SOUTHWEST RESEARCH INSTITUTE
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1981 REMOTE VISUAL EXAMINATION OF THE CORE SPRAY SPARGER SYSTEM OF PILGRIM NUCLEAR POWER STATION, UNIT 1

FINAL REPORT
SwRI Project 17-6676

Prepared for
Boston Edison Company
Pilgrim Nuclear Power Station
RFD 1, Rocky Hill Road
Plymouth, Massachusetts 02360

December 1981

Prepared by

Alfred R. Anderson for CHC

Approved by

Wayne T. Flach

Wayne T. Flach
Director
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Quality Assurance Systems
and Engineering Division

ABSTRACT

A remote Visual (VT) examination of the core spray sparger system of the Reactor Pressure Vessel (RPV) of Boston Edison Company's (BECo) Pilgrim Nuclear Power Station, Unit 1, was performed during the October 1981 refueling outage. The first remote VT examination during the initial 10-year inspection period was performed in January 1980. The January 1980 examination indicated four areas of concern which were reported to BECo on Customer Notification Form (CNF) No. 000002 dated February 2, 1980. All areas which revealed indications were reexamined in October 1981 using improved equipment, lighting, and enhancement techniques.

All but two of the previously reported indications were resolved as being insignificant (grinding marks, or could not be reestablished). The remaining two indications were determined not to have changed since the 1980 examination and have stabilized with regard to crack propagation. Further area degradation is not anticipated.

No other recordable indications were observed.

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LIST OF ABBREVIATIONS

ASME	-	American Society of Mechanical Engineers
BECo	-	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 October 1981 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 examination and was performed to meet the intent of the Nuclear Regulatory Commission Inspection and Enforcement Bulletin No. 80-13.

A. Examination Areas

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," 1974 Edition, with Addenda through Summer 1975. In addition, the examination addressed the requirements of the Inspection and Enforcement Bulletin 80-13 for visual resolution of a 0.001-inch diameter wire placed in the examination area.

SwRI Project Plan for the 1981 Inservice Remote Visual Examination of Pilgrim Nuclear Power Station, Unit 1.

As a continuing observation of the indications detected during the January 1980 outage, the following components and areas were examined using the remote VT testing techniques.

Reactor Pressure Vessel

- Core Spray Nozzles
- Core Spray Piping and Header
- Core Spray Sparger Piping

B. Summary of Examination Results

The remote VT examinations were conducted in accordance with SwRI Nondestructive Testing (NDT) procedure 900-2, Rev. 7, Deviations 1 & 2, 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.

The remote VT examinations revealed numerous insignificant indications. The linear indications reported on CNF 000002 as a result of the 1980 examination were closely scrutinized and computer enhanced for better resolution. All but two of the previously reported indications were resolved as insignificant; i.e., grinding marks or shadows. 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 1980 examinations, several examination areas were limited because of structural interference.

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 provided by CTS Consulting Personnel Services, Inc., was used for the VT examinations. Certain portions of the video tape recorded data was 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 are also identified on the sheets.

D. Summary of Nondestructive Examinations

The following sections of this report are presented for explanation of the Summary of Nondestructive Examinations Table (Summary Table). The Summary Table provides information and results for the nondestructive examinations performed during the October 1981 refueling outage.

1. ASME Section XI Item No. and Category

The ASME Section XI Item No. and Category are listed in the first and second columns respectively.

2. Examination Area Identification Column

In the column entitled "Examination Area Identification," each component examined (nozzle, cladding, patch, etc.) is identified by the component description. The azimuth location for some of the components is also provided.

3. Examination Method Column

The NDT examinations required by Code, which for this scope of work is remote visual (VT), are identified in this column.

4. SwRI Procedure Identification Column

The fifth column of the table lists the SwRI NDT Procedure used for the examinations. The remote VT examinations were performed in accordance with SwRI Procedure NDT-900-2, Rev. 7, Deviations 1 & 2.

5. Summary Sheet Column

The column entitled "Summary Sheet No." references the summary sheet provided for each examination area. The summary sheets are included in the field data section of this report. In addition to summarizing the results of the examinations, the summary sheets list the record sheet numbers, the SwRI examiner, dates of the examinations and resolution sheet numbers.

6. Indications Columns

The four columns under the general heading of "Indications" are "No Recordable," "Insignificant," "Geometric" and "Other." These columns were used as required, and their general description is provided below.

The results for the remote VT examinations are indicated by an "X" in the appropriate column to be either "No Recordable," "Insignificant" or "Other." The term "Insignificant" is used for those indications that the examiner observed but determined were of a nature that did not require reporting to the customer. "Other" is used when indications are observed that are of a nature that should be reported to the customer.

7. Remarks Column

The "Remarks" column is used to provide additional information pertinent to the examination results:

- When complete coverage of the examination was not possible, the "Remarks" column was used to indicate the limitations.
- For examination results reported in the "Other" column, a brief description is given in the "Remarks" column.
- When reference is made in the "Remarks" column to a CNF used in the reporting of indications.

E. Summary Table

The Summary Table is located on page 5 of this report.

PILGRIM NUCLEAR POWER STATION, UNIT 1
1981 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	
		CORE SPRAY LINES NOZZLES AND ATTACHMENTS								
B1.16	B-N-2	Core Spray Sparger Nozzle 40B & 41B	VT	900-2/7 Dev. 1&2	301000		X			Reexamination of the support areas revealed that the 1980 indications were the result of grinding to remove weld undercut. Resolution determined by camera angle previously unavailable. Examined only half of weld due to proximity of core shroud wall.
B1.16	B-N-2	Core Spray Sparger Junction Box-to-Pipe 345° to Nozzle 25B	VT	900-2/7 Dev. 1&2	301001				X	Reexamination of the 1980 linear indication revealed no apparent change and that crack had stabilized. Examined only half of weld due to proximity of core shroud wall.
B1.16	B-N-2	Core Spray Sparger 165° Header	VT	900-2/7 Dev. 1&2	301002		X			Reexamination of the 1980 indication revealed no current indication. Suspect that the 1980 indication was a shadow. Improved lighting enabled better observation. Examined only half of weld due to proximity of core shroud wall.
B1.16	B-N-2	Core Spray Sparger 15° Header "A" Sparger	VT	900-2/7 Dev. 1&2	301003				X	Reexamination of the 1980 indication confirmed by using computer enhancement techniques. Heat-affected zone crack in the lower quadrant. Examined only half of weld due to proximity of core shroud wall.
B1.16	B-N-2	Core Spray Sparger "A" Sparger 270°	VT	900-2/7 Dev. 1&2	301004		X			Reexamination of the 1980 indication resolved the indication as insignificant.
B1.16	B-N-2	Core Spray Sparger "C" Sparger 195°	VT	900-2/7 Dev. 1&2	301005	X				Reexamination of the 1980 indication revealed no current indication. Area was wire brushed during reexamination and no indication could be found.

APPENDIX A

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS OPERATING PROCEDURES

APPENDIX A

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS OPERATING PROCEDURES

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Written By		Date
Technical Review		Date
Manager of QA		Date
Cognizant Director		Date
		SS

DEVIATIONS TO NUCLEAR FIELD SERVICES SECTION OPERATING PROCEDURES

1.0 PURPOSE

1.1 The purpose of this operating procedure is to establish guidelines and controls for deviations to Nuclear Field Services Section operating procedures.

2.0 SCOPE AND APPLICATION

2.1 This procedure applies to Nuclear Projects Operating Procedures used by the Nuclear Field Services Section.

2.2 Deviations written in accordance with this procedure shall be applicable only to the specified plant and examination area described in the Request for Procedure Deviation 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.

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
W. J. Hunsucker	10/1/76	W. J. Hunsucker	10/1/76	[illegible]	10/26/76	[illegible]	10/26/76	[illegible]

3.3 The Manager of the Section, Team Leader, 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.

4.0 PROCEDURE

4.1 The Manager of the Section, Team Leader, or other cognizant persons who require a deviation to a Nuclear Field Services Section operating procedure shall be responsible for initiating a Request for Procedure Deviation 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 request for 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 Manager of the Nuclear Field Services Section, or his designated alternate, shall assign responsibility for preparing the NDT procedure deviation.

4.2.1 The Request for Procedure Deviation, 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) Deviation Required

(7) Examination Areas Affected by Deviations, and

(8) Basis of Deviations.

4.2.2 Deviation numbers shall be assigned by the Manager of Support Services 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 Manager of the Nuclear Field Services Section or his designated alternate.

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 to the Department Director, or his designated alternate.

4.6 If approved, the Department Director, or his designated alternate, shall sign the procedure deviation as approved and forward it to the Manager of the Nuclear Field Services Section.

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.

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
R C Ellisor	9/28/78	W. C. [illegible]	10/2/78	[illegible]	10/2/78	[illegible]	10/6/78	[illegible]

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
W. F. Hammann	10-18	W. Hagler	Oct 25	William C. Hagler	10/26	Roger L. Hagler	10/26	

(3) Approved By. Manager of Quality Assurance, or his designated alternate.

(4) Approved By. Department Director, or his designated alternate.

4.8 The Manager of the Nuclear Field Services Section shall forward the original Request for Procedure Deviation, Form FE-4-3, to the Nuclear Field Services Section file and a copy to the initiating Section Manager or team leader.

4.9 The requesting team leader may use the deviation of Nuclear Field Services Section operating procedure upon receipt of the final approval deviation and site approval of the deviation.

4.10 The deviation number shall be recorded in conjunction with the appropriate NDT procedure number on all records requiring the recording of procedure number.

4.11 A copy of the Request for Procedure Deviation, Form FE-4-3, shall be attached to the applicable procedure when conducting examinations in accordance with the deviation.

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 The Manager of Support Services shall be responsible for storage and retrieval of documents generated.

5.3 A copy of the approved deviation on Request for Procedure Deviation, Form FE-4-3, shall be forwarded to the Manager of Quality Assurance for the historical file.

PROCEDURE DEVIATION

SITE:

PROCEDURE / REVISION NO.

DEVIATION NO.	PAGE OF	DATE REQUESTED:	SECTION:	PAGE OF

1. EXAMINATION AREAS AFFECTED BY DEVIATION: List each specific area or component to be examined in accordance with this deviation (state examination period, component identification, line identification, weld identification, etc.)

2. DEVIATION: 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):

3. JUSTIFICATION: Reason change is necessary and what it is ifended to accomplish (use additional sheets if necessary):

REQUESTED BY	DATE	TECHNICAL REVIEW	DATE	MANAGER OF Q.A.	DATE	DEPARTMENT DIRECTOR	DATE	QC	

SWRI FORM FE-4-3

SS			
Date			
Cognizant Director			
Date			
Manager of QA			
Date			
Technical Review			
Date			
Written By			

EFFECTIVITY

Revision 1 of this Procedure became effective September 1976. Revision 1 consists of the pages, changes, and revisions listed below.

Page Number	Change	Revision	Effective Date
1-2	0	1	September 1976
3	1	1	September 1978
4-5	0	1	September 1976
5a	1	1	September 1978

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS	
Ufuk R. Cakmak	6-11-80	[signature]	11-6-80	[signature]	11-6-80	[signature]	11/6/80	[signature]	

ONSITE NDE RECORDS CONTROL

1.0 PURPOSE

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

2.0 SCOPE AND APPLICATION

2.1 This procedure is limited to describing the flow of data records used to document the results of the nondestructive examinations performed. Data records include Original Data Sheets, Summary Sheets, Resolution Sheets, strip charts, magnetic tapes, video tapes, or other information as defined by the Inspection Engineer or Team Supervisor.

2.2 Where necessary to explain the flow of the records, functional steps are provided in this procedure.

2.3 This procedure provides guidance to personnel of the Nuclear 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.

3.0 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 Manager of the Nuclear Field Services Section, Department of Engineering Services, shall be responsible for the implementation of this procedure in accordance with the Nuclear Quality Assurance Program Manual (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 Support Services, Quality Assurance Systems and Engineering Division, shall be responsible for storage of records generated in accordance with this procedure.

	SS	Date	Cognizant Director	Date	Manager of QA	Date	Technical Review	Date	Written By	Date
	X			18 Jun 80		11-6-80				6-11-80

4.0 PROCEDURE

4.1 Original Data Sheets

(1) Original Data Sheets are originated when they are printed and serialized either at SwRI or the site.

(2) Original Data Sheets shall be filled out at the place and time of the examination.

(3) The Original Data Sheets are 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), and an entry shall be made into a daily log indicating that the examinations have been performed.

(4) The Original Data Sheets are then 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 and, to the extent practicable, 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 are returned to the Examiner.

(c) After clarifications or corrections, if any, are made, the Reviewer shall sign each Original Data Sheet that does not contain indications which require evaluation/resolution.

(6) The Original Data Sheets that have been reviewed and signed are moved to the To-Be-Summarized file. See Paragraph 4.1(9).

Written By	Date	Technical Reviewer	Date	Manager of QA	Date	Cognizant Director	Date	SS
Gerald R. Anderson	6-11-80	Dan Wilkinson	11-6-80	L. S. Kelly	11-18-80	Wayne F. Ward	11/19/80	X

(7) Original Data Sheets which contain indications requiring evaluation/resolution are placed in the To-Be-Resolved file.

