

INSERVICE INSPECTION REPORT

OF THE

SURRY UNIT NO. 1 NUCLEAR POWER STATION  
P. O. BOX 315  
SURRY, VIRGINIA 23883

FOR

VIRGINIA ELECTRIC AND POWER COMPANY  
P. O. BOX 26666  
RICHMOND, VIRGINIA - 23201

COMMERCIAL SERVICE DATE: DECEMBER 22, 1972  
OPERATING CAPACITY: 822 MWe  
REPORT DATE: AUGUST 1981  
REFUELING OUTAGE: V-VI

PERFORMED BY:

WESTINGHOUSE ELECTRIC CORPORATION  
NUCLEAR SERVICE DIVISION  
INSPECTION SERVICE  
P. O. BOX 2728  
PITTSBURGH, PENNSYLVANIA 15230

8110060251 811002  
PDR ADOCK 05000280  
Q PDR

FORM NIS-1 (back)

- 8. Examination Dates 9/20/80 to 7/15/81 9. Inspection Interval from 12/22/72 to 12/22/82
- 10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval. Reference Tab B and Tab C
- 11. Abstract of Conditions Noted Reference Tab B and Tab F
- 12. Abstract of Corrective Measures Recommended and Taken Reference Tab B and Tab F

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

Date September 18 19 81 Signed UEPCO By [Signature]  
 Owner Superintendent NDE

Certificate of Authorization No. (if applicable) N/A Expiration Date N/A

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Virginia and employed by <sup>The Hartford Steamers</sup> ~~BLR, TALS AND TALS Co.~~ of Hartford Conn have inspected the components described in this Owners' Data Report during the period 9/20/80 to 7/15/81, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owners' Data Report in accordance with the requirements of the ASME Code, Section XI.

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

Date 9/22 19 81  
Raymond D. Struck Commissions NB 8549 - VA - 280  
 Inspector's Signature National Board, State, Province and No.

**FORM NIS-1 OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS**

As required by the Provisions of the ASME Code Rules

1. Owner Virginia Electric And Power Company P.O. Box 26666, Richmond, VA, 23261  
(Name and Address of Owner)

2. Plant Surry #1, P.O. Box 315, Surry, Virginia 23883  
(Name and Address of Plant)

3. Plant Unit 1 4. Owner Certificate of Authorization (if required) N/A

5. Commercial Service Date 12/22/72 6. National Board Number for Unit N/A

7. Components Inspected

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
Reactor Vessel	Rotterdam	RCPCRV 137-1	- - -	- - -
R. V. Internals	Allis-Chalmers	RCRIUI RCRILI	- - -	- - -
Pressurizer	Westinghouse	RCPCPR	- - -	1031
St. Gen. 1	Westinghouse	2981	- - -	681
St. Gen. 2	Westinghouse	2982	- - -	682
St. Gen. 3	Westinghouse	2983	- - -	683
Reactor Coolant Piping	Southwest Fab. Co.	- - -	- - -	- - -
Class 1 Piping	Southwest Fab. Co.	- - -	- - -	- - -
Class 2 Piping	Southwest Fab. Co.	- - -	- - -	- - -
R.C. Pump 1	Westinghouse	458	- - -	- - -
R.C. Pump 2	Westinghouse	459	- - -	- - -
R.C. Pump 3	Westinghouse	460	- - -	- - -
Valve 1-595	Darling	- - -	- - -	- - -
Valve 1-700	Copes Vulcan	- - -	- - -	- - -
Valve 1-875D	Darling	- - -	- - -	- - -
RHR HX 1A	Atlas Industrial	890	- - -	740

Note: Supplemental sheets in form of lists, sketches, or drawings may be used provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

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(Name and Address of Plant)

3. Plant Unit 1 4. Owner Certificate of Authorization (if required) N/A

5. Commercial Service Date 12/22/72 6. National Board Number for Unit N/A

**7. Components Inspected**

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
RHR HX 1B	Atlas Industrial	891	- - -	741
Seal Water Heat Exch.	Joseph Oats & Sons	1817-2A	- - -	346
Regenerative HX	Sentry	4195-A3-7	- - -	369
		4195-A3-8		370
		4195-A3-9		371
Volume Control Tank	Richmond Eng.	L-8554	- - -	57783
Charging Pump 1A	Byron Jackson Pumps	- - -	- - -	- - -

Note: Supplemental sheets in form of lists, sketches, or drawings may be used provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

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VIRGINIA ELECTRIC AND POWER COMPANY  
SURRY NUCLEAR POWER PLANT UNIT NO. 1  
OUTAGE CORE V-VI  
INSERVICE AND PRESERVICE INSPECTION  
EXAMINATION SUMMARY  
1980 - 1981

INTRODUCTION

The following was performed by Westinghouse Nuclear Service Division and Virginia Electric and Power Company at the Surry Unit No. 1 Nuclear Power Plant from September 20, 1980 thru July 5, 1981.

1. Inservice examination was performed to Section XI of the ASME Boiler and Pressure Vessel Code 1974 Edition up to and including Summer 1975 Addenda and to the Plant Technical Specification on the following items.
  - A. Reactor Vessel Circumferential and Longitudinal Welds
  - B. Reactor Vessel Upper and Lower Internals
  - C. Reactor Vessel Core Barrel
  - D. Pressurizer
  - E. Class 1 and Class 2 Piping and Supports
  - F. Reactor Coolant Pumps
  - G. Class 1 and Class 2 Components
  - H. Class 1 and Class 2 Valves
  - I. Class 2 Pumps
  - J. Sensitized Stainless Steel Piping
  - K. High Energy Welds Change 13 Parts A and B
  - L. Hydrostatic Test of Class 1 Systems
  
2. Preservice examination was performed to Section XI of the ASME Boiler and Pressure Vessel Code 1974 Edition up to and including Summer 1975 Addenda and to the Plant Technical Specification on the following items.
  - A. Steam Generators 1, 2 and 3 Nozzle to Safe-End Welds
  - B. Class 1 Reactor Coolant Piping.

