

# **BOSTON EDISON COMPANY**

## **PILGRIM NUCLEAR GENERATING STATION**

INVESSEL VISUAL INSPECTION  
EIGHTH REFUEL OUTAGE



## **FINAL REPORT**

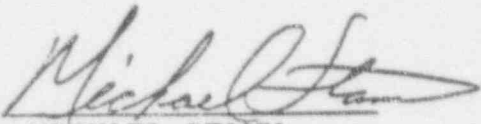
GE INSPECTION SERVICES

PILGRIM NUCLEAR POWER STATION  
BOSTON EDISON COMPANY  
IVI REACTOR INTERNAL COMPONENTS  
RFO 8 - AUGUST 1991

FINAL REPORT

GE NUCLEAR ENERGY  
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WAYNE, PENNSYLVANIA 19087  
(215) 975-6000

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LEVEL III

  
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PROJECT MANAGER  
INSPECTION SERVICES

INDEX

FINAL REPORT FOR  
INVESSEL INSPECTIONS  
OF REACTOR INTERNAL COMPONENTS  
PERFORMED AT  
PILGRIM NUCLEAR GENERATING STATION  
BOSTON EDISON ELECTRIC COMPANY

SECTION I	WORK SCOPE
SECTION II	SUMMARY
SECTION III	DATA SHEETS
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PILGRIM NUCLEAR POWER STATION  
INVESSEL VISUAL INSPECTIONS  
EIGHTH REFUELING AND INSPECTION OUTAGE  
SECTION I  
WORK SCOPE



PILGRIM NUCLEAR POWER STATION  
BOSTON EDISON COMPANY  
IVI REACTOR INTERNAL COMPONENTS  
RFO 8 - AUGUST 1991

WORK SCOPE

The invessel visual examination performed during RFO 8 included selected portions of the following components:

VESSEL CLADDING  
TOP GUIDE OF CORE  
GUIDE RODS AND BRACKETS  
JET PUMP ASSEMBLY AND BRACES  
SHROUD SHELF AND WELDS  
SURVEILLANCE SAMPLES AND BRACKETS  
CORE SPRAY SPARGERS  
CORE SPRAY PIPING  
FEEDWATER SPARGERS  
CLOSURE HEAD CLADDING AND STEAM DRYER BRACKETS  
STEAM DRYER SUPPORT BRACKETS  
SRM IRM DRY TUBES  
TOP GUIDE BOLTING  
FLANGE SEALING SURFACE  
CRD RETURN NOZZLE  
CORE PLATE  
STEAM DRYER  
MOISTURE SEPARATOR

The examination also included areas that were examined as surveillance of indications detected during previous outages.

PILGRIM NUCLEAR POWER STATION  
INVESSEL VISUAL INSPECTIONS  
EIGHTH REFUELING AND INSPECTION OUTAGE  
SECTION II  
SUMMARY

PILGRIM NUCLEAR POWER STATION  
BOSTON EDISON COMPANY  
IVI REACTOR INTERNAL COMPONENTS

RFO 8 - AUGUST 1991

EXAMINATION SUMMARY

During the period of May 28 through June 14, 1991, GE Nuclear Energy personnel performed In-vessel Visual Inspections on internal components of the Pilgrim Nuclear Power Station RPV. This section details the techniques used and the results of the inspection.

**EXAMINATION TECHNIQUES**

The examinations were performed using Remote CCTV Equipment, underwater lighting, hand held camera mounted lighting, and VHS videotape recording equipment. System resolution was verified using an 18% neutral gray card with both a 1/32" line and a 1 mil wire. Resolution was verified on each videotape recorded.

**EXAMINATION RESULTS AND RELEVANT INDICATIONS**

There was no evidence of degradation of the RPV Internal Components detected during this examination other than the indication noted on the steam dryer. There were two (2) cracks recorded on the dryer leveling screws. The first is located at 35° by the lifting lug and is approximately 2" long. The second is at 215° and is approximately 1 3/4" long, reference Tape PILG-91-15, tape counts 00 through 178. Both leveling screw tack welds were reported cracked in 1987, reference Tape #1. An underwater weld repair was also done in 1987. GE Nuclear located in San Jose, CA has recommended to run as is. Reference GE letter "Evaluation of Steam Dryer Leveling Screw Cracks", June 19, 1991. Reference GE NCR #E-68645-008. Previous data recorded an indication approximately 3" long on B Core Spray Sparger between the "T" box and the B 25 nozzle. No indications were recorded this outage. This area was then wire brushed and videotaped, reference Tape PILG-91-14, tape counts 00 through 1415. No indications were detected. An extensive review of the previous data shows the following:

No indications were recorded on videotape #1 by Southwest Research in 1987.

The 1980, 1981 and 1984 videotapes show linear indications of different lengths, sizes and orientation which could possibly indicate scale or some other phenomena. Camera resolution and film quality was excellent in 1987 and 1991. Previous film quality was not as good, and in some cases poor.

The following set screws on the shroud side of the jet pumps had a gap.

Jet Pump #2  
Jet Pump #20

#### LOOSE PARTS

This examination revealed the following loose parts. A "J" hook was located on the shroud ledge between Jet Pump #8 and #9. This hook was later removed along with a 3/8" s.s. nut.

A small screw on the top guide periphery at 45°.

A small screw on the top guide hold down bolt ring at 45°.

A small washer on the core plate as well as string.

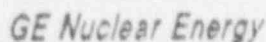
#### NON-RELEVANT INDICATIONS

There were many areas that contained indications that were proven to be non-relevant. Both the 0° and 180° guide rods have scratches. There were also scratches noted on the sensing line Jet Pump #16 and the shroud head bolts. Rub and stain marks were also recorded on the steam dryer lifting lugs.

Hydrolazing was performed prior to the IVVI Inspection which resulted in excessive debris covering much of the vessel internals. The debris was so thick on the shroud ledge that the man-way covers could not be detected. The man-way covers were brushed off and re-inspected.

PILGRIM NUCLEAR POWER STATION  
INVESSEL VISUAL INSPECTIONS  
EIGHTH REFUELING AND INSPECTION OUTAGE  
SECTION III  
DATA SHEETS





## INVESSEL VISUAL EXAMINATION DATA SHEET

UNIT: 1REVISION No. 0

REPORT NO.

FRR No. N/A

PLG-91

Equipment used During the Examination:

- ☐ Color Underwater camera
- ☐ B/W Underwater camera
- ☐ Regular VHS Recorder
- ☐ Super VHS Recorder
- ☐ Underwater Lights

- ☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: FLAS  
☐ Other: LIGHT

## CAMERA RESOLUTION

- ☐ Verified 0.001" Diameter wire
- ☒ Verified V32" Black line on an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☒ VT-1      ☐ VT-3  
☒ DIRECT      ☐ REMOTE

<i>M. A. [Signature]</i>	<i>III</i>	<i>6.01.91</i>
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE

COMMENTS:

REF. GE R1C31L 50 ATT. 42  
VISUAL INSPECTION OF RPV  
CLADDING

M. K. [Signature] III 06-01-91		
REVIEWED	LEVEL	DATE
[Signature]	2nd	6/2/91
REVIEWED	TITLE	DATE

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GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
 REVISION No. 0  
 PROJECT NUMBER: 91-V-0468 FRR No. N/A

## Equipment used During the Examination:

☒ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights  
☐ Service Platform  
☒ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

☒ Verified 0.007" Diameter wire  
☒ Verified V32" Black line on an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☒ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts IN. MIN.	Examination Results
1 MIL WIRE & TITLE	PILG-91-1	00 - 1.30	1 MIL WIRE RESOLVED
45° STEAM DRYER SUPPORT BRACKET	PILG-91-1	1.3 - 7.19	NO APPARENT ABNORMAL CONDITIONS
135° STEAM DRYER SUPPORT BRACKET	PILG-91-1	7.19 - 8.48	NO APPARENT ABNORMAL CONDITIONS
225° STEAM DRYER SUPPORT BRACKET	PILG-91-1	8.48 - 11.03	NO APPARENT ABNORMAL CONDITIONS
315° STEAM DRYER SUPPORT BRACKET	PILG-91-1	11.03 - 12.17	NO APPARENT ABNORMAL CONDITIONS
0° GUIDE ROD AND BRACKET	PILG-91-1	12.17 - 19.22	NO APPARENT ABNORMAL CONDITIONS
180° GUIDE ROD AND BRACKET	PILG-91-1	19.22 - 25.15	NO APPARENT ABNORMAL CONDITIONS
FLANGE SEALING SURFACE	PILG-91-1	25.15 - 44.13	NO APPARENT ABNORMAL CONDITIONS
45° FEEDWATER SAMPLER AND BRACKETS	PILG-91-1	44.13 - 59.48	NO APPARENT ABNORMAL CONDITIONS
135° FEEDWATER SAMPLER AND BRACKETS	PILG-91-1	59.48 - 114.14	NO APPARENT ABNORMAL CONDITIONS
225° FEEDWATER SAMPLER AND BRACKETS	PILG-91-1	114.14 - 127.00	NO APPARENT ABNORMAL CONDITIONS
315° FEEDWATER SAMPLER AND BRACKETS	PILG-91-1	127.00 - 140.25	NO APPARENT ABNORMAL CONDITIONS
CORE SPRAY PINE 0° THRU 180°	PILG-91-1	140.25 - 219.49	
1 MIL WIRE	PILG-91-1	219.49 - 220.21	1 MIL WIRE RESOLVED

M. A. J. III 5-28-91  
 EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

## COMMENTS:

SCRATCHES WERE NOTED ON THE  
 0° AND 180° GUIDE RODS.