(a) Original Data Sheets in the To-Be-Resolved file which document visual or surface examinations are handled as follows:

(1) The Original Data Sheets are reviewed, signed by the Reviewer, and used to generate a Customer Notification Form (CNF). (The CNF is 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 then processed as specified in Paragraphs 4.1(5) and 4.1(6).

(8) If a computer is being used to record results and generate Summary Sheets, computer input will be made. 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 is 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 originated when they are printed and serialized either at SwRI or the site.

(2) Summary Sheets shall be filled out for each examination area. In certain cases (studs, nuts, etc.), one Summary Sheet may be used for more than one examination area.

(3) Summary Sheets are to be filled out prior to the completion 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 originated when they are printed and serialized either at SwRI or on the site.

(2) The Level II or Level III 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 will 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 will 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 are generated during mechanized ultrasonic examinations.

(2) As the charts and tapes are generated, they are identified with a sequence number and with the examination areas for which they contain data.

(3) During the resolution of any indications, the strip charts and tapes may be used by the Level II or Level III.

(4) The strip charts and tapes are then made ready for transmittal to SwRI.

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
Alfred R. Anderson	6-11-80	[illegible]	11-8-80	[illegible]	11-8-80	[illegible]	11/8/80	[illegible]

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
Lloyd R. Anderson	6-11-80	R. W. Dimmick	11-6-80	L. S. McCord	11-18-80	Wayne F. Hall	6/18/80	

5.0 RECORDS

5.1 Prior to departing from the site at the completion of a pre-service or inservice examination, the original data package with the exception of strip charts, magnetic tapes, and video tapes shall be reproduced and copy(ies) transmitted to the appropriate site personnel. At no time will data be reproduced for this transmittal until the required examinations for a particular area are complete, the data reviewed, and the Summary Sheets have been completed.

5.2 At the end of the site activity (or at other times deemed appropriate by the Inspection Engineer or Team Supervisor), the original data package will be transmitted to SwRI in accordance with SwRI Operating Procedure XVII-AG-101-0.

Written By		Date
Technical Review		Date
Manager of QA		Date
Cognizant Director		Date
		SS

CONTROL OF NUCLEAR INSPECTION EQUIPMENT AND MATERIALS

1.0 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.

2.0 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.

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS	Date		

2.4.1 SwRI Nuclear Quality Assurance Program Manual (NQAPM).

2.4.2 SwRI Radiological Health and Safety Manual.

3.0 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 under the supervision of the Manager, Support Services, who 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 returned from an inservice examination, its decontamination, and returned to its proper storage facility.

3.5 The Manager, Design Engineering and Fabrication, or his alternate shall be responsible for providing minimum maintenance turnaround time and for providing current certifications as required for nuclear examination equipment.

4.0 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.

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.

4.2.4 The Equipment Clerk will forward Copy 1 of Form SS-17 (white) the Shipping Agent, will give Copy 2 (yellow) to the person signing the form, and will retain Copy 3 (pink) for his records. Copy 4 (goldenrod) will be given to the QA Representative.

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 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).

Written By	Date	Technology Review	Date	Manager of QA	Date	Cognizant Director	Date	SS

SwRI Form QA-3-1

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
Cliff G. Wolfe	10/27/80	[illegible]	10/28/80	[illegible]	10/28/80	[illegible]	10/28/80	[illegible]

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 and/or unused materials 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 appropriate remarks block of copy 3 of the Form SS-17. He will also initial in the appropriate remarks block of copy 2 of the Form SS-17 when requested.

4.6.2 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 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 Manager, Nuclear Field Services, and the Equipment Control Clerk in writing of the nomenclature and the serial number of the equipment, and the site the equipment came from.

4.6.3 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.

4.6.4 The Equipment Clerk will check each item for disposition. Equipment requiring repair, cleaning, or recertification/ recalibration within the next 30 calendar days must be accompanied by a Form SS-19, Hold Tag (Attachment 3); and 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 Manager, Nuclear Field Services, and the Manager, Design Engineering and Fabrication, with a copy to the Manager of Support Services. The memorandum will identify the equipment and describe the circumstances involved with its loss or destruction.

Written By		Date
Technical Review		Date
Manager of QA		Date
Cognizant Director		Date
SS		

SwRI Form QA-3-1

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS	Date		

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 place a "Hold Tag" on the item and take the equipment to the appropriate certifying facility. When the equipment has been issued, he will notify the Field Services Activity Coordinator 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 place a "Hold Tag" on the item and 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.

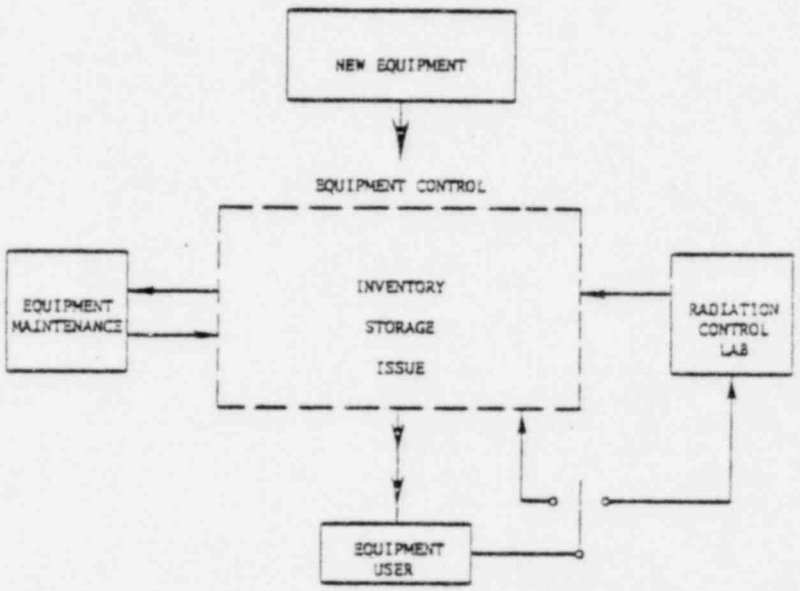
5.0 RECORDS

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.

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS



Attachment 1

Written By	Date	
Technical Review	Date	
Manager of QA	Date	
Cognizant Director	Date	
	SS	

PAGE OF PAGES

EQUIPMENT CONTROL / SHIPPING LIST DATE

PROJECT NO.	SITE	DATE REQUIRED	SHIPPING METHOD

RESPONSIBLE SUPERVISOR | APPROX. RETURN DATE

QTY.	NOMENCLATURE	CERT. REQ'D	SERIAL NO.	BOX NO.	COST	REMARKS

TOTAL COST

RECEIVED BY | AUDITED BY

SWRI FORM 53-17-1

This Form is a 4 copy form, Page 1 is white, page 2 is yellow, page 3 is pink, and page 4 is goldenrod.

Attachment 2

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS

HOLD

DO NOT USE

SwRI Form 55-19

REASON FOR HOLD

NAME

Attachment 3

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
Rudy Gutierrez	9/14/80	[illegible]	9/14/80	K S Brown	9/14/80	[illegible]	9/15/80	[illegible]

RECALIBRATION NOTICE

TO	FROM	DATE

THE EQUIPMENT LISTED BELOW WILL BE DUE RECALIBRATION AS INDICATED. PLEASE RETURN THIS EQUIPMENT TO THE EQUIPMENT ROOM AS SOON AS POSSIBLE.

ITEM	SERIAL NUMBER	RECALIBRATION DATE	LOCATION

Recalibration Notice
(SwRI Form SS-42)
Attachment 4

Written By	[illegible]	Date	[illegible]	SS
Technical Review	[illegible]	Date	2-25-80	
Manager of QA	[illegible]	Date	3/6/80	
Cognizant Director	[illegible]	Date	4/30/80	

EFFECTIVITY PAGE

Revision 1 of this Operating Procedure became effective in April 1980.

Revision 1 consists of the pages and changes listed below.

Page Number	Change	Revision	Effective Date
1-4	0	1	April 1980
5	1	1	October 1980
6-11	0	1	April 1980
12	1	1	October 1980

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE

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.

Page No	Change	Date Effective
1-7	0	2/10/81

SA CK

Approvals

Written By	Date	Technical Review	Date
Richard A. Hutchinson	27 Jan 81	Edward D. Gabrysch	27 Jan 81
Manager of Q.A.	**Date**	**Cognizant Director**	**Date**
W. J. & E. Engelhardt	2/9/81	R. Trujillo	10 Feb 81

SwRI Form QA-402

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.

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 Facilities for SwRI-retained quality assurance records are located in Building 124 and Building 139. The construction of Building 124 is concrete block with a steel door entrance. The construction of the facility in Building 139 is concrete block with steel vault door. Both facilities have temperature control devices 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.

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.

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.

APPENDIX A

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

Record Type		Retention Period
(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

Record Type		Retention Period
(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

(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

PROCEDURE DEVIATION

SITE:	PROCEDURE / REVISION NO.
Pilgrim Station	900-2/7

DEVIATION NO.	PAGE	DATE REQUESTED:	SECTION:	PAGE
1	1 OF 1	5 August 1981	5.1	2 OF 6

1. EXAMINATION AREAS AFFECTED BY DEVIATION: List each specific area or component to be examined in accordance with this deviation (state examination period, component identification, line identification, weld identification, etc.)

Visual Examination of Core Spray Sparger Components to be conducted during the 1981 inservice examination of Pilgrim Station and utilizing SwRI-NDT-900-2/7 will be affected by this deviation.

2. DEVIATION: 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):

Change paragraph 5.1, "Personnel Certification" to read as follows:

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

3. JUSTIFICATION: Reason change is necessary and what it is intended to accomplish (use additional sheets if necessary):

This change is required because NQAP 11-1 has been superseded by NQAP 11-2 for visual examinations.

REQUESTED BY	O.K.	DATE	8/17/81
TECHNICAL REVIEW		DATE	7 Aug 81
MANAGER OF Q A		DATE	8/21/81
DEPARTMENT DIRECTOR		DATE	8/19/81
DC			

SWRI FORM PE-4-3

PROCEDURE DEVIATION

SITE:	PROCEDURE / REVISION NO.
Pilgrim Station	900-2/7

DEVIATION NO.	PAGE	DATE REQUESTED:	SECTION:	PAGE
2	1 OF 1	October 5, 1981	6.0	3,4 OF 6

1. EXAMINATION AREAS AFFECTED BY DEVIATION: List each specific area or component to be examined in accordance with this deviation (state examination period, component identification, line identification, weld identification, etc.)

Visual Examination of Core Spray Sparger Components to be conducted during the 1981 inservice examination of Pilgrim Station and utilizing SwRI-NDT-900-2/7 will be affected by this deviation.

2. DEVIATION: 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):

Change paragraph 6.2.2 to read as follows:

6.2.2 Resolution

Resolution shall be considered adequate when:

(1) The combination of access, lighting, and angles of vision, either unaided or corrected, can resolve a black line 1/32-inch wide on an 18% neutral gray card placed on the surface to be examined, or for the examination of core spray spargers the following shall apply;

(2) the intent of NRC Bulletin 80-13 is met such that the limit of resolution is determined by fine wires of .001", 004", or .006" nominal diameter superimposed upon the area of interest.

Change paragraph 6.3.1 to read as follows:

Resolution shall be considered adequate when:

(1) The combination of access, lighting and angles or vision, either unaided or corrected, can resolve a black line 1/32-inch wide 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, or for the examination of core spray spargers the following shall apply;

(2) the intent of NRC Bulletin 80-13 is met such that the limit of resolution is determined by fine wires of .001", 004", or 006" nominal diameter superimposed upon the area of interest.

3. JUSTIFICATION: Reason change is necessary and what it is intended to accomplish (use additional sheets if necessary):

This deviation is necessary to meet the requirements of NRC Bulletin 80-13.

	DC	DATE	DIRECTION	DEPARTMENT	DATE	MANAGER OF Q.A.	DATE	TECHNICAL REVIEW	DATE	REQUESTED BY
	Q(1)	10/5/81	K. Singleton		10/5/81		5 OCT 81		10/5/81	R. Shimkus

SWRI FORM FE-4-3

Written By		
Date		
Technical Review		
Date		
Manager of QA		
Date		
Cognizant Director		
Date		
SS		

VISUAL EXAMINATION OF NUCLEAR REACTOR INTERNALS BY DIRECT OR REMOTE VIEWING

SwRI-NDT-900-2

1.0 PURPOSE

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

2.0 SCOPE AND APPLICATION

Nuclear reactor internals as specified in the applicable SwRI Examination Plan shall be examined visually by direct or remote viewing.

2.1 Applicable Documents

The following documents form a part of this procedure, as applicable:

(1) ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition, with Addenda through Summer 1975, "Rules for Inservice Inspection of Nuclear Power Plant Components."

(2) ASME Boiler and Pressure Vessel Code, Section V, 1974 Edition, with Addenda through Summer 1975, "Nondestructive Examination."

(3) SwRI Nuclear Quality Assurance Program Manual (NQAPM).

3.0 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 Manager of the Nuclear Field Services Section, Department of Engineering Services, shall be responsible for the implementation of this procedure in accordance with the NQAPM specified in the applicable SwRI Project Plan.

(3) The examiner shall be responsible for implementing the requirements of this procedure.

(4) The Manager of Support Services, Quality Assurance Systems and Engineering Division, shall be responsible for storage of records generated in accordance with this procedure.