These examinations were performed in accordance with an approved Program Plan located under Tab C of the final report.

Examination procedures were approved prior to the examinations and certification documents relative to personnel, equipment and materials were reviewed and determined to be satisfactory.

Inspections, witnessing and surveillance of the examinations and related activities were conducted by personnel from: Hartford Steam Boiler Inspection and Insurance Company; Virginia Electric and Power company Non-Destructive Testing Personnel and Virginia Electric and Power Company Quality Assurance Departments.

## RESULTS

Examinations resulted in a total of twenty-three (23) recordable indication items being noted on the basis of procedure recording criteria, while are generally more critical than specified ASME Acceptance standards. Four (4) items were found to be acceptable which the remaining nineteen (19) were dispositioned by plant maintenance personnel.

A summary of the indication items are as follows:

- A. The reactor vessel lower and intermediate longitudinal welds 6, 7, 8 and 9 on VPA-1-1100 contained a total of twenty-two (22) separate recordable indications detected by the ultrasonic methods.
- B. One (1) indication was noted during penetrant examination as a recordable linear indication in the area of the base metal examination area of a sensitized piping patch.
- C. Eighteen (18) recordable indications were noted during visual examinations and consisted of the following.
  1. Eleven (11) recordable indications were on Bolting consisting of rust and/or boric acid.
  2. Two (2) recordable indications were gouges on the base metal adjacent support hangers.
  3. One (1) recordable indication consisted of a bent hanger rod.
  4. One (1) recordable indication consisted of a bent hanger rod with a loose bolt.
  5. One (1) recordable indication consisted of rust and loose bolt on a valve bonnet bolting.
  6. One (1) recordable indication consisted of weld spatter located on the adjacent scanning area of base metal of a weld.
  7. One (1) indication consisted of an arc strike in the area of base metal examination of a sensitized piping patch.
- D. Specific data relative to the above indications is located under Tab F of Volume 2 of this report.

## EXAMINATIONS

Examinations were conducted to review as much of the examination zone as was practical, within geometric, metallurgical and physical limitations. When the required examination volume or area could not be examined 100%, the examination was considered to be partial (PAR) and so noted. Generally, PAR's are noted

at fitting-to-fitting assemblies (as explained under LIMITATIONS) and in areas where integrally welded supports, lugs, hangers, etc., preclude access to some part of the examination area.

Ultrasonic examinations that produced greater than reference level sensitivity from reflectors that are characteristic of metallurgical structure of the I.D./O.D. surfaces of an item were acknowledged for information only and were noted as such on that data sheet. Examples of areas that generally produce such geometric indications include:

- (1) I.D. weld prep or root and/or the crown overlay or toe.
- (2) The I.D. radius of the tube sheet on the channel head to tube sheet weld of steam generators, when examining from the tubesheet side.
- (3) The metallurgical structure of cast materials.
- (4) Responses from the thread areas of bolting.

Geometric responses from these areas are characteristic of the examination and are not considered relevant for reporting length or depth.

#### LIMITATIONS

Some of the arrangements and details of the piping system and components were designed and fabricated before the access and examination requirements of Section XI of the 1971 Code could be applied; consequently some examinations are limited or not practical due to geometric configuration or accessibility. Generally, these limitations exist at all fitting-to-fitting joints such as elbow to tee, elbow to valve, reducer to valve, etc., where geometry and sometimes surface condition preclude ultrasonic coupling or access for the required scan length.

The limitations exist to a lesser degree at pipe fitting assemblies, particularly where the weld is not ground flush with the pipe O.D. surface. At these joints examinations can be conducted from the pipe side, however, the fitting again limits or precludes examination from the opposite side. When the weld surface is flat, the fitting side examination is replaced by a calibrated straight beam examination on the weld.

In most cases, examinations in these areas were accomplished as a best effort attempt to cover as much of the code required area or volume (generally, the weld and base metal for 1 "T" on each side) as is possible, however, the extent of examination coverage in the base metal of the fitting or component cannot be specifically qualified.

Areas where complete examination of 100% of the required volume or area could not be achieved are indicated by a PAR (partial) notation on the examiner's data sheet, and the limiting cause is noted.

The principal basis for PAR's is to identify the inability to examine 100% of the required base metal volume for the 1 "T" distance beyond the edge of the weld on a fitting or component, such as: ultrasonic examination of a pipe to elbow assembly, where scanning on the intrados of the elbow causes de-coupling of the sound beam; or a pipe to flange or valve assembly, where scanning the entire volume on the fitting or component side is limited by configuration.

The resulting coverage is such that examination of the weld, heat affected zone and base metal for 1 "T" on the pipe side can be achieved by scanning from the pipe side of the weld. An indeterminate coverage of the base metal on the fitting or component side may be achieved during this pipe side scan depending on the calibrated sweep length, attenuation, joint configuration, etc.; however, the volume on the fitting or component side additionally cannot be scanned completely for transverse indications as required by Code. In either case, 100% of this 1 "T" volume cannot be assured, thus a PAR is required as a disclaimer to having satisfied code requirements, albeit the intent is satisfied to the extent practical.

Specific limitations and restrictions for all examinations are as indicated on the raw data sheets - Section D of the Final Report.