M. A. J. III 5-28-91  
 REVIEWED LEVEL DATE

M. J. III 6/12/91  
 REVIEWED TITLE DATE

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GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FRR No. N/A

## Equipment used During the Examination:

- ☐ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights

- ☐ Service Platform  
☒ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.00T Diameter wire  
☒ Verified V32" Black line on an 18% Neutral Gray card

## TYPE OF VISUAL EXAMINATION

- ☒ VT-1 ☒ VT-2  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
1 MIL WIRE AND TITLE	PILG-91-02	00-119	1 MIL WIRE RESOLVED
CORE SPRAY PIPING			NO APPARENT
180° THROUGH 0°	PILG-91-02	119-1884	ABNORMAL CONDITIONS
CORE SPRAY SPARGER			NO APPARENT
NOZZLES 0° THROUGH 180°	PILG-91-02	1884-2378	ABNORMAL CONDITIONS
UPPER CORE SPRAY SPARGER			
0° THROUGH 180°, NOZZLES			NO APPARENT
BRACKETS AND "T" BOX	PILG-91-02	2378-3820	ABNORMAL CONDITIONS
UPPER CORE SPRAY SPARGER			
180° THROUGH 360°, NOZZLES	PILG-91-02	3820-4458	NO APPARENT
BRACKETS AND "T" BOX			ABNORMAL CONDITIONS
LOWER CORE SPRAY SPARGER			NO APPARENT
0° THROUGH 180°	PILG-91-02	4458-4932	ABNORMAL CONDITIONS
LOWER CORE SPRAY SPARGER			NO APPARENT
180° THROUGH 360°	PILG-91-02	4932-5852	ABNORMAL CONDITIONS
LOWER CORE SPRAY SPARGER			NO APPARENT
0° THROUGH 180°	PILG-91-02	5852-5906	ABNORMAL CONDITIONS

M. A. Smith III 5-28-91  
EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

## COMMENTS:

NONE

REF. IS BULLETIN 80-13 AND GE  
SIL 289

M. A. Smith III 6-1-91  
REVIEWED LEVEL DATE

M. A. Smith III PM 6/1/91  
REVIEWED TITLE DATE

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GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
 REVISION No. 0  
 PROJECT NUMBER: 91-V-2468 FRN No. N/A

## Equipment used During the Examination:

- ☒ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Light
- ☐ Service Platform  
☒ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.007" Diameter Wire  
☒ Verified V32" Black  
 at 18% Neutral Gra. 0

## TYPE OF VISUAL EXAMINATION

- ☒ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts IN MIN.	Examination Results
LOWER CORE SPRAY SPARGER 0° THROUGH 180°	PILG-91-03	00 - 15.00	NO APPARENT ABNORMAL CONDITIONS
LOWER CORE SPRAY SPARGER 180° THROUGH 360°	PILG-91-03	15.00 - 32.28	NO APPARENT ABNORMAL CONDITIONS
UPPER CORE SPRAY SPARGER 0° THROUGH 180°	PILG-91-03	32.28 - 51.25	NO APPARENT ABNORMAL CONDITIONS
UPPER CORE SPRAY SPARGER 180° THROUGH 360°	PILG-91-03	51.25 - 107.26	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-03	107.26 - 108.12	1 MIL WIRE RESOLVED
TOP GUIDE HOLD DOWN BOLTS (360°)	PILG-91-03	108.12 - 130.51	LOSS SCREW ON GUIDE NO OTHER APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-03	130.51 - 131.33	1 MIL WIRE RESOLVED
JET PUMP #20	PILG-91-03	131.33 - 145.37	NO CONTACT WITH THE SHROUD SIDE SET SCREW
JET PUMP #19	PILG-91-03	145.37 - 157.19	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #18	PILG-91-03	157.19 - 203.07	NO APPARENT ABNORMAL CONDITIONS
			CONT. ON TAPE # 04
REF. GE SIL 289 AND IE BULLETIN 80-13			

EXAMINER <u>II</u> LEVEL <u>II</u> DATE <u>5-21-91</u>			COMMENTS: - SCREW WAS NOTED ON TOP GUIDE - NO CONTACT WITH THE SHROUD SIDE SET SCREW ON JET PUMP #20 - REF GE SIL 420 FOR THE JET PUMP SENSING LINES - REF GE RISIL 45 FOR THE JET PUMP RISER BRACES.
EXAMINER	LEVEL	DATE	
EXAMINER	LEVEL	DATE	
EXAMINER	LEVEL	DATE	
EXAMINER	LEVEL	DATE	
REVIEWED <u>M. H. [Signature]</u> LEVEL <u>III</u> DATE <u>06-01-91</u>			PAGE <u>7</u> OF <u>61</u> FORM EG 4-2-90
REVIEWED <u>M. H. [Signature]</u> TITLE <u>PM</u> DATE <u>6/1/91</u>			



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-104 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FRN No. N/A

## Equipment used During the Examination:

☐ Color Underwater camera  
☐ B/W Underwater camera  
☐ Regular VHS Recorder  
☐ Super VHS Recorder  
☐ Underwater Lights

☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

☒ Verified 0.001" Diameter wire  
☒ Verified V32" Block line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☒ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts in min	Examination Results
JET PUMP # 18	PILG-91.04	00-16.30	NO APPARENT ABNORMAL CONDITIONS
JET PUMP # 17	PILG-91.04	16.30-26.59	NO APPARENT ABNORMAL CONDITIONS
JET PUMP # 16	PILG-91.04	26.59-52.17	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE AND TITLE	PILG-91.04	52.17-53.05	1 MIL WIRE RESOLVED
JET PUMP # 15	PILG-91.04	53.05-112.52	NO APPARENT ABNORMAL CONDITIONS
JET PUMP # 14	PILG-91.04	112.52-128.50	NO APPARENT ABNORMAL CONDITIONS
JET PUMP # 13	PILG-91.04	128.50-144.29	NO APPARENT ABNORMAL CONDITIONS
JET PUMP # 12	PILG-91.04	144.29-158.30	NO APPARENT ABNORMAL CONDITIONS
JET PUMP # 11	PILG-91.04	158.30-203.04	NO APPARENT ABNORMAL CONDITIONS

M. J. [Signature] 05.29.91  
EXAMINER LEVEL DATE  
M. J. [Signature] \_\_\_\_\_  
EXAMINER LEVEL DATE  
M. J. [Signature] \_\_\_\_\_  
EXAMINER LEVEL DATE  
M. J. [Signature] \_\_\_\_\_  
EXAMINER LEVEL DATE  
M. J. [Signature] \_\_\_\_\_  
EXAMINER LEVEL DATE

COMMENTS: \* SCRATCHES WERE NOTED ON THE  
SENSING LINE JET PUMP # 16

- REF. GE SIL 420 FOR THE JET PUMP  
SENSING LINES.  
- REF. GE AICSIL 45 FOR THE JET PUMP  
RISER BRACES.

M. J. [Signature] 06.03.91  
REVIEWED LEVEL DATE  
M. J. [Signature] 6/17/91  
REVIEWED TITLE DATE

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GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
 PROJECT NUMBER: 91-V-0468 REVISION No. 0 FAR No. N/A

## Equipment used During the Examination:

- ☐ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights
- ☐ Service Platform  
☒ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on  
 an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☒ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts 1st MIN.	Examination Results
JET PUMP #1	PILG-91-05	00-7.10	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE AND TITLE	PILG-91-05	7.10-7.51	MIL WIRE RESOLVED
* JET PUMP #10	PILG-91-05	7.51-19.45	NO APPARENT ABNORMAL CONDITIONS
180° MANWAY COVER	PILG-91-05	19.45-22.12	COVERED WITH SEDIMENT
0° MANWAY COVER	PILG-91-05	22.12-25.29	COVERED WITH SEDIMENT
JET PUMP #01	PILG-91-05	25.29-40.39	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #02	PILG-91-05	40.39-54.03	GAP IN SET SCREEN * SHROUD SIDE
JET PUMP #03	PILG-91-05	54.03-105.01	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #04	PILG-91-05	105.01-116.23	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #05	PILG-91-05	116.23-125.49	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #06	PILG-91-05	125.49-133.19	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #07	PILG-91-05	133.19-143.16	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #08	PILG-91-05	143.16-155.26	NO APPARENT ABNORMAL CONDITIONS