4.0 CODE AND PROCEDURE REQUIREMENTS

The following is a guide to the requirements for this procedure.

Requirements		Section
(1)	Personnel certification	5.0
(2)	Equipment	5.0
(3)	Surface condition and cleaning requirements	6.0
(4)	Examination method	6.0
(5)	Lighting requirements	6.0
(6)	Resolution	6.0
(7)	Examination areas	7.0

5.0 PERSONNEL AND EQUIPMENT

5.1 Personnel Certification

Personnel performing examinations shall be certified in accordance with SwRI NQAP 11-1, "Special Process Control."

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 down the center.

	SS	Date	Cognizant Director	Date	Manager of QA	Date	Technical Review	Date	Written by
	CX	3/15/78		2-24-78		23 MAR 78		3/14/78	

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

6.0 EXAMINATION METHOD

6.1 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.

6.2 Direct Visual Technique

Direct visual examination shall be performed by placing the eye within 24 inches 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 also be used.

6.2.1 Lighting

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

6.2.2 Resolution

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

6.3 Remote Visual Technique

Remote visual examination may be used when conditions exist that do not permit direct visual examination. Remote visual examination may include visual aids such as telescopes, periscopes, borescopes, fiber optics,

SS	Date	Cognizant Director	Date	Manager of QA	Date	Technical Review	Date	Written By
	2/17/78		3-24-78		23 MAR 78		1/4/78	

or TV 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.

6.3.1 Resolution

Resolution shall be considered adequate when the combination of access, lighting, and angles of vision, either unaided or corrected, can resolve a black line, 1/32-inch-wide, 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.

6.4 Replication

Surface replication techniques shall be considered acceptable provided the surface resolution is at least equivalent to that obtainable by the direct visual technique.

7.0 EXAMINATION AREAS

Section XI of the ASME Boiler and Pressure Vessel Code requires visual examination as a part of the inservice examination requirements in order to provide a report of the general condition of the reactor pressure vessel internals. This report shall include such conditions as wear, cracks, corrosion or erosion on the surfaces, or misalignment or movement of the 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, and the 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.

Components, parts, and method of examination shall be as specified in the applicable SwRI Examination Plan.

Written By	Date	Technical Review	Date	Manager of QA	Date	Cognizant Director	Date	SS
W. F. Hanneman	23 Feb 78	[illegible]	23 Mar 78	[illegible]	3-24-78	[illegible]	3/31/78	

8.0 RECORDING CRITERIA

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

The completed "SwRI Visual Examination Record" shall contain, but not be limited to, the following information:

(1) Identification of the examined part and the extent of the examination, including surface preparation, if required.

(2) Method and techniques used in the examination. This shall include visual aids, if used.

(3) Examination results with location and a description of any indications.

(4) Name and certification level of personnel performing the examination.

(5) Time and date of examination.

9.0 EVALUATION

Evaluation of reportable indications shall be the responsibility of the customer, or the customer's representative, in accordance with Article IWA-3000 of Section XI of the ASME Boiler and Pressure Vessel Code. The applicable year of the Code and Addenda shall be as specified in Paragraph 2.1(1) of this procedure.

10.0 RECORDS

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

Permanent documents generated in accordance with this procedure shall be stored and retained as a portion of the examination report. The examination report shall be stored by the Manager of Support Services, Quality Assurance Systems and Engineering Division, in the Data Storage Facility for the period specified by the contractual agreement with the customer.

SS	Date	Cognizant Director	Date	Manager of QA	Date	Technical Review	Date	Written By
	3/27/78		3-24-78		3/24/78		4/3/78	

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No.	SITE	DATE (DAY-MON-YR)	TIME (24 HR CLOCK) SHEET STARTED / SHEET ENDED	SHEET No.
EXAMINER	SNT LEVEL	PROCEDURE No. REV.	VISUAL AIDS (IF YES DESCRIBED) ☐YES ☐NO	
EXAMINER	SNT LEVEL		METHOD (IF REMOTE EXPLAIN) ☐DIRECT ☐REMOTE	
ELEMENT NAME	LOCATION	TYPE OF AREA EXAMINED		

IND No.	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)

REVIEWED BY	SNT LEVEL	DATE

FORM No. Sw.R.I. NDTR 17-29 (REV 7-31-75)

APPENDIX C

CERTIFICATES OF PERSONNEL QUALIFICATIONS

APPENDIX C

CERTIFICATES OF PERSONNEL QUALIFICATIONS

Table of Contents

SOUTHWEST RESEARCH INSTITUTE
NONDESTRUCTIVE EXAMINATION
STATEMENT OF CERTIFICATION

The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, certifies that Larry C. Reaves 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

Expiration Date: 10/21/84

Signed: Director, Department of Engineering Services Date: 10/21/81

EDUCATION, TRAINING AND EXPERIENCE HISTORY

EDUCATION:	NAME	YEARS	DEGREE
High School	Bass H.S. (Ga)	5	GRAD
Additional	North Georgia College	2	NO

Major Field of Study: Physics

Ft. Carson School of Aeronautics - 1 year

TRAINING (this method and level):

Date Completed: 08/02/79: 10/16/81

Hours: 24: 12 Location: SwRI

Date Employed by SwRI: 02/20/78

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	Date	Corr. Req.	Verified by
08/03/81	No	Heidi Gutierrez hig			

MOST RECENT EXAMINATION GRADES

	Scores	Weight
General:	92.50	.33-1/3
Specific:	87.50	.33-1/3
Practical:	81.33	.33-1/3
Composite:	87.11	1.0

Date: 10/16/81 Stanley M Walker

Responsible Level III: Stanley M. Walker

CERTIFICATION HISTORY: THIS LEVEL

	Date
Initial Certification:	09/04/79
Recertification:	10/21/81
Recertification:	
Recertification:	
Recertification:	

REMARKS

SwRI Form QA-42-0

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

Expiration Date: 09/02/84

Signed: _____ Date: 8 Sept 81
Vice President, Quality Assurance Systems and Engineering Division

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 Fabrictg.Co.	1953	1955
Goodyear Aerospace Corp.	1958	1968
Westinghouse Electric	1968	1970

Date 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	Corr. Req.	Verified by	Date	Corr. Req.	Verified by
10/03/80	Yes	Heidi Gutierrez			
09/23/81	Yes	Heidi Gutierrez			

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: C. A. Wantzenheiser

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

SwRI Form QA-40-0

APPENDIX D

FIELD MEMORANDUM TO BECo AS AMENDED AFTER
REVIEWING COMPUTER-ENHANCED PHOTOGRAPHS

APPENDIX D

FIELD MEMORANDUM TO BECo AS AMENDED AFTER
REVIEWING COMPUTER-ENHANCED PHOTOGRAPHS

TO: Frank Famulari
Boston Edison Company
Pilgrim Station

DATE: 9 October 1981

FROM: R. P. Shimkus
SwRI

SUBJECT: Preliminary Report of 1981 Remote Visual Examination of the Pilgrim Nuclear Reactor Core Spray Piping and Spargers

1.0 SCOPE

Perform a remote visual examination of the subject reactor component. The examination is to meet ASME SEction XI Item B1.15 and Category B-N-1. In addition, the examination is to address the NRC Bulletin 80-13 requirement for a visual resolution of a 1-mil wire placed in the examination area.

2.0 EXAMINATION

The examination was performed in accordance with the Southwest Research Institute (SwRI) Examination Plan prepared for Project 17-6676 (81-BEC-PPS-1-1-0) approved by Boston Edison Company (BECo). The resulting data was evaluated by the writer, a Level III visual examiner qualified by experience and written examination. Reexamination and surface cleaning was accomplished as considered necessary for indication resolution.

3.0 EXAMINATION RESULTS

3.1 Resolution of 1980 examination indications on Lower Sparger

3.1.1 "B" sparger, nozzle 40B. 1980 examination showed HAZ linear indications (see Figure 1). The 1981 examination resolved these as resulting from grinding to remove weld undercut (see Tape 10). The 1980 examination equipment did not permit viewing the indications from the nearly vertical position. The resulting oblique lighting cast a sharp narrow shadow (linear indication).

3.1.2 "B" sparger, nozzle 41B, see Figure 2. Same as 3.1.1.

3.1.3 345° Header-to-sparger pipe weld and area out to nozzle 25 on the "B" system. The 1980 examination showed many linear indications (see Figure 3). The 1981 examination exhibits the same characteristics as in 1980 (see Tape 8 count 330-413 and tapes 9 and 10). There is no continuous crack-like indication extending from over the top of the sparger

piping to underneath the same pipe. A fine line appears on the header-to-sparger weld, but because the weld is thicker than the sparger pipe wall, it would not normally be considered significant (a crack).

3.1.4 165° Header, "D" sparger, header-to pipe-weld. The linear indication found during the 1980 examination is no longer visible (see Figure 4). The 1980 indication is believed to have been a shadow.

3.2 Upper Sparger

3.2.1 15° Header, "A" Sparger, header-to-pipe-weld linear indication observed during the 1980 examination was found using computer enhancement techniques (see Figure 5). It appears to have stabilized with respect to crack growth. There was no indication that the crack extended into the upper quadrant.

3.2.2 The transverse indication on pipe 1"-12" towards 270° from the "A" sparger header observed during the 1980 examination has been resolved as not significant (see Figure 6), (see tape 8, count 413-453). This indication has been shown to have no depth when viewed close up normal to the pipe.

3.2.3 195° Header, "C" sparger, 1/2" to 1" from header-to-sparger weld on the pipe. The 1980 examination showed a linear indication extending vertically downward from an arc strike (see Figure 7). No linear indication could be found during the 1981 examination. The area was wire brushed and reexamined (see tape 10). No linear indication could be resolved.

4.0 CONCLUSION

Five of the indications from the 1980 examination have been resolved as not significant. Two were determined to be heavy grinding, one was determined to be a mechanical mark, and one of the indications could not be relocated (found).

One area, "B" header-to-pipe weld and the area to nozzle 25B was determined to have undergone no change since the 1980 examination. Cracks appear in the upper quadrant but are not shown to be present in the lower quadrant. This area has stabilized with regard to crack propagation and further area degradation is not anticipated.

The HAZ indication (crack) reported in 1980 on the "A" Sparger was relocated using computer enhancement techniques. The crack appears at about 4 o'clock and extends downward and out of sight. There is no

indication that the crack extended into the visible upper quadrant. This crack appears to have stabilized and further degradation is not expected.

