180° OF SIDE OF SPARGER NEXT TO CORE SHAROUD NOT EXAMINED RPS									
REVIEWED BY Steve Macara			SNT LEVEL II			DATE 24 Feb 84		PAGE / OF /	

Sw. R.I. EXAMINATION SUMMARY RECORD

PROJECT No. <i>17-7861</i>			SITE: <i>PILGRIM STATION</i>					SHEET No. <i>786105</i>		
EXAMINATION AREA (SYSTEM / COMPONENT) <i>CORE SPRAY</i>			(LINE / SUBASSEMBLY) <i>CORE SPRAY PIPING</i>					(IDENTIFICATION) <i>PIPING</i>		
	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER	DATE OF EXAMINATION	INDICATIONS				RESOLUTION RECORD COMPLETED	REMARKS
					NO RECORDABLE	INSIGNIFICANT	GEOMETRIC	OTHER		
V I S U A L	INITIAL EXAMINATION	<i>280005</i>	<i>RPS</i>	<i>21/22 FEB 84</i>		<i>✓</i>				
	CNF.									
	FOLLOW-UP EXAMINATION									
PT <input type="checkbox"/>	INITIAL EXAMINATION									
	CNF									
MT <input type="checkbox"/>	FOLLOW-UP EXAMINATION									
U L T R A S O N I C	0° LAM SCAN									
	0° WELD SCAN									
	0° ATTENUATION									
	45° SCAN									
	45° T SCAN									
	60° SCAN									
	CNF									
	OTHER									
SUMMARIZED BY: <i>Jim Dugan</i>									DATE: <i>30 Apr 84</i>	

[illegible]

APPROXIMATELY 90° OF SIDE OF PIPING NEXT TO VESSEL WALL NOT EXAMINED NPS

REVIEWED BY James B. Wardwell

II

24 FEB 84

PAGE / OF i