M. A. Zwick III 5-29-91  
 EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

COMMENTS: THERE IS A GAP IN THE SHROUD  
 \* SIDE SET SCREEN JET PUMP #02

- REF. GE SILE 9120 FOR THE JET PUMP  
 SENSING LINGS  
 - REF. GE A1031L 45 FOR THE JET PUMP  
 RISES BRACKETS

M. A. Zwick III 06-01-91  
 REVIEWED LEVEL DATE

M. A. Zwick III PM 6/1/91  
 REVIEWED TITLE DATE

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GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGAM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FAR No. N/A

## Equipment used During the Examination:

☐ Color Underwater camera  
☒ B/W Underwater camera  
☐ Regular VHS Recorder  
☐ Super VHS Recorder  
☒ Underwater light  
☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

☒ Verified 0.001" Diameter wire  
☒ Verified 1/32" Black line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☒ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts IN. MIN.	Examination Results
JET PUMP #09	PILG-91-05	155.26 - 206.11	NO APPARENT ABNORMAL CONDITIONS
JET PUMP #10	PILG-91-05	206.11 - 206.50	NO APPARENT ABNORMAL CONDITIONS CON. ON TAPE # 06
1 MIL WIRE	PILG-91-05	206.50 - 207.25	1 MIL WIRE RESOLVED

M. H. Smith III 5-29-91  
EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

COMMENTS: REF. GE SIC 420 FOR THE JET  
PUMP SENSING LINES

REF. GE RICSIL 45 FOR THE JET PUMP  
RISER BRACKETS

"J" HOOK ON SHROUD LEDGE BETWEEN  
JET PUMP # 10 & # 09

M. H. Smith III 6-1-91  
REVIEWED LEVEL DATE

M. H. Smith III 6/1/91  
REVIEWED TITLE DATE

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GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
 REVISION No. 0  
 PROJECT NUMBER: 91-V-0468 FRR No. N/A

## Equipment used During the Examination:

- ☒ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights  
☐ Service Platform  
☒ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified 1/32" Black line on  
 on 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☒ VT-1 ☒ VT-2  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
BOTTOM SIDE OF THE TOP GUIDE	PILG-91-06	00-508	* NO APPARENT ABNORMAL CONDITIONS
CORE PLATE	PILG-91-06	508-1049	NO APPARENT ABNORMAL CONDITIONS
JET PUMP 10	PILG-91-06	1049-1390	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-06	1390-1450	1 MIL WIRE RESOLVED
280° SURVEILLANCE SAMPLE AND BRACKET	PILG-91-06	1450-1658	NO APPARENT ABNORMAL CONDITIONS
185° SURVEILLANCE SAMPLE AND BRACKET	PILG-91-06	1658-1816	NO APPARENT ABNORMAL CONDITIONS
95° SURVEILLANCE SAMPLE AND BRACKET	PILG-91-06	1816-1847	SAMPLE IS REMOVED
1 MIL WIRE	PILG-91-06	1847-1920	1 MIL WIRE RESOLVED
TOP GUIDE CENTER CELLS	PILG-91-06	1920-3236	NO APPARENT ABNORMAL CONDITIONS
TOP GUIDE PERIPHERAL 0° THROUGH 180°	PILG-91-06	3236-4418	SMALL SCREEN ON THE TOP GUIDE @ 45°
TOP GUIDE PERIPHERAL 180° THROUGH 360°	PILG-91-06	4418-5077	NO APPARENT ABNORMAL CONDITIONS
CRO NOZZLE	PILG-91-06	5077-5166	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-06	5166-5180	1 MIL WIRE RESOLVED

M. J. [Signature] III 5-30-91  
 EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

COMMENTS: SMALL SCREEN ON THE TOP GUIDE PERIPHERAL @ 45°  
 \* REF GE RLSIL 059 TOP GUIDE

- REF. GE SIL 420 FOR THE JET PUMP SENSING LINGS

- REF. GE RLSIL 48 FOR THE JET PUMP RISER BRACKETS

M. J. [Signature] III 6-15-91  
 REVIEWED LEVEL DATE

M. J. [Signature] III 6-15-91  
 REVIEWED TITLE DATE

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FORM 89-4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-20Y REPORT NO. PILG-91  
 REVISION No. 0  
 PROJECT NUMBER: 91-V-0468 PRR No. N/A

## Equipment used During the Examination:

☐ Color Underwater camera  
☐ B/W Underwater camera  
☐ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights

☐ Service Platform  
☒ Refueling Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

☒ Verified 0.007" Diameter wire  
☒ Verified V32" Black line on  
 an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts (A. MIN.)	Examination Results
1 MIL WIRE AND TITLE	PILG-91-07	00-1.02	1 MIL WIRE RESOLVED
IRM 36-09 NW SIDE ONLY	PILG-91-07	1.02-2.34	NO APPARENT ABNORMAL CONDITIONS
IRM 36-41 NW & SE SIDE ONLY	PILG-91-07	2.34-6.47	NO APPARENT ABNORMAL CONDITIONS
SRM 36-33	PILG-91-07	6.47-15.41	NO APPARENT ABNORMAL CONDITIONS
IRM 28-33	PILG-91-07	15.41-33.20	* NO APPARENT ABNORMAL CONDITIONS
IRM 28-25 SE SIDE ONLY	PILG-91-07	33.20-35.41	NO APPARENT ABNORMAL CONDITIONS
SRM 28-17 SE, SW, NW SIDE ONLY	PILG-91-07	35.41-43.18	NO APPARENT ABNORMAL CONDITIONS
IRM 20-25 SE & NW SIDE ONLY	PILG-91-07	43.18-48.13	NO APPARENT ABNORMAL CONDITIONS
IRM 20-33 SE & NE SIDE ONLY	PILG-91-07	48.13-52.34	NO APPARENT ABNORMAL CONDITIONS
SRM 20-41 SE & NW SIDE ONLY	PILG-91-07	52.34-56.14	NO APPARENT ABNORMAL CONDITIONS
IRM 12-41 NW & SE SIDE ONLY	PILG-91-07	56.14-101.11	NO APPARENT ABNORMAL CONDITIONS
SRM 12-25 SE & SW SIDE ONLY	PILG-91-07	101.11-106.25	NO APPARENT ABNORMAL CONDITIONS
IRM 12-09 NW SIDE ONLY	PILG-91-07	106.25-108.28	NO APPARENT ABNORMAL CONDITIONS

M. J. [Signature] 5-30-91  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE

## COMMENTS:

\* RUB MARKS ARE ON IRM 28-33  
 \* SRM 12-25 IS LABELED ON THE  
 TAPE AS IRM 12-25

M. J. [Signature] 6-6-91  
 REVIEWED LEVEL DATE  
M. J. [Signature] 6/17/91  
 REVIEWED TITLE DATE

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FORM EG 4-2-90





*GE Nuclear Energy*

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM

UNIT: 2

PROCEDURE No. GE-VT-204

REPORT NO.

PROJECT NUMBER: 91-V-0468

REVISION No. 0

P/G-91

Equipment used During the Examination:

☐ Color underwater camera

☒ B/W Urig - water camera

5 Regular VHS Recorder

☐ Super VHS Recorder

 Underwater Lights

1. *Journal of Management Studies*, 1997, 34, 1, 1-14.

☐ Service Platform

Refueling Bridge

First Box

☐ Other: \_\_\_\_\_☐ Other: \_\_\_\_\_

Source: <http://www.fishbase.org>

## CAMERA RESOLUTION

 Verified 0.0.1 Diameter wire

 Verified V32<sup>®</sup> Black line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

VT-1

VT-3

☐ DIRECT☐ REMOTE[illegible]

COMMENTS:

<i>M. K. [Signature]</i>	<i>III</i>	<i>5-30-91</i>
EXAMINER	LEVEL	DATE

EXAMINER	LEVEL	DATE
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EXAMINER	LEVEL	DATE
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EXAMINER \_\_\_\_\_ LEVEL \_\_\_\_\_ DATE \_\_\_\_\_

EXAMINER	LEVEL	DATE
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EXAMINER	LEVEL	DATE
----------	-------	------

RELOOK OF MANWAY COVERS

AFTER SEDIMENT WAS REMOVED

M. G. F. III 6.6.91

REVIEWED	LEVEL	DATE

REVIEWED	TITLE	DATE
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FORM 79-A-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FRR No. N/A