R. P. Shimkus
Technical Consultant
Southwest Research Institute

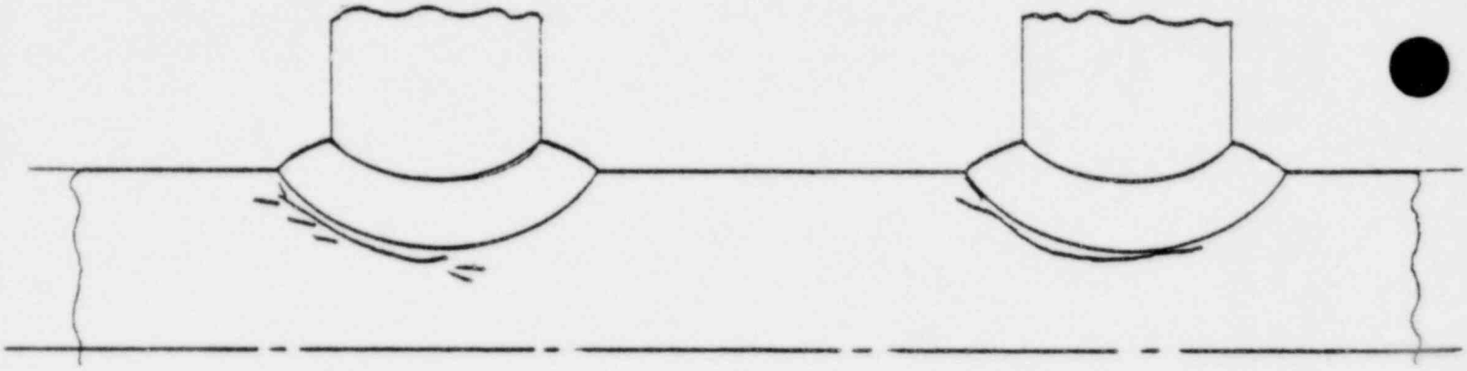


FIGURE 1. "B" SPARGER 1980 INDICATION
1981 RESOLVED AS OVER GRINDING

FIGURE 2. "B" SPARGER 1980 INDICATION
1981 RESOLVED AS OVER GRINDING

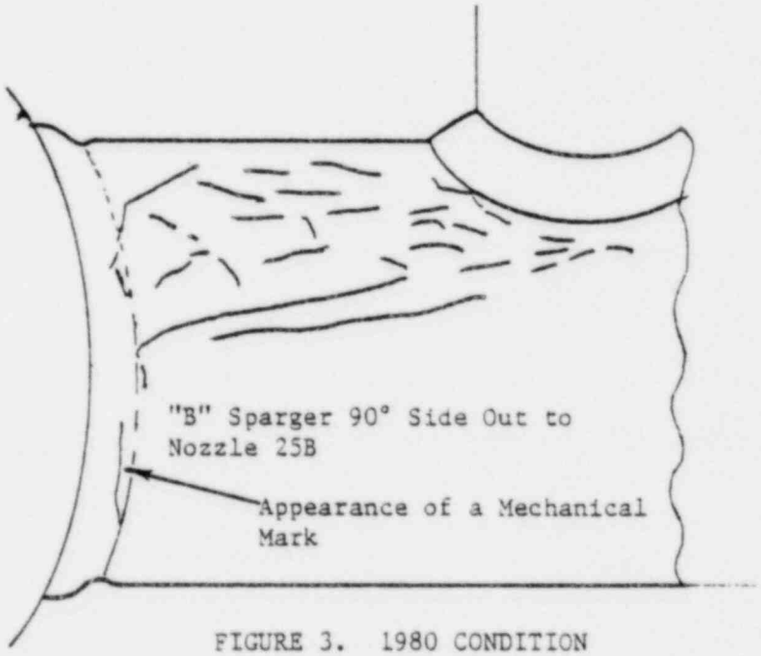


FIGURE 3. 1980 CONDITION
1981 NO CHANGE

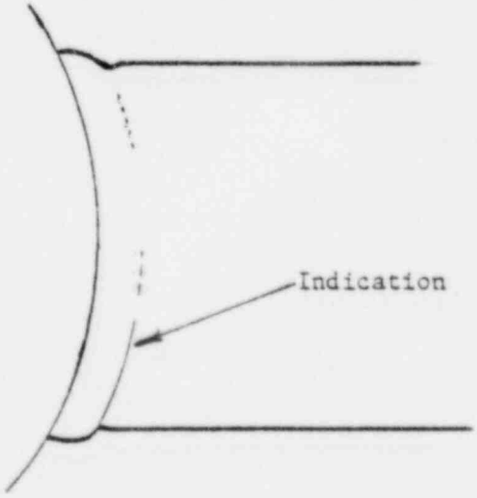


FIGURE 4. "D" SPARGER 180° SIDE
1980 CONDITION
1981 INDICATION FOUND BY
COMPUTER ENHANCEMENT TECHNIQUES

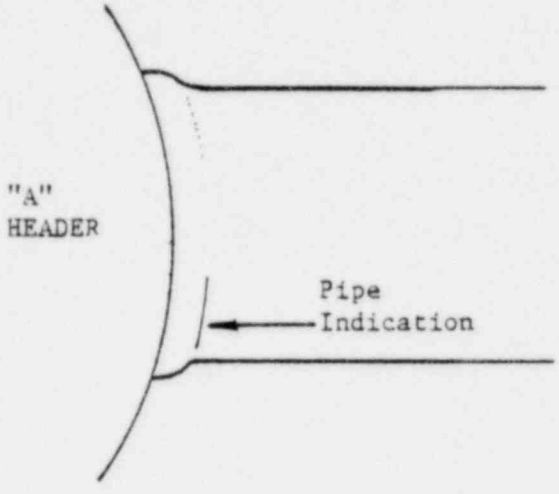


FIGURE 5. "A" HEADER 90° SIDE
1980 CONDITION
1981 INDICATION NOT FOUND

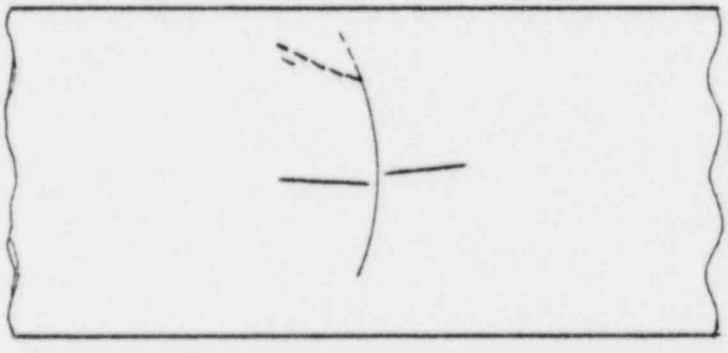


FIGURE 6. "A" SPARGER 8"-12" ON 270° SIDE OF HEADER
1980 CONDITION
1981 CONDITION IS THE SAME. RESOLVED AS MECHANICAL MARK.

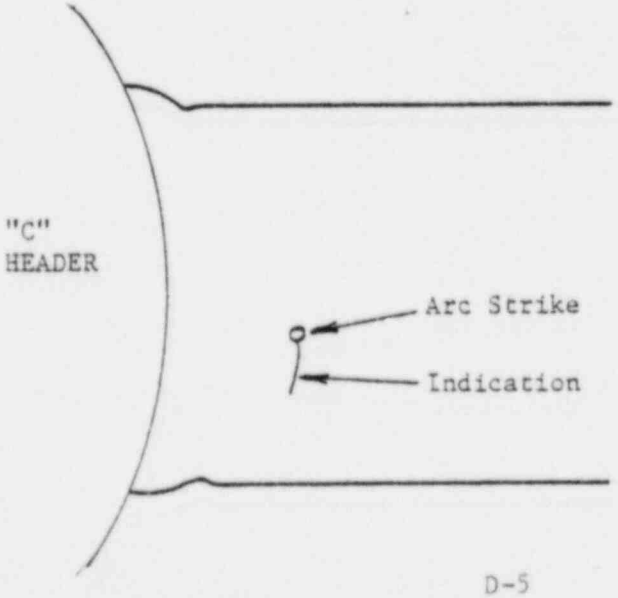


FIGURE 7. "C" HEADER 270° SIDE
1980 CONDITION
1981 INDICATION NOT FOUND BEFORE OR
AFTER WIRE BRUSHING

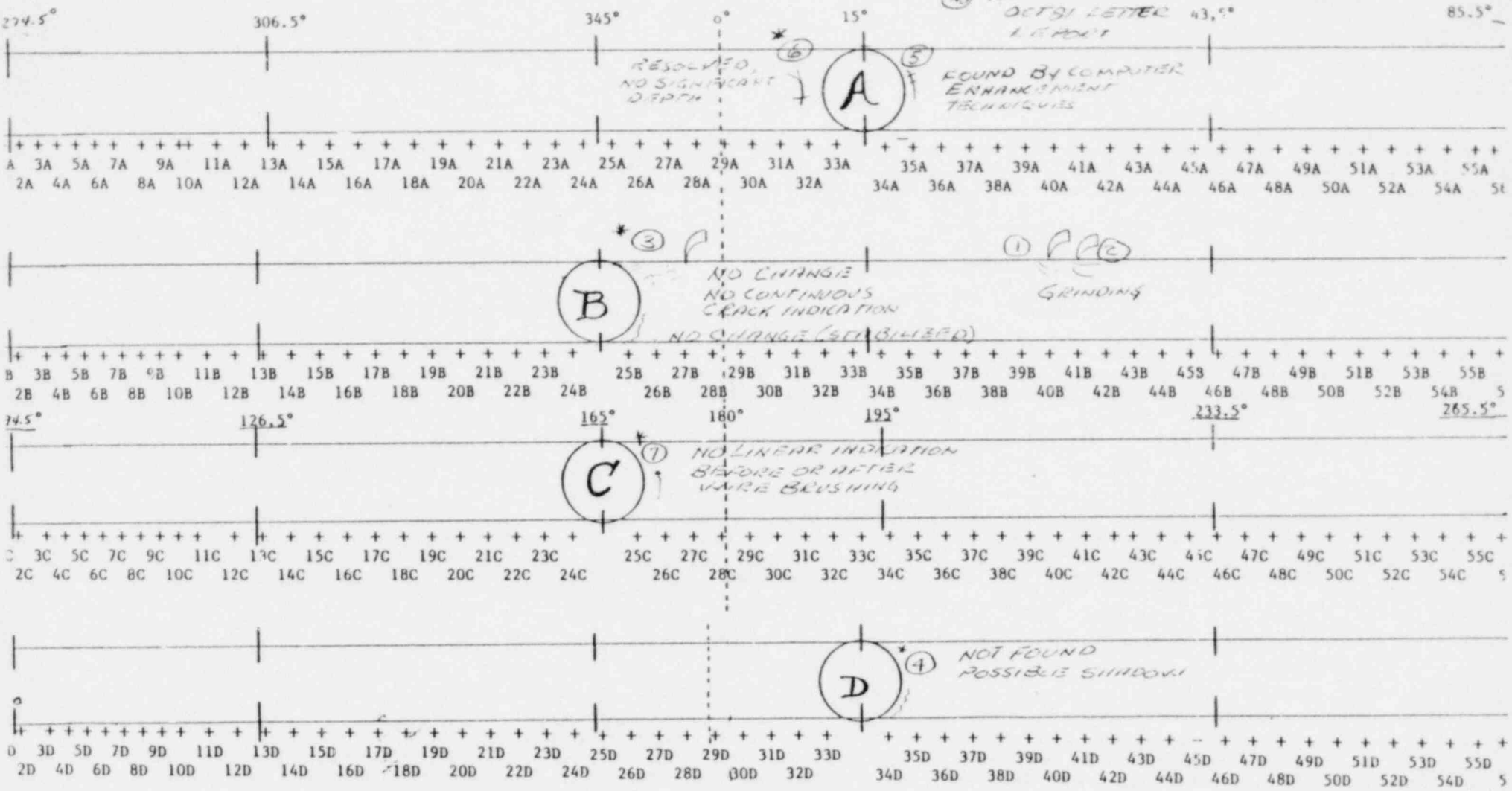
APPENDIX E

REFERENCE SHEETS RELATING 1980 TO 1981

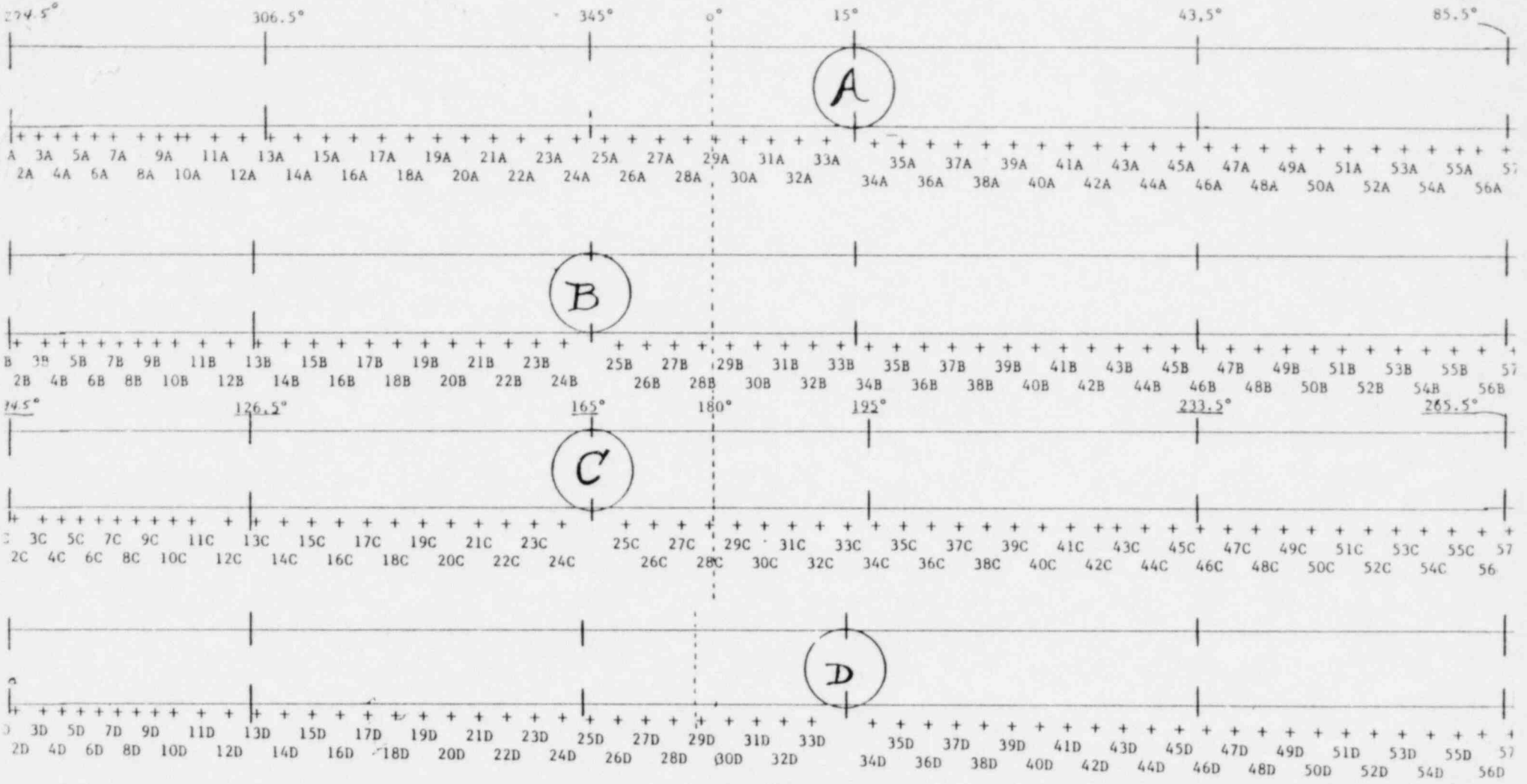
BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION

1980 EXAM * REPORTED ON CNF
1981 LEAK LOOK

(N) REFERS TO SKETCHES IN OCT 81 LETTER



BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION



Sw. R. I. EXAMINATION SUMMARY RECORD

PROJECT No.:	SITE:	SHEET No.:
17-6676	PILGRIM NUCLEAR POWER STATION, UNIT 1	301000
EXAMINATION AREA (SYSTEM / COMPONENT)	**(LINE / SUBASSEMBLY)**	**(IDENTIFICATION)**
REACTOR PRESSURE VESSEL	CORE SPRAY SPARGER NOZZLE	4DB & 4IB

	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER INITIALS	EXAM DATE	INDICATIONS N	I	G	O	RESOLUTION RECORD SHEET No.	CNF No.	REMARKS
VT	INITIAL EXAMINATION	290509	RPS	7/10/81		X			N/A	N/A	REEXAMINATION OF 1980
VT	~~FOLLOW-UP~~ EXAMINATION	290512	RPS	6/10/81		X			N/A	N/A	INDICATIONS REVEALED THE
PT ☐	INITIAL EXAMINATION										SUSPECT AREAS WERE THE
MT ☐	FOLLOW-UP EXAMINATION										RESULT OF GRINDING TO REMOVE
UT	0° LAM SCAN										WELD UNDERCUT. RESOLUTION
	0° WELD SCAN										DETERMINED BY CAMERA ANGLE
	45° SCAN										PREVIOUSLY UNAVAILABLE. EXAMINED
	45° T SCAN										only half of weld due to
	60° SCAN										proximity of Core Shroud
	60° T SCAN										wall

SUMMARIZED BY:	DATE	CONTINUED ON SHEET No.:	
S. L. Ingamells	12 NOV 81	N/A	PAGE 1 OF 1

FORM NO. SWRI 17-30 (REV 1-29-79)

Sw. R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 6 OCT 1981	TIME (24 HR CLOCK): SHEET STARTED 1310; SHEET ENDED 1535	SHEET No: 290512	
EXAMINER: R P Shimkus	SNT LEVEL: III	PROCEDURE No: 900-2 REV. 7 DEV 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE		
ELEMENT NAME: CORE SPRAY SPARGER (TAPES 1 & 2)		LOCATION: LOWER "B" 274° TO 86°		TYPE OF AREA EXAMINED: WELDED & GROUND	

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA OR LENGTH)	REMARKS	INI
			TAPE N°1 COUNT 397-517		"B" SPARGER - CENTER SECTION	RPS
					COUNT 462 HEADER TO PIPE	RPS
					AREA ON 0° SIDE, EXAMINED	RPS
					IN DETAIL ON TAPES N° 8&9	RPS
					NO OTHER SIGNIFICANT INDICATIONS	RPS
			TAPE N°1 COUNT 517-659		"B" SPARGER - LOWER QUADRANT	RPS
					AREA ON 0° SIDE EXAMINED IN	RPS
					DETAIL ON TAPES N° 8&9	RPS
					NO OTHER SIGNIFICANT INDICATIONS.	RPS
			TAPE N°2 COUNT 234-390		"B" SPARGER - UPPER (NOZZLE) QUADRANT	RPS
					HEADER AND NOZZLE 25B	RPS
					EXAMINED IN DETAIL ON	RPS
					TAPES N° 8&9	RPS
					NO OTHER SIGNIFICANT INDICATIONS.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
BACK OF SPARGER PIPING NOT EXAMINED DUE TO VESSEL WALL. RPS

REVIEWED BY	SNT LEVEL	DATE
T. C. Reyer	II	10 OCT 81

FORM No Sw R I NDTR 17-29 (REV 7-31-75)

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 7 OCT 1981	TIME (24 HR CLOCK) SHEET STARTED: 1840 SHEET ENDED: 0130	SHEET No: 290509	
EXAMINER: RP Shimbus	SNT LEVEL: III	PROCEDURE No: 900-2 REV 7 DEV. 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE		
ELEMENT NAME: RE LOOKS OF 1980 EXAM.	LOCATION: SEE BELOW TAPE N° 8		TYPE OF AREA EXAMINED: WELDED & GROUND		

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
1	~~165°~~ RPI 195° "C" SPARGER TOWARDS ~~180°~~ RPI 270°	UPPER SPARGER	ARC STRIKE	EST. 5/16" ϕ	** TAPE COUNT 000-134. 1980 INDICATION FROM ARC STRIKE NOT VISIBLE. WIRE BRUSH AND RELOOK.	RPS
2	~~165°~~ RPI 195° (90° SIDE)	"C" SPARGER	NONE	N/A *	TAPE COUNT 134-187 NO SIGNIFICANT INDICATIONS.	RPS
3	~~345°~~ 15° RPI "D" SPARGER	~~LOWER~~ UPPER RPI SPARGER ~~90°~~ RPI SIDE		*	TAPE COUNT 187-245. NO SIGNIFICANT INDICATIONS	RPS
4	~~345°~~ 15° RPI	~~LOWER~~ UPPER RPI SPARGER	LINEAR	EST. 3/4" **	TAPE COUNT 245-330 TO BE ENHANCED.	RPS
5	345° (90° SIDE) "B" SPARGER	LOWER SPARGER	LINEAR (MANY)	VARIOUS **	TAPE COUNT 330-413. WIRE BRUSH & RELOOK.	RPS
6	15° (270° SIDE) "A" SPARGER	UPPER SPARGER	LINEAR	EST. 1½" **	TAPE COUNT 413-453. TO BE ENHANCED. (NO LONGER SIGNIFICANT)	RPS
7	15° (90° SIDE) "A" SPARGER	UPPER SPARGER		**	TAPE COUNT 453-493. TO BE ENHANCED. (NO LONGER SIGNIFICANT.)	RPS
8	40 & 41 B NOZZLES	LOWER SPARGER	N/A	N/A *	TAPE COUNT 493-548. NO LONGER SIGNIFICANT, GRINDING.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
FAR SIDE OF SPARGER PIPING NOT EXAMINED DUE TO VESSEL WALL. CONTINUED ON 290510 RPS

REVIEWED BY	SNT LEVEL	DATE
L. C. Reaves	II	10 OCT 81

FORM No. Sw.R.I. NDTR 17-29 (REV 7-31-75)

Sw. R. I. EXAMINATION SUMMARY RECORD

PROJECT No.:	SITE:	SHEET No.:
17-6676	PILGRIM NUCLEAR POWER STATION, UNIT 1	301001

EXAMINATION AREA (SYSTEM / COMPONENT)	(LINE / SUBASSEMBLY)	(IDENTIFICATION)
REACTOR PRESSURE VESSEL	CORE SPRAY SPARGER JUNCTION BOX to PIPE	345° to NOZ 25B

	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER INITIALS	EXAM DATE	INDICATIONS N	I	G	O	RESOLUTION RECORD SHEET No.	CNF No.	REMARKS
VT	INITIAL EXAMINATION	Z90509	RPS	7/10/81				X	N/A	N/A	RE EXAMINATION OF THE 1980
VT	FOLLOW-UP EXAMINATION										~~HOT~~ LINEAR INDICATION
PT ☐	INITIAL EXAMINATION										REVEALED NO APPARENT CHANGE
MT ☐	FOLLOW-UP EXAMINATION										AND THAT THE CRACK HAD
UT	0° LAM SCAN										STABILIZED. — EXAMINED
UT	0° WELD SCAN										ONLY HALF OF WELD DUE
UT	45° SCAN										TO PROXIMITY OF CORE
UT	45° T SCAN										SHROUD WALL
UT	60° SCAN										
UT	60° T SCAN										

SUMMARIZED BY:	DATE	CONTINUED ON SHEET No.:	
H Ingamells	12 NOV 81	NA	PAGE 1 OF 1

FORM NO. SWRI 17-30 (REV 1-29-79)

Sw. R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 7 OCT 1981	TIME (24 HR CLOCK): SHEET STARTED 1740; SHEET ENDED 0120	SHEET No: 290509	
EXAMINER: R.P. Shimbus	SNT LEVEL: III	PROCEDURE No: 900-2 REV 7 DEV. 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN): ☐ DIRECT ☒ REMOTE SEE ABOVE		
ELEMENT NAME: RE LOOKS OF 1980 EXAM.	LOCATION: SEE BELOW TAPE N° 8		TYPE OF AREA EXAMINED: WELDED & GROUND		

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
1	~~165°~~ 195° "C" SPARGER TOWARDS ~~180°~~ 210°	UPPER SPARGER	ARC STRIKE	EST. 5/16" ϕ	** TAPE COUNT 000-134. 1980 INDICATION FROM ARC STRIKE NOT VISIBLE. WIRE BRUSH AND RELOOK.	RPS RPS RPS
2	~~165°~~ 195° (90° SIDE)	"C" SPARGER	NONE	N/A *	TAPE COUNT 134-187 NO SIGNIFICANT INDICATIONS.	RPS RPS
3	~~345°~~ 15° RPS "B" SPARGER	~~UPPER AND LOWER~~ SPARGER RPS 90° SIDE		*	TAPE COUNT 187-245. NO SIGNIFICANT INDICATIONS	RPS RPS
4	~~345°~~ 15° RPS	~~UPPER AND LOWER~~ SPARGER	LINEAR	EST. 3/4" **	TAPE COUNT. 245-330 TO BE ENHANCED	RPS
5	345° (90° SIDE) "B" SPARGER	LOWER SPARGER	LINEAR (MANY)	VARIOUS **	TAPE COUNT 330-413. WIRE BRUSH & RELOOK.	RPS RPS
6	15° (270° SIDE) "A" SPARGER	UPPER SPARGER	LINEAR	EST. 1½" **	TAPE COUNT 413-453. TO BE ENHANCED. (NO LONGER SIGNIFICANT)	RPS RPS
7	15° (90° SIDE) "A" SPARGER	UPPER SPARGER		**	TAPE COUNT 453-493. TO BE ENHANCED. (NO LONGER SIGNIFICANT)	RPS RPS
8	40 & 41 B NOZZLES	LOWER SPARGER	N/A	N/A *	TAPE COUNT 493-548. NO LONGER SIGNIFICANT, GRINDING.	RPS RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
FAR SIDE OF SPARGER PIPING NOT EXAMINED DUE TO VESSEL WALL. CONTINUED ON 290510

REVIEWED BY	SNT LEVEL	DATE
J C Keene	II	10 OCT 81

FORM No Sw R I NDTR 17-29 (REV 7-31-75)

Sw. R. I. EXAMINATION SUMMARY RECORD

PROJECT No.:	SITE:	SHEET No.:
17-6676	PILGRIM NUCLEAR POWER STATION, UNIT 1	30100Z
EXAMINATION AREA (SYSTEM / COMPONENT)	**(LINE / SUBASSEMBLY)**	**(IDENTIFICATION)**
REACTOR PRESSURE VESSEL	CORE SPRAY SPARGER	165° HEADER

	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER INITIALS	EXAM DATE	INDICATIONS N	I	G	O	RESOLUTION RECORD SHEET No.	CNF No.	REMARKS
VT	INITIAL EXAMINATION	290509	RPS	7/10/81		X			N/A	N/A	RE EXAMINATION OF THE 1980
VT	FOLLOW-UP EXAMINATION										INDICATIONS REVEALED NO
PT ☐	INITIAL EXAMINATION										CURRENT INDICATIONS. SUSPECTED
MT ☐	FOLLOW-UP EXAMINATION										THAT 1980 INDICATION WAS
UT	0° LAM SCAN										A SHADOW. IMPROVED LIGHTING
UT	0° WELD SCAN										ENABLED BETTER OBSERVATION
UT	45° SCAN										- EXAMINED ONLY HALF OF WELD
UT	45° T SCAN										DUE TO PROXIMITY OF CORE
UT	60° SCAN										SHROUD WALL
UT	60° T SCAN										

SUMMARIZED BY:	DATE	CONTINUED ON SHEET No.:	
S K Ingamells	12 NOV 81	N/A	PAGE 1 OF 1

FORM NO. SWRI 17-30 (REV 1-29-79)

Sw. R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 7 OCT 1981	TIME (24 HR CLOCK) SHEET STARTED: 1240 SHEET ENDED: 0130	SHEET No: 290509	
EXAMINER: R.F. Shimbua	SNT LEVEL: III	PROCEDURE No: 900-2 REV: 7 DEV. 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE		
ELEMENT NAME: RE LOOKS OF 1980 EXAM.	LOCATION: SEE BELOW TAPE N° 8		TYPE OF AREA EXAMINED: WELDED & GROUND		

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
1	~~165°~~ RPI 195° "C" SPARGER TOWARDS ~~180°~~ RPI 270°	UPPER SPARGER	ARC STRIKE	EST. 5/16" ϕ **	TAPE COUNT 000-134. 1980 INDICATION FROM ARC STRIKE NOT VISIBLE. WIRE BRUSH AND RELOOK.	KFS KFS KFS
2	~~195°~~ RPI (90° SIDE)	"C" SPARGER	NONE	N/A *	TAPE COUNT 134-187 NO SIGNIFICANT INDICATIONS.	KFS KFS
3	~~345°~~ 15° RPI "B" SPARGER	~~LOWER~~ UPPER SPARGER		*	TAPE COUNT 187-245. NO SIGNIFICANT INDICATIONS	KFS KFS
4	345° 15° RPI	~~LOWER~~ UPPER SPARGER	LINEAR	EST. 3/4" **	TAPE COUNT. 245-330 TO BE ENHANCED	KFS
5	345° (90° SIDE) "B" SPARGER	LOWER SPARGER	LINEAR (MANY)	VARIOUS **	TAPE COUNT 330-413. WIRE BRUSH & RELOOK.	KFS KFS
6	15° (270° SIDE) "A" SPARGER	UPPER SPARGER	LINEAR	EST. 1/2" **	TAPE COUNT 413-453. TO BE ENHANCED. (NO LONGER SIGNIFICANT)	KFS KFS
7	15° (90° SIDE) "A" SPARGER	UPPER SPARGER		**	TAPE COUNT 453-493. TO BE ENHANCED. (NO LONGER SIGNIFICANT)	KFS KFS
8	40 & 41 B NOZZLES	LOWER SPARGER	N/A	N/A *	TAPE COUNT 493-548. NO LONGER SIGNIFICANT, GRINDING.	KFS KFS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
FAR SIDE OF SPARGER PIPING NOT EXAMINED DUE TO VESSEL WALL. CONTINUED ON 290510