## Equipment used During the Examination:

- ☒ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights  
☐ Service Platform  
☐ Retracting Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.007 Diameter wire  
☒ Verified V32" Black line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
1 MIL WIRE AND TITLE	PILG-91-08	00-79	1 MIL WIRE RESOLVED
NONE	PILG-91-08	79-928	NO VIDEO PICTURE
STEAM ORIF			NO APPARENT
45° LIFTING LUG	PILG-91-08	928-1370	ABNORMAL CONDITIONS
315° LIFTING LUG	PILG-91-08	1350-1960	NO APPARENT
225° LIFTING LUG	PILG-91-08	1960-2264	ABNORMAL CONDITIONS
135° LIFTING LUG	PILG-91-08	2264-2500	NO APPARENT
WSW SEAL TO BANK			NO APPARENT
WELD REF. PAR. 6.27.9	PILG-91-08	2500-2660	ABNORMAL CONDITIONS
UNW SEAL TO BANK			NO APPARENT
WELD REF. PAR. 6.27.9	PILG-91-08	2660-2793	ABNORMAL CONDITIONS
UNW-WSW BANK HORIZ			NO APPARENT
WELDS REF. PAR. 6.27.6	PILG-91-08	2793-3050	ABNORMAL CONDITIONS
WSW-UNW SUPPORT RING			NO APPARENT
TO SEAL WELD 6.27.10	PILG-91-08	3050-3563	ABNORMAL CONDITIONS
WSW-UNW START TO START			NO APPARENT
HORIZ. WELD 6.27.15	PILG-91-08	3563-3794	ABNORMAL CONDITIONS
NW VERTICAL BANK			NO APPARENT
WELD 6.27.3	PILG-91-08	3794-4295	ABNORMAL CONDITIONS
NW SHILL HORIZONTAL			NO APPARENT
WELD 6.27.4	PILG-91-08	4295-4410	ABNORMAL CONDITIONS

COMMENTS: END 6-8-91

M. J. Smith III 6-8-91  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE

M. J. Smith III 6-8-91  
REVIEWED LEVEL DATE  
M. J. Smith PM 6/12/91  
REVIEWED TITLE DATE

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FORM 59 4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
 PROJECT NUMBER: 91-V-0468 REVISION No. 0 FAR No. N/A

## Equipment used During the Examination:

- ☒ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights  
☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other:

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
NW SEAL TO BARK WELD REF. PAR. 6.27.9	PILG-91-08	4410" 4565"	NO APPARENT ABNORMAL CONDITIONS
NW UPPER SUPPORT SEAL TO RING WELD 6.27.10	PILG-91-08	4565- 4709	NO APPARENT ABNORMAL CONDITIONS
NW SKIRT TO SKIRT HORIZ. WELD REF. PAR 6.27.13	PILG-91-08	4709- 4809	NO APPARENT ABNORMAL CONDITIONS
NW SKIRT TO SKIRT WELD REF. 6.27.15	PILG-91-08	4809- 5018	NO APPARENT ABNORMAL CONDITIONS
NW BELOW LIFTING LUG	PILG-91-08	5018- 5237	NO APPARENT ABNORMAL CONDITIONS
SW VERTICAL WELDS REF. 6.27.3	PILG-91-08	5237- 5928	NO APPARENT ABNORMAL CONDITIONS
SW SEAL TO BARK WELD 6.27.9	PILG-91-08	5928- 5972	NO APPARENT ABNORMAL CONDITIONS
SW HORIZ WELD REF. 6.27.4 AND 6.27.6	PILG-91-08	5972- 6140	NO APPARENT ABNORMAL CONDITIONS
SW UPPER HORIZ. RING TO SKIRT WELD 6.27.10	PILG-91-08	6140- 6233	NO APPARENT ABNORMAL CONDITIONS
SW UPPER HORIZ. SUPPORT TO SKIRT WELD 6.27.13	PILG-91-08	6233- 6485	NO APPARENT ABNORMAL CONDITIONS
SW-SSW HORIZ. SKIRT TO SKIRT WELD 6.27.15	PILG-91-08	6485- 6718	NO APPARENT ABNORMAL CONDITIONS

## COMMENTS:

NONE

M. J. Smith II 6-4-91  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE

M. J. Smith III 6-4-91  
 REVIEWED LEVEL DATE  
W. J. Smith PM 6/4/91  
 REVIEWED TITLE DATE

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FORM 89 4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
 PROJECT NO. 91-V-0468 REVISION No. 0 FRR No. N/A

Equipment used During the Examination: ☐ Color Underwater camera ☐ Service Platform  
☒ B/W Underwater camera ☐ Refueling Bridge  
☒ Regular VHS Recorder ☐ Float Box  
☒ Super VHS Recorder ☒ Other: PLATFORM  
☒ Underwater Lights ☐ Other: \_\_\_\_\_

CAMERA RESOLUTION  
☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on an 18% Neutral Gray Card

TYPE OF VISUAL EXAMINATION  
☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Taps Number	Tape Counts	Examination Results
STEAM DRYER			
1 MIL WIRE AND TITLE	PILG-91-09	00-65	1 MIL WIRE RESOLVED
NW VERTICAL BANK WELD	PILG-91-09	65-211	NO APPARENT ABNORMAL CONDITIONS
0° VERTICAL WELD	PILG-91-09	211-410	NO APPARENT ABNORMAL CONDITIONS
NE VERTICAL BANK WELDS 1 THROUGH 4	PILG-91-09	410-1016	NO APPARENT ABNORMAL CONDITIONS
NE TO NW SUPPORT RING AND VERTICAL WELDS	PILG-91-09	1016-2668	1150-1170 AND * 2270-2320
NW TO NE SKIRT TO SKIRT WELD	PILG-91-09	2668-2980	NO APPARENT ABNORMAL CONDITIONS
NE VERT CHANNEL WELD BELOW LIFTING LUG	PILG-91-09	2980-3320	NO APPARENT ABNORMAL CONDITIONS
0° GUIDE RING CHANNEL WELD	PILG-91-09	3320-3560	NO APPARENT ABNORMAL CONDITIONS
SOUTH BANK RS TO SEAL HORIZONTAL WELD	PILG-91-09	3560-3980	NO APPARENT ABNORMAL CONDITIONS
SW TO SE SEAL TO SUPPORT RING WELD	PILG-91-09	3980-4180	NO APPARENT ABNORMAL CONDITIONS
SW TO SE SUPPORT RING TO SKIRT WELD	PILG-91-09	4180-4433	NO APPARENT ABNORMAL CONDITIONS
SW TO SE SKIRT TO SKIRT HORIZONTAL WELD	PILG-91-09	4433-4658	NO APPARENT ABNORMAL CONDITIONS
180° VERTICAL BANK WELD	PILG-91-09	4658-4907	NO APPARENT ABNORMAL CONDITIONS

J. M. Moore II 6-4-91  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE

COMMENTS: \* THERE IS A CRACK @ 2" LONG ON THE SUPPORT LUG ADJACENT TO THE UPPER SUPPORT RING LOCATED IN THE NW TO NWY QUAD. (STEAM DRYER)  
 - REF. GE SIL Y24 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

M. L. Holt III 6-10-91  
 REVIEWED LEVEL DATE  
M. L. Holt III 6/10/91  
 REVIEWED TITLE DATE

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FORM 59 4-2-90





GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: L PROCEDURE No. GE-VT-204 REPORT NO. PILG. 91  
 REVISION No. 0  
 PROJECT NUMBER: 91-V-0468 FAR No. N/A

## Equipment used During the Examination:

- ☐ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights

- ☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on  
 an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1 ☒ VT-2  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
SE VERTICAL BANK WELDS # 4 AND 5	PILG. 91.09	4907-5025	NO APPARENT ABNORMAL CONDITIONS
GUIDE RAKE CHANNEL AND VERTICAL BANK WELD # 2	PILG. 91.09	5025-5298	NO APPARENT ABNORMAL CONDITIONS
BELOW LUG SW CORNER	PILG. 91.09	5298-5454	NO APPARENT ABNORMAL CONDITIONS
BEHIND LUG SE CORNER	PILG. 91.09	5454-5491	NO APPARENT ABNORMAL CONDITIONS
BELOW LUG SE CORNER	PILG. 91.09	5491-5615	NO APPARENT ABNORMAL CONDITIONS
HORIZONTAL BANK WELD # 5	PILG. 91.09	5615-5796	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG. 91.09	5796-5810	1 MIL WIRE RESOLVED

## COMMENTS:

REF. GE SIL 474 (ATT 40) STEAM  
 DRYER CHANNEL AND SUPPORT  
 RING.

M. G. [Signature] 6-4-91  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE  
 EXAMINER LEVEL DATE

M. G. [Signature] 6-10-91  
 REVIEWED LEVEL DATE  
M. G. [Signature] 6-10-91  
 REVIEWED TITLE DATE

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FORM 89 4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FRA No. N/A

## Equipment used During the Examination:

- ☐ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights  
☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on an 10% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
MOISTURE SEPARATOR 1 MIL WIRE AND TITLE	PILG-91-10	00 - 126	1 MIL WIRE RESOLVED
SHROUD HEAD BOLTS 48 THROUGH 43	PILG-91-10	126 - 1412	* NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-10	1412 - 1458	1 MIL WIRE RESOLVED
STAND TUBES STARTING AT 0° 1 THROUGH 17	PILG-91-10	1458 - 3495	NO APPARENT ABNORMAL CONDITIONS
STAND TUBES 19 THROUGH 24	PILG-91-10	3495 - 4680	NO APPARENT ABNORMAL CONDITIONS
STEAM DRYER 1 MIL WIRE	PILG-91-10	4680 - 4700	1 MIL WIRE RESOLVED
NE VERTICAL WELD #5 SE VERTICAL WELD #1	PILG-91-10	4700 - 4856	NO APPARENT ABNORMAL CONDITIONS
EAST SEAL TO BANK WELD	PILG-91-10	4856 - 4960	NO APPARENT ABNORMAL CONDITIONS
SE-NE SEAL TO SUPPORT RING WELD	PILG-91-10	4960 - 5123	NO APPARENT ABNORMAL CONDITIONS
SE-NE UPPER SUPPORT RING TO SMT WELD	PILG-91-10	5123 - 5312	NO APPARENT ABNORMAL CONDITIONS
LOWER SEAL TO BANK WELD	PILG-91-10	5312 - 5430	NO APPARENT ABNORMAL CONDITIONS
SMT TO SMT HORIZ. WELD	PILG-91-10	5430 - 5736	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-10	5736 - 5745	NO APPARENT ABNORMAL CONDITIONS

J. J. [Signature] II 6.5.91  
EXAMINER LEVEL DATE  
  
[Signature] LEVEL DATE  
EXAMINER LEVEL DATE  
  
[Signature] LEVEL DATE  
EXAMINER LEVEL DATE  
  
[Signature] LEVEL DATE  
EXAMINER LEVEL DATE

COMMENTS: \* THERE ARE RUB MARKS AND  
SCRATCHES ON THE SHROUD HEAD BOLTS  
  
- REF GE SIL 474 (ATT 10) STEAM DRYER  
CHANNEL AND SUPPORT RING

M. J. [Signature] III 6.10.91  
REVIEWED LEVEL DATE  
[Signature] PM 6/10/91  
REVIEWED TITLE DATE

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FORM 59 4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FRA No. N/A

## Equipment used During the Examination:

☐ Color Underwater camera  
☐ B/W Underwater camera  
☐ Regular VHS Recorder  
☐ Super VHS Recorder  
☒ Underwater Lights  
☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

☒ Verified 0.00T Diameter wire  
☒ Verified V32" Black line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
MOISTURE SEPARATOR			
1 MIL WIRE AND TITLE	PILG-91-11	00-30	1 MIL WIRE RESOLVED
SHROUD HEAD BOLTS			
01 THROUGH 24	PILG-91-11	30-4606	* NO APPARENT ABNORMAL CONDITIONS
LIFTING LUG BETWEEN			
BOLT 24 AND 25	PILG-91-11	4606-4829	** NO APPARENT ABNORMAL CONDITIONS
SHROUD HEAD BOLTS			
25 THROUGH 28	PILG-91-11	4829-5518	* NO APPARENT ABNORMAL CONDITIONS
15° LIFTING LUG	PILG-91-11	5518-5699	NO APPARENT ABNORMAL CONDITIONS
10° LIFTING LUG	PILG-91-11	5699-5946	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-11	5946-5956	1 MIL WIRE RESOLVED

SG Montrose II 6-5-91  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE  
EXAMINER LEVEL DATE

## COMMENTS:

\*\* STAINS AND RUB/WEAR MARKS  
\* SCRATCHES

SG Montrose II 6-11-91  
REVIEWED LEVEL DATE  
PM 6/11/91  
REVIEWED TITLE DATE

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FORM 59 4-2-90





GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
REVISION No. 0  
PROJECT NUMBER: 91-V-0468 FRR No. N/A

## Equipment used During the Examination:

- ☐ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights

- ☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other:

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
RELOOK OF JET PUMP #10	PILG-91-12	00- 542	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-12	542- 562	1 MIL WIRE RESOLVED
CORE SPRAY SPARGER NOZZLE B-25	PILG-91-12	562- 818	* NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-12	818- 870	1 MIL WIRE RESOLVED
MOISTURE SEPARATOR SHROUD HEAD BOLT # 42	PILG-91-12	870- 1039	** NO APPARENT ABNORMAL CONDITIONS
SHROUD HEAD BOLT # 41	PILG-91-12	1039- 1188	** NO APPARENT ABNORMAL CONDITIONS
NW L10 TANK LUG	PILG-91-12	1188- 1535	** NO APPARENT ABNORMAL CONDITIONS
SHROUD HEAD BOLTS 40 THROUGH 29	PILG-91-12	1535- 3164	** NO APPARENT ABNORMAL CONDITIONS
STAND TUBES 25 THROUGH 42	PILG-91-12	3164- 5715	** NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-12	5715- 5726	1 MIL WIRE RESOLVED

M. G. [Signature] III 6-6-91  
EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER EL DATE

COMMENTS: \* A RELOOK AT THE B-25 CORE SPRAY NOZZLE AND "T" BOX TO VERIFY PREVIOUSLY RECORDED INDICATIONS. NO INDICATIONS WERE FOUND.

\*\* RUB AND STAIN MARKS

M. G. [Signature] III 6-12-91  
REVIEWED LEVEL DATE  
[Signature] PM 6/12/91  
REVIEWED TITLE DATE

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FORM 89 4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: <u>PILGRIM</u>	UNIT: <u>1</u>	PROCEDURE No. <u>GE-VT-20V</u>	REPORT NO.
PROJECT NUMBER: <u>91-V-0468</u>		REVISION No. <u>0</u>	<u>PILG-91</u>
		PRA No. <u>N/A</u>	

## Equipment used During the Examination:

- ☒ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights

- ☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other:

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1    ☒ VT-3  
☐ DIRECT    ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
STEAM DRYER			
1 MIL WIRE AND TITLE	PILG-91-13	00-52	1 MIL WIRE RESOLVED
BANK #3 0°	PILG-91-13	52-755	NO APPARENT ABNORMAL CONDITIONS
BANK #2 AND 3, TIE BAR WELD 180° TO 0°	PILG-91-13	755-1084	NO APPARENT ABNORMAL CONDITIONS
BANK #3 MANWAY COVER	PILG-91-13	1084-1136	NO APPARENT ABNORMAL CONDITIONS
BANK #3	PILG-91-13	1136-1175	NO APPARENT ABNORMAL CONDITIONS
BANK #2 TIE BAR WELD 0° TO 180°	PILG-91-13	1175-1291	NO APPARENT ABNORMAL CONDITIONS
BANK #2 BANK TO VERT. WELD 180°	PILG-91-13	1291-1402	NO APPARENT ABNORMAL CONDITIONS
BANK #1 #2 TIE BAR 0° TO 180°	PILG-91-13	1402-1468	NO APPARENT ABNORMAL CONDITIONS
BANK #2 TIE BARS 180° TO 0°	PILG-91-13	1468-1543	NO APPARENT ABNORMAL CONDITIONS
BANK #1 TIE BARS 180° TO 0°	PILG-91-13	1543-1615	NO APPARENT ABNORMAL CONDITIONS
BANK #1 BANK TO VERTICAL WELD 0°	PILG-91-13	1615-1693	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-13	1693-1700	1 MIL WIRE RESOLVED
BANK #2 CORNER WELD EAST SIDE 0° TO 180°	PILG-91-13	1700-1953	NO APPARENT ABNORMAL CONDITIONS

<u>M. J. [Signature]</u> 6-6-91		
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE

## COMMENTS:

REF. GE SIL 474 (ATT 40)  
 STEAM DRYER CHANNEL AND  
 SUPPORT RING.

<u>M. J. [Signature]</u> 6-12-91		
REVIEWED	LEVEL	DATE
<u>M. J. [Signature]</u>	PM	6/12/91
REVIEWED	TITLE	DATE

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FORM 89 4-2-90



## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: <u>PILGRIM</u>	UNIT: <u>1</u>	PROCEDURE No. <u>GE-VT-204</u>	REPORT NO.
		REVISION No. <u>0</u>	
PROJECT NUMBER: <u>91-V-0468</u>		FRR No. <u>N/A</u>	<u>PILG-91</u>

Equipment used During the Examination:

☐ Color Underwater camera  
☐ B/W Underwater camera  
☐ Regular VHS Recorder  
☐ Super VHS Recorder  
☐ Underwater Lights

☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other:

## CAMERA RESOLUTION

☒ Verified 0.007" Diameter wire

☒ Verified V32" Black line on an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☐ VT-1      ☒ VT-3  
☐ DIRECT      ☒ REMOTE

[illegible]

77-6-2000 III	6-6-91
EXAMINER	LEVEL DATE
EXAMINER	LEVEL DATE
EXAMINER	LEVEL DATE
EXAMINER	LEVEL DATE
EXAMINER	LEVEL DATE

COMMENTS:

REF. GE SIL 474 (ATT 40)  
STEAM DRYER CHANNEL AND  
SUPPORT RING.

77.6. <i>Smith</i>	<i>III</i>	6-12-81
REVIEWED	LEVEL	DATE
<i>M. Smith</i>	<i>III</i>	6/12/81
REVIEWED	TITLE	DATE

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EORW 89 4-7-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIMUNIT: 1PROCEDURE No. GE-VT-204

REPORT NO.