REVIEWED BY	SNT LEVEL	DATE
T C Reaves	II	10 OCT 81

FORM No. Sw R I NDTR 17-29 (REV. 7-31-75)

Sw. R. I. EXAMINATION SUMMARY RECORD

PROJECT No.:	SITE:	SHEET No.:
17-6676	PILGRIM NUCLEAR POWER STATION, UNIT 1	301003

EXAMINATION AREA (SYSTEM / COMPONENT)	(LINE / SUBASSEMBLY)	(IDENTIFICATION)
REACTOR PRESSURE VESSEL	CORE SPRAY SPARGER "A" SPARGER	15° HEADER

	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER INITIALS	EXAM DATE	INDICATIONS N	I	G	O	RESOLUTION RECORD SHEET No.	CNF No.	REMARKS
VT	INITIAL EXAMINATION	290514	RPS	10/11/81				X	N/A	N/A	REEXAMINATION OF THE 1980 INDICATION CONFIRMED, USING COMPUTER ENHANCED TECHNIQUES, HEAT AFFECTED ZONE CRACK IN THE LOWER QUADRANT — EXAMINED ONLY HALF OF WELD DUE TO PROXIMITY OF CORE SHROUD WALL
VT	FOLLOW-UP EXAMINATION										
PT ☐	INITIAL EXAMINATION										
MT ☐	FOLLOW-UP EXAMINATION										
UT	0° LAM SCAN										
UT	0° WELD SCAN										
UT	45° SCAN										
UT	45° T SCAN										
UT	60° SCAN										
UT	60° T SCAN										

SUMMARIZED BY:	DATE	CONTINUED ON SHEET No.:	
J C Iyanello	12 NOV 81	N/A	PAGE 1 OF 1

FORM NO. SWRI 17-30 (REV 1-29-79)

Sw. R. I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No. 17-6676	SITE: PILGRIM I	DATE (DAY-MON-YR): 10 NOV 81	TIME (24 HR CLOCK): SHEET STARTED 1310, SHEET ENDED 1330	SHEET No. 290514
EXAMINER: R. P. SHIMKUS	SNT LEVEL: III	PROCEDURE No. 900-7 REV 7 Rev-1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS	
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE REMOTE TV	
ELEMENT NAME: CORE SPRAY SPARGER	LOCATION: "A" JUNCTION BOX - "A" SPARGER		TYPE OF AREA EXAMINED: WELDED & GROUND	

IND No.	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
1	15°	UPPER SPARGER	LINEAR	EST. 3" PLUS	HEAT AFFECTED ZONE CRACK AT TOE OF JUNCTION BOX TO PIPE WELD. STARTS AT APPROXIMATELY 4 O'CLOCK AND EXTENDS DOWNWARD AND OUT OF VIEW. RESOLUTION FROM FIGURE A-2, COMPUTER ENHANCED TAPE IMAGE FROM 1981 EXAMINATION.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
EXAMINATION LIMITED BY VESSEL (CORE SHROUD) WALL. RPS

REVIEWED BY	SNT LEVEL	DATE
R. C. Reason	II	10 NOV 81

FORM No. Sw R I. NDTR 17-29 (REV. 7-31-75)

Sw. R. I. EXAMINATION SUMMARY RECORD

PROJECT No.:	SITE:	SHEET No.:
17-6676	PILGRIM NUCLEAR POWER STATION, UNIT 1	301004
EXAMINATION AREA (SYSTEM / COMPONENT)	**(LINE / SUBASSEMBLY)**	**(IDENTIFICATION)**
REACTOR PRESSURE VESSEL	CORE SPRAY SPARGER "A" SPARGER	270°

	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER INITIALS	EXAM DATE	INDICATIONS N	I	G	O	RESOLUTION RECORD SHEET No.	CNF No.	REMARKS
VT	INITIAL EXAMINATION	290505	RPS	6/10/81		X					REEXAMINATION OF 1980
VT	FOLLOW-UP EXAMINATION										INDICATIONS WAS RESOLVED
PT ☐	INITIAL EXAMINATION										AS INSIGNIFICANT
MT ☐	FOLLOW-UP EXAMINATION										
UT	0° LAM SCAN										
UT	0° WELD SCAN										
UT	45° SCAN										
UT	45° T SCAN										
UT	60° SCAN										
UT	60° T SCAN										

SUMMARIZED BY:	DATE	CONTINUED ON SHEET No.:	
H Inamdar	12 NOV 81	N/A	PAGE 1 OF

FORM NO. SWRI 17-30 (REV 1-29-79)

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No. 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 6 OCT 1981	TIME (24 HR CLOCK): SHEET STARTED 1410; SHEET ENDED 2300	SHEET No. 290505	
EXAMINER: R.P. Shimkus	SNT LEVEL: III	PROCEDURE No. 900-2 REV. 7-DEV.1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE		
ELEMENT NAME: CORE SPRAY SPARGER (TAPE N°3)	LOCATION: UPPER SPARGER 274°-86° "A"		TYPE OF AREA EXAMINED: WELDED & GROUND		

IND No.	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI.
			TAPE N°3 COUNT	000-212	"A" SPARGER - LOWER (NOZZLE) QUADRANT.	RPS
					NO SIGNIFICANT INDICATIONS.	RPS
			TAPE N°3 COUNT	212-357	"A" SPARGER - CENTER SECTION	RPS
					NO SIGNIFICANT INDICATIONS.	RPS
			TAPE N°3 COUNT	357-530	"A" SPARGER - UPPER QUADRANT	RPS
					NO SIGNIFICANT INDICATIONS.	RPS
			TAPE N°4 COUNT	528-586	REEXAMINATION "A" LOWER QUADRANT.	RPS
					EXAMINATION UNACCEPTABLE - REPEATED	RPS
					SEE BELOW	RPS
			TAPE N°4 COUNT	587-696	REEXAMINATION "A" LOWER (NOZZLE)	RPS
					QUADRANT WITH IMPROVED ANGLE.	RPS
					PIPE INDICATIONS AT WELDOLET	RPS
					TOES RESOLVED AS GRINDING	RPS
					TO REMOVE WELD UNDERCUT.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
NO EXAMINATION OF BACK SIDE OF SPARGER DUE TO VESSEL WALL. RPS

REVIEWED BY:	SNT LEVEL	DATE
R.C. Reaves	II	10 OCT 81

FORM No. Sw.R.I. NDTR 17-29 (REV. 7-31-75)

Sw. R. I. EXAMINATION SUMMARY RECORD

PROJECT No.:	SITE:	SHEET No.:
17-6676	PILGRIM NUCLEAR POWER STATION, UNIT 1	301005
EXAMINATION AREA (SYSTEM / COMPONENT)	**(LINE / SUBASSEMBLY)**	**(IDENTIFICATION)**
REACTOR PRESSURE VESSEL	CORE SPRAY SPARGER "C" SPARGER	195°

	EXAMINATION TYPE	EXAMINATION RECORD SHEET No.	EXAMINER INITIALS	EXAM DATE	INDICATIONS N	I	G	O	RESOLUTION RECORD SHEET No.	CNF No.	REMARKS
VT	INITIAL EXAMINATION	290506	RPS	6/10/81	X				N/A	N/A	REEXAMINATION OF 1980
VT	~~FOLLOW-UP~~ EXAMINATION	290510	RPS	7/10/81	X				N/A	N/A	INDICATION REVEALED NO
PT ☐	INITIAL EXAMINATION										CURRENT INDICATION.
MT ☐	FOLLOW-UP EXAMINATION										AREA WAS WIRE BRUSHED
UT	0° LAM SCAN										DURING REEXAMINATION
	0° WELD SCAN										AND NO INDICATION COULD
	45° SCAN										BE FOUND
	45° T SCAN										
	60° SCAN										
	60° T SCAN										

SUMMARIZED BY:	DATE	CONTINUED ON SHEET No.:	
S E Ingamells	12 NOV 81	N/A	PAGE 1 OF 1

FORM NO. SWRI 17-30 (REV 1-29-79)

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No. 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR.): 6 OCT 1981	TIME (24 HR CLOCK): SHEET STARTED 1620, SHEET ENDED 2300	SHEET No. 290506
EXAMINER: R.P. Shimkus	SNT LEVEL: III	PROCEDURE No. 900-2 REV. 7 DEV 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS	
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE	
ELEMENT NAME: CORE SPRAY SPARGER (TAPE N°4)	LOCATION: UPPER SPARGER 94° TO 266° "C"		TYPE OF AREA EXAMINED: WELDED & GROUND	

IND No.	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI.
1	126,5°	N/A	LINEAR	EST. 1/2"	ON 90° SIDE OF SPARGER	RPS
			TAPE N°4 COUNT	RPI 206-252-415	SUPPORT BRACKET. UPPER QUADRANT	RPS
					RELOOK FOR RESOLUTION	RPS
					SEE CENTER SECTION OF	RPS
					SPARGER PIPE EXAMINATION. *	RPS
			TAPE N°4 COUNT	000-252	TOP SECTION - NO SIGNIFICANT	RPS
					INDICATIONS.	RPS
			TAPE N°4 COUNT	415-528	BOTTOM SECTION - WELDOLETS -	RPS
					NO SIGNIFICANT INDICATIONS.	RPS
					* SEE TAPE N° 8	RPS
					COUNT 587-624	RPS
					DATA SHEET 290510	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
NO EXAMINATION OF BACK SIDE OF SPARGER DUE TO VESSEL WALL. RPS

REVIEWED BY:	SNT LEVEL	DATE
R.C. Leaver	II	10 OCT 81

FORM No. SwRI NDTR 17-29 (REV. 7-31-75)

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 7 OCT 81	TIME (24 HR CLOCK) SHEET STARTED: 1845 SHEET ENDED: 0136	SHEET No. 290510
EXAMINER: R.P. Shimkus	SNT LEVEL: III	PROCEDURE No. 900-2 REV. 7 DATED 1/77	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS	
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE	
ELEMENT NAME: RELOOKS 1980 EXAMINATION #1981	LOCATION: SEE BELOW TAPE N°8		TYPE OF AREA EXAMINED: WELDED & GROUND	

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
9	345° (90° SIDE) "B" SPARGER 1981	LOWER SPARGER	LINEAR - MANY	VARIOUS **	TAPE COUNT 548 – 565. RELOOKED FOR ENHANCEMENT PURPOSES. LINEAR INDICATIONS	RPS RPS RPS
10	NOZZLE 13A	UPPER SPARGER	LINEAR ON PIPE	EST. 1" *	TAPE COUNT 565 – 576 TO BE ENHANCED FOR RESOLUTION	RPS RPS
				*	TAPE COUNT 576 – 587 TO BE	RPS
11	16-17A NOZZLE	UPPER SPARGER	LINEAR ON PIPE	EST. 1"	ENHANCED FOR RESOLUTION.	RPS
12	126° (90° SIDE) BRACKET	UPPER SPARGER "C" RB	LINEAR ~~LIN~~ ON PIPE	* EST. 1"	TAPE COUNT 587 – 624 TO BE ENHANCED FOR RESOLUTION	RPS RPS
	** SEE TAPE N° 10		RPS	*	INDICATIONS RESOLVED AS NOT SIGNIFICANT. NO FURTHER ACTION REQUIRED.	RPS RPS RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE):
BACK SIDE OF SPARGER PIPING NOT EXAMINED DUE TO VESSEL WALL. RPS

REVIEWED BY	SNT LEVEL	DATE
R.C. Pearce	II	10 OCT 81

FORM No. Sw.R.I. NDTR 17-29 (REV. 7-31-75)

Sw. R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 7 OCT. 1981	TIME (24 HR CLOCK) SHEET STARTED: 0700 SHEET ENDED: 0915	SHEET No 290507
EXAMINER: R.P. Shimkus	SNT LEVEL: III	PROCEDURE No 900-2 REV 7-DEV 1	VISUAL AIDS (IF YES DESCRIBED) ☒ YES ☐ NO REMOTE TV & LIGHTS	
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE	
ELEMENT NAME: CORE SPRAY PIPING FOR "A" & "D" SPARGERS	LOCATION: "A" & "D" SPARGER PIPING (TAPE N°5)		TYPE OF AREA EXAMINED: WELDED & GROUND	