REVISION No. 0PROJECT NUMBER: 91-V-0468FRR No. N/APILG-91-

## Equipment used During the Examination:

☐ Color Underwater camera  
☒ B/W Underwater camera  
☒ Regular VHS Recorder  
☒ Super VHS Recorder  
☒ Underwater Lights☐ Service Platform  
☒ Refusing Bridge  
☐ Float Box  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

## CAMERA RESOLUTION

☒ Verified 0.007" Diameter wire☒ Verified V32" Black line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

☐ VT-1☒ VT-3☐ DIRECT☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
"B" CORE SPRAY SPARGER T BOX 345°	PILG-91-14	00-1415	NO APPARENT ABNORMAL CONDITIONS
1 MIL WIRE	PILG-91-14	1415-1484	1 MIL WIRE RESOLVED

<u>M. H. Smith II</u>	<u>6-6-91</u>	
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE
EXAMINER	LEVEL	DATE

## COMMENTS:

THE "B" CORE SPRAY SPARGER, "T" BOX,  
BETWEEN THE T BOX AND THE B25 NOZZLE  
WERE WELD BRUSHED AND VIDEOED <sup>TAPED</sup> WITH  
HIGH RESOLUTION AND SENSITIVITY, TO VERIFY  
PREVIOUSLY RECORDED INDICATIONS

NO INDICATIONS WERE OBSERVED

M. H. Smith III 6-13-91

REVIEWED LEVEL DATE

M. H. Smith PM 6/17/91

REVIEWED TITLE DATE

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FORM 89 4-2-90



GE Nuclear Energy

## INVESSEL VISUAL EXAMINATION DATA SHEET

SITE: PILGRIM UNIT: 1 PROCEDURE No. GE-VT-204 REPORT NO. PILG-91  
PROJECT NUMBER: FI-V-0468 REVISION No. 0 FRR No. N/A

## Equipment used During the Examination:

- ☐ Color Underwater camera  
☒ B/W Underwater camera  
☐ Regular VHS Recorder  
☐ Super VHS Recorder  
☒ Underwater Lights

- ☐ Service Platform  
☐ Refueling Bridge  
☐ Float Box  
☒ Other: PLATFORM  
☐ Other:

## CAMERA RESOLUTION

- ☒ Verified 0.001" Diameter wire  
☒ Verified V32" Black line on  
an 18% Neutral Gray Card

## TYPE OF VISUAL EXAMINATION

- ☐ VT-1 ☒ VT-3  
☐ DIRECT ☒ REMOTE

Component Description	Tape Number	Tape Counts	Examination Results
1 MIL WIRE AND TITLE	PILG-91-15	00 - 24	1 MIL WIRE RESOLVED
LEVELING SCREW BY THE 35° LIFTING LUG	PILG-91-15	24 - 135	@ 2" LONG CRACK
LEVELING SCREW BY THE 815° LIFTING LUG	PILG-91-15	135 - 178	@ 1 1/4" LONG CRACK
LEVELING SCREW BY THE 155° LIFTING LUG	PILG-91-15	178 - 203	NO APPARENT ABNORMAL CONDITIONS
LEVELING SCREW BY THE 335° LIFTING LUG	PILG-91-15	203 - 232	NO APPARENT ABNORMAL CONDITIONS

M. J. Smith III 6-14-91  
EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

EXAMINER LEVEL DATE

## COMMENTS:

SEE EXAMINATION RESULTS FOR COMMENTS

(NONE)

M. J. Smith III 6-14-91  
REVIEWED LEVEL DATE  
M. J. Smith III PM 6/14/91  
REVIEWED TITLE DATE

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FORM 89 4-2-90



## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
 Visual Examination of Reactor Internals and Components  
 By the Use of Underwater TV Camera

Video Tape No.: PILG-91-01

Date: 5/28/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
CAMERA RESOLUTION 1 MIL. WIRE	1 MIL WIRE RESOLVED	YES	NO	000000-001:30	
45" STEAM DRYER SUPPORT BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	001:30-007:48	
135" STEAM DRYER SUPPORT BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	007:19-008:48	
225" STEAM DRYER SUPPORT BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	008:48-011:03	
315" STEAM DRYER SUPPORT BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	011:03-012:17	
3" GUIDE ROD AND BRACKETS	NO APPARENT ABNORMAL CONDITIONS	YES	NO	012:17-019:22	
180" GUIDE ROD AND BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	019:22-025:15	
FLANGE SEALING SURFACE	NO APPARENT ABNORMAL CONDITIONS	YES	NO	025:15-044:13	

Reviewed by: M. A. StammLevel: IIIDate: 05-28-91

# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-01

Date: 5/28/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
45" FEEDWATER SPARGER AND BRACKETS	NO APPARENT ABNORMAL CONDITIONS	YES	NO	044:13-059:48
135" FEEDWATER SPARGER AND BRACKETS	NO APPARENT ABNORMAL CONDITIONS	YES	NO	059:48-114:14
225" FEEDWATER SPARGER AND BRACKETS	NO APPARENT ABNORMAL CONDITIONS	YES	NO	114:14-127:00
315" FEEDWATER SPARGER AND BRACKETS	NO APPARENT ABNORMAL CONDITIONS	YES	NO	127:00-140:25
CORE SPRAY PIPING 0' THROUGH 180"	NO APPARENT ABNORMAL CONDITIONS	YES	NO	140:25-219:49
1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	219:49-220:21

Reviewed by: M. A. [Signature]

Level: III

Date: 05-28-91



## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
 Visual Examination of Reactor Internals and Components  
 By the Use of Underwater TV Camera

Video Tape No.: PILG-91-02

Date: 05/28/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250 RECORDER: PANISONC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50' ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0119	
CORE SPRAY PIPING 180° THROUGH 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0119-1884	
CORE SPRAY SPARGER NOZZLES 0° THROUGH 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1884-2378	
UPPER CORE SPRAY SPARGER 0° THROUGH 180° NOZZLES, BRACKETS AND "T" BOX	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2378-3820	
UPPER CORE SPRAY SPARGER 180° THROUGH 360° NOZZLES, "T" BOX AND BRACKETS	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3820-4458	
LOWER CORE SPRAY SPARGER 0° THROUGH 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4458-4932	

Reviewed by: M. A. HeathLevel: IIIDate: 06-01-91

REF. IE BULLETIN 80-15, AND GE SIL 289.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-02

Date: 5/28/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
LOWER CORE SPRAY SPARGER 180° THROUGH 360°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4932-5852
LOWER CORE SPRAY SPARGER 0° THROUGH 180°	NO APPARENT ABNORMAL CONDITIONS	YLS	NO	5852-5906

Reviewed by: M. G. Smith

Level: VII

Date: 06-01-91

REF. IE BULLETIN 80-13, AND GE SIL 289.

## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-03

Date: 6/01/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250 RECODER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed		Description of Recordable Indications	Accept	Review Required	Tape Counts
LOWER CORE SPRAY SPARGER 0° THRU 180°		NO APPARENT ABNORMAL CONDITIONS	YES	NO	000:00-015:00
LOWER CORE SPRAY SPARGER 180° THRU 360°		NO APPARENT ABNORMAL CONDITIONS	YES	NO	015:00-032:28
UPPER CORE SPRAY SPARGER 0° THRU 180°		NO APPARENT ABNORMAL CONDITIONS	YES	NO	032:28-051:29
UPPER CORE SPRAY SPARGER 180° THRU 360°		NO APPARENT ABNORMAL CONDITIONS	YES	NO	051:29-107:26
CAMERA RESOLUTION 1 MIL WIRE		1 MIL WIRE RESOLVED	YES	NO	107:26-108:12
TOP GUIDE HOLD DOWN BOLTS (360°)		LOOSE SCREW ON GUIDE NO OTHER APPARENT ABNORMAL CONDITIONS	YES	NO	108:12-130:51
CAMERA RESOLUTION 1 MIL WIRE		1 MIL WIRE RESOLVED	YES	NO	130:51-131:33

Reviewed by: M. L. SmithLevel: IIIDate: 06-01-91

SCREW WAS NOTED ON TOP GUIDE.  
REF. IE BULLETIN 80-13, AND GE SIL 289.

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-03

Date: 6/01/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
JET PUMP # 20	NO CONTACT WITH THE SHROUD SIDE SET SCREW	YES	NO	131:33-145:37
JET PUMP # 19	NO APPARENT ABNORMAL CONDITIONS	YES	NO	145:37-159:19
JET PUMP # 18	NO APPARENT ABNORMAL CONDITIONS	YES	NO	159:19-203:07 CONT. ON TAPE # 04.

Reviewed by: M. G. [Signature]Level: IIIDate: 06-01-91

NO CONTACT WITH THE SHROUD SIDE SET SCREW ON JET PUMP # 20.  
REF. GE SIL 420 FOR THE JET PUMP SENSING LINES.  
REF. GE RICSIL 45 FOR THE JET PUMP RISING BRACES.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-04

Date: 5/29/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250 RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed		Description of Recordable Indications	Accept	Review Required	Tape Counts
JET PUMP # 18		NO APPARENT ABNORMAL CONDITIONS	YES	NO	000:00-016:30
JET PUMP # 17		NO APPARENT ABNORMAL CONDITIONS	YES	NO	016:30-026:59
JET PUMP # 16		* NO APPARENT ABNORMAL CONDITIONS	YES	NO	026:59-052:17
CAMERA RESOLUTION 1 MIL WIRE AND TITLE		1 MIL WIRE RESOLVED	YES	NO	052:17-053:05
JET PUMP # 15		NO APPARENT ABNORMAL CONDITIONS	YES	NO	053:02-112:52
JET PUMP # 14		NO APPARENT ABNORMAL CONDITIONS	YES	NO	112:52-128:50
JET PUMP # 13		NO APPARENT ABNORMAL CONDITIONS	YES	NO	128:50-144:29
JET PUMP # 12		NO APPARENT ABNORMAL CONDITIONS	YES	NO	144:29-158:30
JET PUMP # 11		NO APPARENT ABNORMAL CONDITIONS	YES	NO	158:30-203:04

Reviewed by: M. H. Fitch

Level: III

Date: 06-03-91

\* SCRATCHES WERE NOTED ON THE SENSING LINE JET PUMP # 16.  
REF. GE SIL 420 FOR THE JET PUMP SENSING LINES.  
REF. GE RICSIL 45 FOR THE JET PUMP RISER BRACES.

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-05

Date: 5/29/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
JET PUMP # 01	NO APPARENT ABNORMAL CONDITIONS	YES	NO	000:00-007:10	
CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	007:10-007:51	
* JET PUMP # 10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	007:51-019:45	
180" MANWAY COVER	COVERED WITH SEDIMENT	YES	NO	019:45-022:12	
0" MANWAY COVER	COVERED WITH SEDIMENT	YES	NO	022:12-025:29	
JET PUMP # 01	NO APPARENT ABNORMAL CONDITIONS	YES	NO	025:29-040:39	
JET PUMP # 02	* GAP IN SET SCREW SHROUD SIDE	YES	NO	040:39-054:03	
JET PUMP # 03	NO APPARENT ABNORMAL CONDITIONS	YES	NO	054:03-105:01	
JET PUMP # 04	NO APPARENT ABNORMAL CONDITIONS	YES	NO	105:01-116:23	
JET PUMP # 05	NO APPARENT ABNORMAL CONDITIONS	YES	NO	116:23-125:49	

Reviewed by: M. H. [Signature]Level: IIIDate: 06-01-91

\* THERE IS A GAP IN THE SHROUD SIDE SET SCREW JET PUMP # 2  
REF. GE SIL 420 FOR THE JET PUMP SENSING LINES.  
REF. GE RICSIL 45 FOR THE JET PUMP RISER BRACKETS.

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-05

Date: 5/29/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
JET PUMP # 06	NO APPARENT ABNORMAL CONDITIONS	YES	NO	125:49-133:19
JET PUMP # 07	NO APPARENT ABNORMAL CONDITIONS	YES	NO	133:19-143:16
JET PUMP # 08	NO APPARENT ABNORMAL CONDITIONS	YES	NO	143:16-155:26
JET PUMP # 09	** NO APPARENT ABNORMAL CONDITIONS	YES	NO	155:26-206:11
JET PUMP # 10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	206:11-206:50 CONT. ON TAPE # 06
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	206:50-207:25

Reviewed by: M. A. [Signature]Level: IIIDate: 06-01-91

\*\* \*J\* HOOK ON SHROUD LEDGE BETWEEN 8 AND 9.  
THIS \*J\* HOOK HAS BEEN REMOVED ALONG WITH A 3/8" NUT.  
REF. GE SIL 420 FOR THE JET PUMP SENSING LINES.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-86

Date: 5/30/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250 RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
BOTTOM SIDE OF THE TOP GUIDE	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0000-0508	
CORE PLATE	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0508-1049	
JET PUMP # 10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1049-1390	
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	1390-1450	
230" SURVEILLANCE SAMPLE AND BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1450-1658	
185" SURVEILLANCE SAMPLE AND BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1658-1816	
95" SURVEILLANCE SAMPLE AND BRACKET	SAMPLE IS REMOVED	YES	NO	1816-1847	
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	1847-1920	

Reviewed by: M. G. [Signature]

Level: III

Date: 06-01-91

REF. GE SIL 420 FOR THE JET PUMP SENSING LINGS.  
REF. GE RICSIL 45 FOR THE JET PUMP RISER BRACKET.

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Date: 5/30/91

Reviewed by: M. G. Frost Level: III Date: 06-01-91

## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
 Visual Examination of Reactor Internals and Components  
 By the Use of Underwater TV Camera

Video Tape No.: PILG-91-07

Date: 7/30/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	000:00-001:02	
IRM 36-09 NW SIDE ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	001:02-002:34	
IRM 36-41 NW & SE SIDE ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	002:34-006:47	
SRM 36-33	NO APPARENT ABNORMAL CONDITIONS	YES	NO	006:47-015:41	
IRM 28-33	* NO APPARENT ABNORMAL CONDITIONS	YES	NO	015:41-033:20	
IRM 28-25 SE SIDE ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	033:20-035:41	
SRM 28-17 SE, SW AND NW SIDES ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	035:41-043:18	
IRM 28-25 SE AND NW SIDES ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	043:18-048:13	
IRM 28-33 SE AND NE SIDES ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	048:13-052:34	
SRM 28-41 SE AND NW SIDES ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	052:34-056:14	

Reviewed by: M. A. [Signature]Level: IIIDate: 06-06-91

\* RUB MARKS ARE ON IRM 28-33.

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-07

Date: 5/30/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
IRM 12-41 NW AND SE SIDES ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	056:14-101:11
SRM 12-25 SE AND SW SIDES ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	101:11-106:25
IRM 12-09 NW SIDE ONLY	NO APPARENT ABNORMAL CONDITIONS	YES	NO	106:25-108:28
CLAD PATCH AT 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	108:28-109:34
CLAD PATCH AT 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	109:34-111:03
CORE PLATE	NO APPARENT ABNORMAL CONDITIONS	YES	NO	111:03-121:42
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	121:42-121:58
180° MANWAY COVER	NO APPARENT ABNORMAL CONDITION	YES	NO	121:58-126:49
0° MANWAY COVER	NO APPARENT ABNORMAL CONDITION	YES	NO	126:49-129:38

Reviewed by: M. A. [Signature]Level: IIIDate: 06-06-91

RELOOK OF MANWAY COVERS AFTER SEDIMENT WAS REMOVED.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-08

Date: 6/04/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0079	
NONE	NO VIDEO PICTURE	YES	NO	0079-0928	
STEAM DRYER 45" LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0928-1390	
315" LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1390-1960	
225" LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1960-2264	
135" LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2264-2500	
WSW SEAL TO BANK WELD REF. PAR. 6.27.9	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2500-2660	
WNW SEAL TO BANK WELD REF. PAR. 6.27.9	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2660-2793	
WNW - WSW BANK HORZ. WELDS REF. PAR. 6.27.6	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2793-3050	
WSW - WNW SUPPORT RING TO SEAL WELDS REF. PAR. 6.27.10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3050-3563	

Reviewed by: M. H. [Signature]

Level: III

Date: 06-08-91

# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-08

Date: 6/04/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
WSW - WNW SKIRT TO SKIRT HORZ. WELD REF. PAR. 6.27.15	1 MIL WIRE RESOLVED	YES	NO	3563-3794
NW VERTICAL BANK WELD REF. PAR. 6.27.3	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3794-4295
NW SHELL HORZ. WELD REF. PAR. 6.27.4	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4295-4410
NW SEAL TO BANK WELDS REF. PAR. 6.27.9	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4410-4565
NW UPPER SUPPORT SEAL TO RING WELD REF. PAR. 6.27.10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4565-4709
NW SKIRT TO SKIRT WELD HORZ. WELD REF. PAR. 6.27.13	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4709-4809
NW SKIRT TO SKIRT WELD REF. PAR. 6.27.15 BRACKET	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4809-5018
NW BELOW LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5018-5237
SW VERTICAL WELDS REF. PAR. 6.27.3	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5237-5928

Reviewed by: M. A. [Signature]

Level: III

Date: 06-08-91

REF. GE SIL 474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

IN VESSEL VISUAL EXAMINATION DATA SHEET  
PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-08

Date: 05/28/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
SW SEAL TO BANK WELD REF. PAR. 6.27.9	1 MIL WIRE RESOLVED	YES	NO	5928-5972
SW HORZ. WELD REF. PAR. 6.27.4 & 6.27.6	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5972-6140
SW HORZ. UPPER RING TO SEAL WELD REF. PAR. 6.27.10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	6140-6233
SW HORZ. UPPER SUPPORT TO SKIRT WELD REF. PAR. 6.27.13	NO APPARENT ABNORMAL CONDITIONS	YES	NO	6233-6485
SW-SSW HORZ. SKIRT TO SKIRT WELD REF. PAR. 6.27.15	NO APPARENT ABNORMAL CONDITIONS	YES	NO	6485-6718

Reviewed by:

*M. G. Smith*

Level:

*III*

Date:

*06-08-91*

REF. GE SIL 474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-09

Date: 6/04/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANISONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
STEAM DRYER CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0065	
NW VERTICAL BANK WELD REF. PAR. 6.27.3	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0065-0211	
6" VERTICAL WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0211-0410	
NE VERTICAL BANK WELDS 1 THRU 4	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0410-1016	
NE TO NW SUPPORT RING AND VERTICAL WELD	* SEE BELOW AND TAPE PILG-91-15	NO	YES	1016-2668	
NW TO NE SKIRT TO SKIRT WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2668-2980	
NE VERTICAL CHANNEL WELD BELOW LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2980-3370	
6" GUIDE AND CHANNEL WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3370-3560	
SOUTH BANK (5) TO SEAL HORZ. WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3560-3980	
SW TO SE SEAL TO SUPPORT RING WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3980-4180	

Reviewed by: M. G. [Signature]Level: IIIDate: 06-10-91

\* THERE IS A 2" LONG CRACK ON THE 35 LEVELING SCREW SEE TAPE PILG-91-15 FOR DETAILS.