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA OR LENGTH)	REMARKS	INI
			TAPE N°5	TAPE COUNT 000	WELDS A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-8, A-9, A10 ON THE "A" PIPING ~~ELL~~ AD. NO SIGNIFICANT INDICATIONS NOTED.	RPS
			TAPE N°5	TAPE COUNT 511	"D" PIPING, WELDS D-10, D-9, D-8, D-7, D-6, D-5, D-4, D-3, D-2, D-1 NO SIGNIFICANT INDICATIONS NOTED.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE):
VESSEL WALL PREVENTED EXAMINATION OF PIPING & WELDS ON THAT SIDE. RPS

REVIEWED BY:	SNT LEVEL	DATE
R. C. Reavis	II	10 OCT 81

FORM No. SwRI NDTR 17-29 (REV. 7-31-75)

Sw. R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No. 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR): 7 OCTOBER 1981	TIME (24 HR CLOCK) SHEET STARTED: 0920 SHEET ENDED: 1045	SHEET No. 290508
EXAMINER: K.P. Shanahan	SNT LEVEL: III	PROCEDURE No. 900-2 REV 7 DEV 1	VISUAL AIDS (IF YES DESCRIBED) ☒ YES ☐ NO REMOTE TV & LIGHTS	
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE	
ELEMENT NAME: CORE SPRAY PIPING FOR "B" & "C" SPARGERS	LOCATION: "B" & "C" SPARGER PIPING (TAPE N°6)	TYPE OF AREA EXAMINED: WELDS & GROUND		

IND No.	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
				TAPE N°6 COUNT 000	PIPING WELDS AND PIPING EXAMINED B-1 THROUGH B-10. NO SIGNIFICANT INDICATIONS NOTED.	RJS RJS RJS
				TAPE COUNT 410	PIPING WELDS AND PIPING EXAMINED C-10 THROUGH C-1. NO SIGNIFICANT INDICATIONS NOTED.	RJS RJS RJS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE):
VESSEL WALL PREVENTED EXAMINATION OF PIPING & WELDS ON THAT SIDE RJS

REVIEWED BY:	SNT LEVEL	DATE
R. C. Keaver	II	10 OCT 81

FORM No. Sw.R.I. NDTR 17-29 (REV. 7-31-75)

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: Pilgrim Station	DATE (DAY-MON-YR.): 6 OCT 1981	TIME (24 HR CLOCK) SHEET STARTED: 1310 RP; SHEET ENDED: 1525 RP	SHEET No: 290511	
EXAMINER: R.P. Shimkus	SNT LEVEL: III	PROCEDURE No: 900-2 REV 7 DEV 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE SEE ABOVE		
ELEMENT NAME: CORE SPRAY SPARGER (TAPE N° 1 & 2)	LOCATION: LOWER "D" 94° TO 266°	TYPE OF AREA EXAMINED: WELDED & GROUND			

IND No.	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
		TAPE N° 1	TAPE COUNT 000	-300	"D" SPARGER LOWER QUADRANT - NO SIGNIFICANT INDICATIONS.	RPS
		TAPE N° 1	TAPE COUNT 300	-397	"D" SPARGER CENTER SECTION - NO SIGNIFICANT INDICATIONS.	RPS
		TAPE N° 2	TAPE COUNT 000	-234	"D" SPARGER - UPPER (NOZZLE) QUADRANT. NO SIGNIFICANT INDICATIONS.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE)
BACK SIDE OF SPARGER PIPING NOT EXAMINED DUE TO VESSEL WALL. RPS

REVIEWED BY	SNT LEVEL	DATE
R C Reaves	II	10 OCT 81

FORM No. Sw.R.I. NDTR 17-29 (REV 7-31-75)

Sw.R.I. VISUAL EXAMINATION RECORD FOR REACTOR INTERNALS

PROJECT No: 17-6676	SITE: PILGRIM I		DATE (DAY-MON-YR): 10 NOV 81	TIME (24 HR CLOCK): SHEET STARTED 1330; SHEET ENDED 1350	SHEET No: 290513
EXAMINER: R P SHIMKUS	SNT LEVEL: III	PROCEDURE No 900-2 REV 7 DEV. 1	VISUAL AIDS (IF YES DESCRIBED): ☒ YES ☐ NO REMOTE TV & LIGHTS		
EXAMINER: N/A	SNT LEVEL: N/A		METHOD: (IF REMOTE EXPLAIN) ☐ DIRECT ☒ REMOTE REMOTE TV		
ELEMENT NAME: CORE SPRAY SPARGER	LOCATION: NOZZLE 9B ON SPARGER PIPE		TYPE OF AREA EXAMINED: WELDED & GROUND		

IND No	LOCATION AZIMUTH	LOCATION ELEVATION	TYPE OF INDICATION (ROUND / LINEAR)	SIZE (DIA. OR LENGTH)	REMARKS	INI
			No SIGNIFICANT		INDICATIONS.	RPS
					APPARENT INDICATION IS	RPS
					NORMAL WELD TOE CONDITION.	RPS

EXAMINATION AREA LIMITATION (IF NONE, SO STATE):
EXAMINATION LIMITED BY VESSEL (CORE SHROUD) WALL. RPS

REVIEWED BY:	SNT LEVEL	DATE
T. C. Rowe	II	10 NOV 81

FORM No. Sw.R.I. NDTR 17-29 (REV. 7-31-75)

Boston Edison Company

Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, Massachusetts 02360

November 6, 1981

Southwest Research Institute
6220 Culebra Road
San Antonio, Texas 78284

ATTN: Mr. W. T. Flach

Dear Mr. Flach:

Enclosed please find copies of photographs taken from the video tapes of the 1981 remote visual examination. Please evaluate these indications as soon as possible.

If you should have any questions please contact me immediately.

Sincerely,

F N Famulari

F. N. Famulari
Operations Q.C. Group Leader

FNF/pb
encl.

SEE DATA SHEETS
290513 & 290514 for
ANALYSIS

JCL
16 NOV 81

APTECH ENGINEERING
SERVICES, INC.
795 SAN ANTONIO ROAD
PALO ALTO, CALIFORNIA 94303

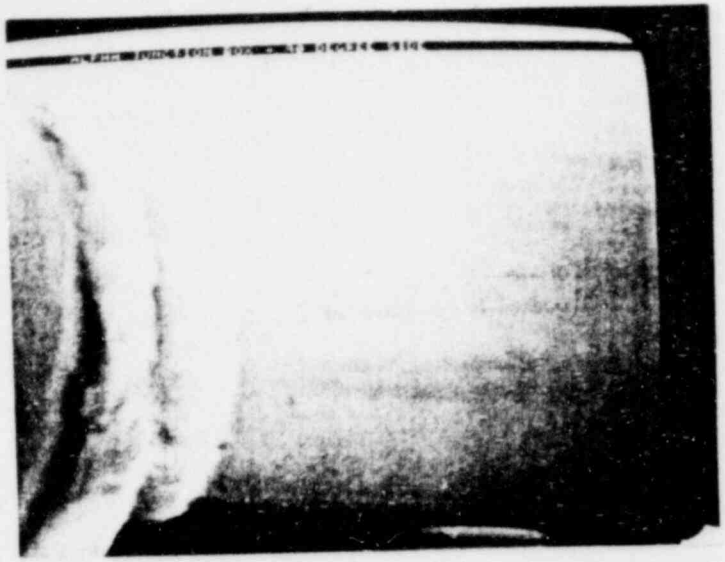


Figure A-1 1981 Original of "A" Juncture Box. Indication in HAZ Appears to Start From Arc Strike Mark at About 5 o'clock and Runs to 4 o'clock.

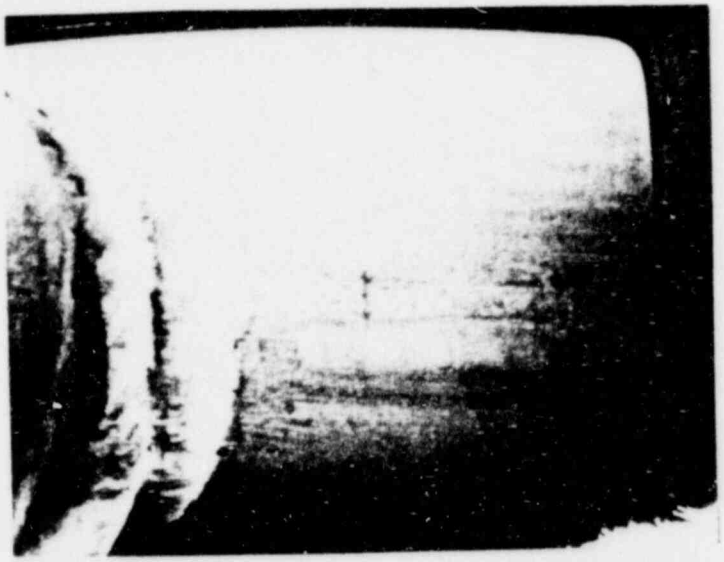


Figure A-2 1981 Enhancement of Same Area Shown on Figure A-1.

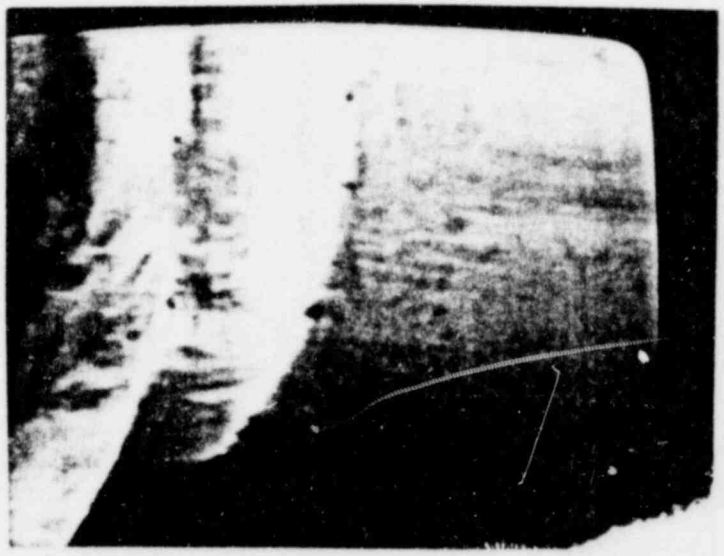


Figure A-3 1981 Enhancement and Expansion (4x) of Figure A-2.

APTECH ENGINEERING
SERVICES, INC.
795 SAN ANTONIO ROAD
PALO ALTO, CALIFORNIA 94303

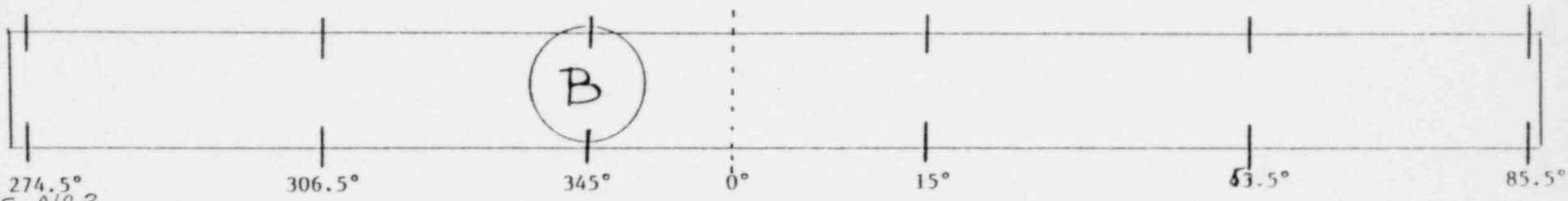
Figure B-1 1981 Original of Nozzle 41B. Camera Looking Down (Almost Vertical).

Figure B-2 1981 Enhancement of Same Area Shown on Figure B-1. Possible Crack Indication in HAZ Along Fillet Weld Toe From About 4 o'clock to 5 o'clock.

BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

FOR RELOOK

REPORT 274° - 86° OF B ~~RD~~ SPARGER



TAPE N°2

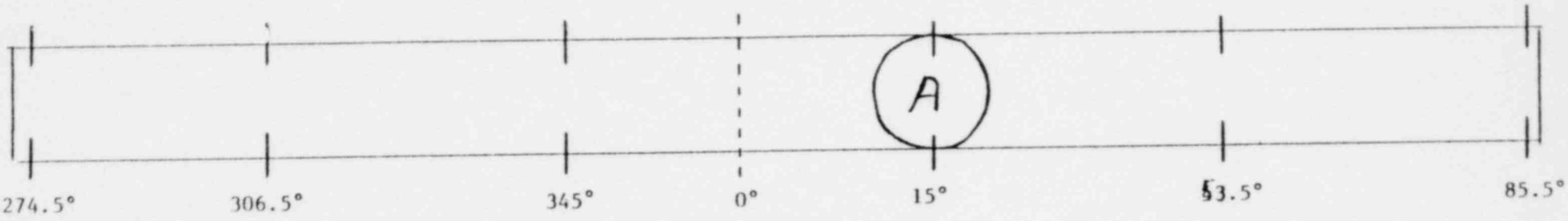
(1) NOZZLE 22B FINE LINEAR INDICATION AT 3 O'CLOCK EXTENDING NEARLY PARALLEL TO THE SPARGER PIPING FROM THE TOE OF THE NOZZLE TO PIPE WELD.
(2) 345° JUNCTION BOX, BOTH SIDES. RIGHT SIDE (TOWARDS 90°) - LINEAR INDICATIONS EXTENDING TO NOZZLE 25B.
(3) NOZZLE 40B - LINEAR INDICATIONS AT 6 O'CLOCK
(4) NOZZLE 41B - SIMILAR TO INDICATION N°3

TAPE N°1

(1) JUNCTION BOX 345°. SEE INDICATION 2 ABOVE
(2) NOZZLE 33B BETWEEN NOZZLE AND BRACKET - FINE LINEAR INDICATION EXTEXIDING APPROX 45° UPWARD AND TO THE RIGHT. (DETERMINE IF INDICATION EXTENDS OVER TOP OF PIPE.)
(3) NOZZLE 35B - SHORT HEAVY VERTICAL LINEAR INDICATION (MAY BE ON WELD IF WELDE PIPE WAS USED.)
(4) NOZZLE 44B SHORT TRANSVERSG LINEAR INDICATION OF MODERATE WIDTH.
~~(5) NOZZLE 34B HEAVY TRANSVE INDICATION~~

BOSTON EDI[illegible] COMPANY
PILGRIM NUCLEA[illegible]OWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT _____ OF _____



TAPE N°3

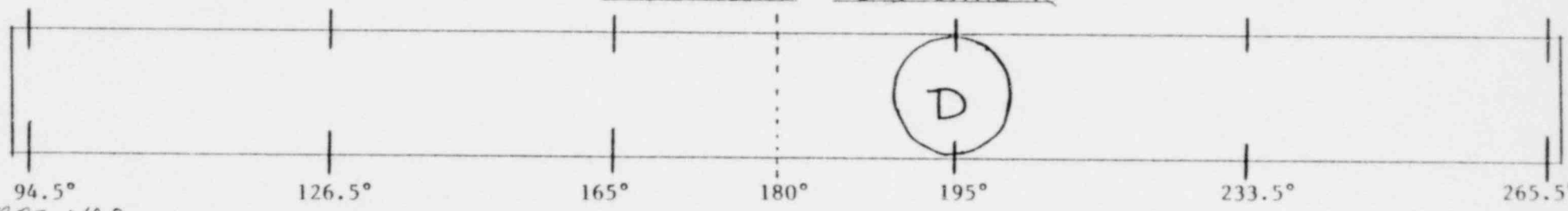
(1) NOZZLE 19A FINE LINEAR INDICATIONS AT SPARGER PIPE TO NOZZLE WELD ON PIP.
(2) NOZZLE 24A HEAT AFFECTED ZONE (HAZ) INDICATION ~~AT~~ AT PIPE TO NOZZLE WELD ON PIPE. HEAVIER INDICATIONS THAN INDICATION 1 ABOVE.
(3) NOZZLE 25A HAZ INDICATION SIMILAR TO INDICATION 2 ABOVE.
(4) NOZZLE 27A HAZ INDICATION SIMILAR TO INDICATION 2 ABOVE BUT SHORTER.
(5) NOZZLE 30A HAZ INDICATION TAILS OUT PARALLEL TO PIPE AXIS TOWARDS NOZZLE 31A.
(6) NOZZLE 31A HAZ INDICATION TAILS OUT PARALLEL TO PIPE AXIS TOWARDS NOZZLE 30A.
(7) NOZZLE 32A HAZ INDICATION TAILS OUT PARALLEL TO PIPE AXIS TOWARDS NOZZLE 31A
(8) " 36A " " " " " " " " " " 37A
(9) " 38A " " " " " " " " " " 37A
~~8~~ (10) " 41A " " LOOPS 'AWAY' FROM WELD TOE & RETURNS
(11) " 42A " " " " " " " "
(12) " 50A " " PARALLEL TO PIPE AXIS THROUGH TOE OF PIPE TO ~~WELD~~ NOZZLE WELD.
*(13) " 14A CENTER OF PIPE SMALL ~~FINE~~ SHARP TRANSVERSE INDICATION ON PIPE
*(14) " 16A " " " SHARP TRANSVERSE INDICATION ON PIPE
*(15) JUNCTION BOX 15° BOX TO PIPE WELD, LINEAR INDICATION LOWER QUADRANT HAZ.
(16) NOZZLE 33A AREA ON PIPE, TAPE COUNT 358, RETAKE OF 1980 INSPECTION
*(17) 15° JUNCTION BOX TAPE COUNT 452, SHARP LINEAR INDICATION IN HAZ OF J-BOX TO PIPE WELD

END OF "A" SPARGER AT COUNT 534.

FOR RELOOK

BOSTON E[illegible] COMPANY
PILGRIM NUCLEAR POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT 94°–266° OF 2D SPARGER



TAPE N°2

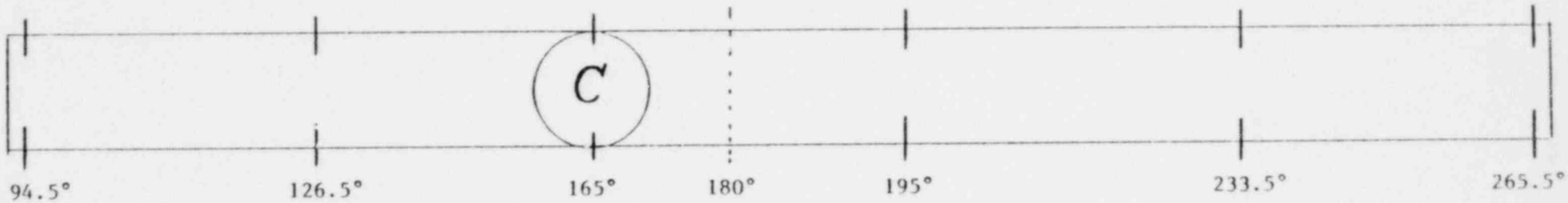
① NOZZLE 29D LINEAR INDICATION AT APPROX. 8 O'CLOCK EXTENDING RADIALLY FROM WELDOLET TO SPARGER PIPE WELD ON THE SPARGER PIPE. APPEARS ALSO ON RIGHT SIDE OF NOZZLE PARALLEL TO SPARGER PIPE AXIS.
② JUNCTION BOX TO SPARGER PIPE WELD ON THE PIPE – LINEAR INDICATION AT HEAT AFFECTED ZONE (HAZ) BOTH SIDES OF JUNCTION BOX.
③ NOZZLE 36D SIMILAR TO INDICATION N°1.
④ NOZZLE 40D SIMILAR TO INDICATION N°3
⑤ NOZZLE 43D SIMILAR TO INDICATION N°3 & 4
⑥ NOZZLE 43D " " " N°3, 4 & 5

TAPE N°1

① 194° JUNCTION BOX TO PIPE WELDS, BOTH SIDES, SHADOWS OBSCURE AREA OF INTREST

BOSTON EDISON COMPANY
PILGRIM NUC[illegible] POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT _____ OF _____



TAPE N° 4

*① TAPE COUNT 092 ON 90° SIDE OF 126.5° BRACKET VERY FINE SHARP INDICATION TRANSVERSE TO PIPE

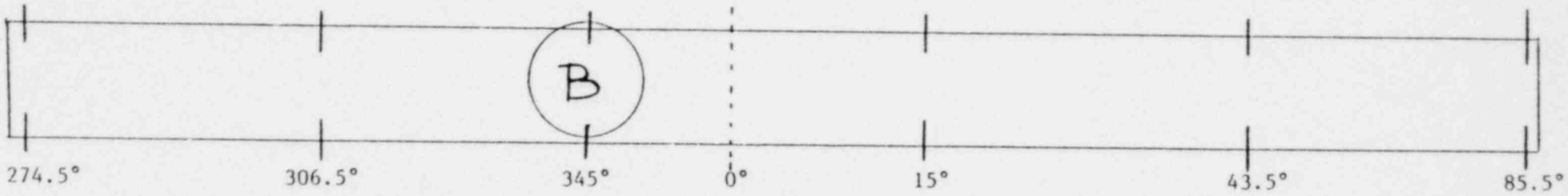
CENTER OF SPARGER STARTS AT COUNT 257
SPARGER TO SPRAY NOZZLE STARTS AT COUNT 420

②	NOZZLE 4C	PIPE TO NOZZLE WELD, HAZ AREA LINEAR INDICATIONS ON PIPE
③	" 6C	" " " " " " " " " "
④	" 7C	" " " " " " " " " "
⑤	" 8C	" " " " " " " " " "
⑥	" 25C	" " " " " " " " " "
⑦	30C	
⑧	31C	
⑨	32C	
⑩	35C	
⑪	36C	
⑫	C 524 52C	
13	C 525 53C	

Nozzle 53C marked on grinding at toe of sparger pipe to nozzle weld

BOSTON E[illegible]N COMPANY
PILGRIM NUCL[illegible] POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT _____ OF _____



Beg B exam at count # 547 w/ 90° mirror

Count 548 start J-B to No2 25R area scan w/90° End # 564

RELOC
Start Count 333
90° side

Count 497 40B sparger nozzle
531 41B

548 B J-Bol reseat

BOSTON E[illegible]ON COMPANY
PILGRIM NUC[illegible] POWER STATION
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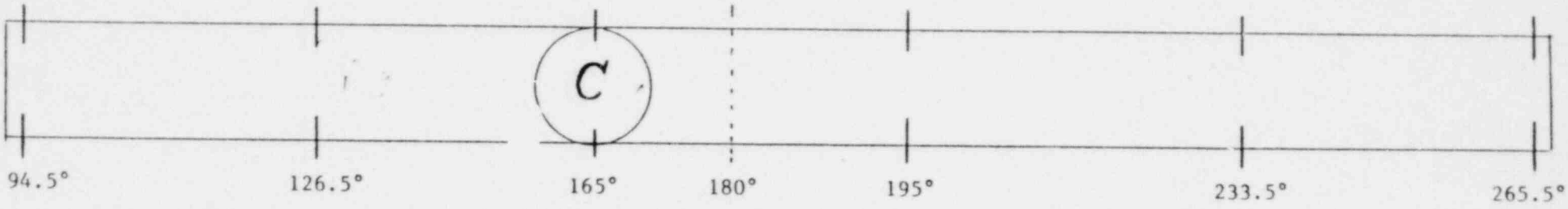
REPORT _____ OF _____



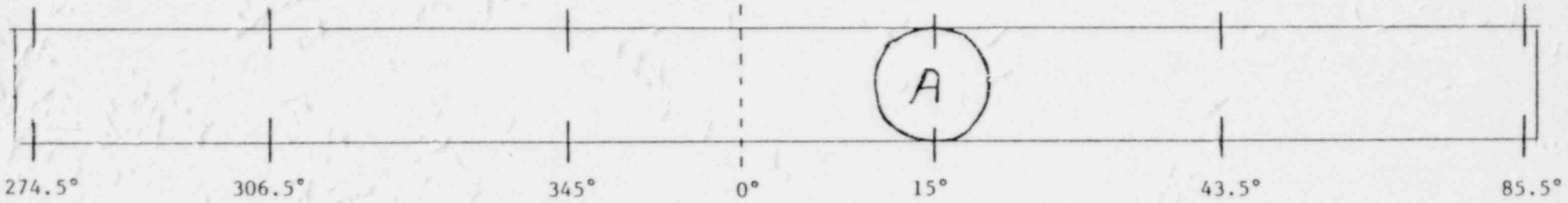
① Junction Box/Sparger from 180° side HAZ NOT 180°
" " 90° " HAZ 1980 EXAM END POINT 186
②

✓ ① [illegible]

1981 Relook

BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT _____ OF _____



① NOZZLE 14A CENTER OF PIPE SMALL TRANSVERSE INDICATION ON PIPE
② 16A " " END OF COUNT 586

RE LOOK TAPE w/
① C J Box from 180° side - lower quad OK heavy grind at the fillet weld caused shadows in 1980 linear ind from arc strike in 1980 not seen in 1981
count 135 90° side of "C" J-Box

RELOOK 1980
5+ COUNT 415 270° ind
456 J-Box 90° side

1981
cont 568 - 13A
16-17A

BOSTON E[illegible] COMPANY
PILGRIM NUCLEAR POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
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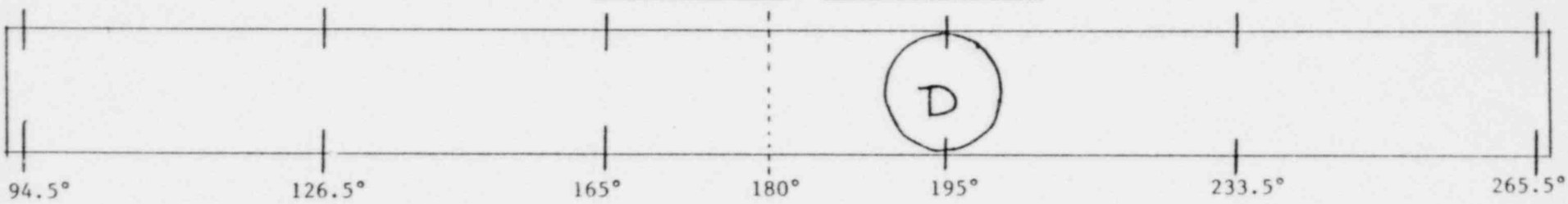
REPORT _____ OF _____



(1) 90° diameter Rec from 270° side to 90° quadrant ending count N° 216
Lower quadrant — start 216 end 330

Record
Start [illegible] 188) from 270° Lid
① count 375 on 90° side weld.

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