REF. GE SIL.474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-09

Date: 6/04/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
SE TO SW SUPPORT RING TO SKIRT WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4180-4433
SW TO SE SKIRT TO SKIRT HORIZ. WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4433-4658
180 VERTICAL BANK WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4658-4907
SE VERTICAL BANK WELDS #4 AND #5	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4907-5025
GUIDE ROD CHANNEL AND VERTICAL BANK WELD #2	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5025-5298
BELOW LUG SW CORNER	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5298-5454
BEHIND LUG SE CORNER	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5454-5491
BELOW LUG SE CORNER	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5491-5615
HORIZ. WELD BANK #5	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5615-5796
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	5615-5796

Reviewed by: M. A. Fitch

Level: III

Date: 06-10-91

REF. GE SIL 474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-10

Date: 6/04/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
MOISTURE SEPARATOR 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0126	
SHROUD HEAD BOLT #48	RUB MARKS AND SCRATCHES	YES	NO	0126-0547	
SHROUD HEAD BOLT #47	RUB MARKS	YES	NO	0547-0740	
SHROUD HEAD BOLT #46	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0740-1020	
SHROUD HEAD BOLT #45	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1020-1145	
SHROUD HEAD BOLT #44	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1145-1240	
SHROUD HEAD BOLT #43	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1240-1412	
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	1412-1458	
STAND TUBES STARTING AT 0" #1	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1458-1570	
STAND TUBE #2	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1570-1620	
STAND TUBE #3	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1620-1740	

Reviewed by: M. H. [Signature]Level: IIIDate: 06-10-91

THERE WERE RUB MARKS AND SCRATCHES RECORDED ON THE SHROUD HEAD BOLTS.  
REF. GE SIL 474 (ATT40) STEAM DRYER AND SUPPORT RING.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-10

Date: 6/04/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
STAND TUBE #4	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1740-1820
STAND TUBE #5	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1820-1880
STAND TUBE #6	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1880-1945
STAND TUBE #7	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1945-2099
STAND TUBE #8	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2099-2223
STAND TUBE #9	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2223-2355
STAND TUBE #10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2355-2460
STAND TUBE #11	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2460-2637
STAND TUBE #12	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2637-2767
STAND TUBE #13	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2767-2920
STAND TUBE #14	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2920-3029

Reviewed by: M. H. [Signature]

Level: III

Date: 06-10-91

## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-10

Date: 6/04/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
STAND TUPE #15	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3029-3153
STAND TUBE #16	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3153-3277
STAND TUBE #17	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3277-3495
STAND TUBE #19	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3495-3660
STAND TUBE #20	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3660-3860
STAND TUBE #21	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3860-4183
STAND TUBE #22	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4183-4326
STAND TUBE #23	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4326-4542
STAND TUBE #24	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4542-4680
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	4680-4700

Reviewed by:

M. H. Smith

Level:

III

Date:

06-10-91

# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-10

Date: 6/04/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
STEAM DRYER NE VERTICAL VENT # 5 SE VERTICAL VENT # 1	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4700-4856
EAST SEAL TO BANK WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4856-4960
SE - NE SEAL TO SUPPORT RING WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4960-5123
SE - NE UPPER SUPPORT RING TO SKIRT WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5123-5312
LOWER SEAL TO BANK WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5312-5430
SKIRT TO SKIRT HORZ. WELD	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5430-5736
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	5736-5745

Reviewed by:

*M. L. Smith*

Level:

*III*

Date:

*6-10-91*

REF. GE SIL 474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.



## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
 Visual Examination of Reactor Internals and Components  
 By the Use of Underwater TV Camera

Video Tape No.: PILG-91-11

Date: 6/05/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
MOISTURE SEPERATOR CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0030	
SHROUD HEAD BOLT #01	NO APPARENT ABNORMAL CONDITIONS */**	YES	NO	0030-0470	
SHROUD HEAD BOLT #02	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	0470-0743	
SHROUD HEAD BOLT #03	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	0743-1010	
SHROUD HEAD BOLT #04	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1010-1198	
SHROUD HEAD BOLT #05	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1198-1373	
SHROUD HEAD BOLT #06	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1373-1488	
SHROUD HEAD BOLT #07	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1488-1714	
SHROUD HEAD BOLT #08	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1714-1874	
SHROUD HEAD BOLT #09	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1874-2018	

Reviewed by: M.A. ZanderLevel: IIIDate: 06-11-91

\* SCRATCHES

\*\* STAIN MARKS AND RUB/WEAR MARKS

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-11

Date: 6/05/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Count
SHROUD HEAD BOLT #10	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2018-2165
SHROUD HEAD BOLT #11	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2165-2307
SHROUD HEAD BOLT #12	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2307-2460
SHROUD HEAD BOLT #13	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2460-2583
SHROUD HEAD BOLT #14	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2583-2732
SHROUD HEAD BOLT #15	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2732-2849
SHROUD HEAD BOLT #16	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2849-2943
SHROUD HEAD BOLT #17	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2943-3203
SHROUD HEAD BOLT #18	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	3203-3400
SHROUD HEAD BOLT #19	NO APPARENT ABNORMAL CONDITIONS */**	YES	NO	3400-3637
SHROUD HEAD BOLT #20	NO APPARENT ABNORMAL CONDITIONS */**	YES	NO	3637-3772

Reviewed by: M. A. [Signature]

Level: III

Date: 06-11-91

\* SCRATCHES

\*\* STAIN MARKS AND RUB/WEAR MARKS

# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-11

Date: 6/01/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
SHROUD HEAD BOLT #21	NO APPARENT ABNORMAL CONDITIONS */**	YES	NO	3772-4098
SHROUD HEAD BOLT #22	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	4098-4283
SHROUD HEAD BOLT #23	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	4283-4420
SHROUD HEAD BOLT #24	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	4420-4606
LIFTING LUG BETWEEN BOLTS #24 AND #25	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	4606-4829
SHROUD HEAD BOLT #25	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	4829-4965
SHROUD HEAD BOLT #26	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	4965-5230
SHROUD HEAD BOLT #27	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	5230-5401
SHROUD HEAD BOLT #28	NO APPARENT ABNORMAL CONDITIONS */**	YES	NO	5401-5518
115" LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS */**	YES	NO	5518-5699
10" LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	5699-5946
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	5946-5956

Reviewed by: M. A. Smith

Level: III

Date: 06-11-91

\* SCRATCHES

\*\* STAINS AND RUB/WEAR MARKS.

# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-12

Date: 6/06/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
RE LOOK OF JET PUMP # 10	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0000-0542	
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	0542-0562	
NOZZLE B-25 CORE SPRAY SPARGER	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	0562-0818	
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	0818-0870	
MOISTURE SEPERATOR SHROUD HEAD BOLT #42	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	0870-1039	
SHROUD HEAD BOLT #41	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1039-1188	
NW LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1188-1535	
SHROUD HEAD BOLT #40	NO APPARENT ABNORMAL CNDITIONS **	YES	NO	1535-1723	
SHROUD HEAD BOLT #39	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1723-1881	
SHROUD HEAD BOLT #38	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	1881-2042	
SHROUD HEAD BOLT #37	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2042-2244	

Reviewed by: M. H. [Signature]

Level: III

Date: 06-12-91

\* RELOOK AT THE B-25 NOZZLE AREA AND T BOX FOR PREVIOUSLY RECORDED INDICATIONS. NO INDICATIONS WERE FOUND.

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# IN VESSEL VISUAL EXAMINATION DATA SHEET

## PILGRIM NUCLEAR POWER STATION Visual Examination of Reactor Internals and Components By the Use of Underwater TV Camera

Video Tape No.: PILG-91-12

Date: 6/66/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
SHROUD HEAD BOLT #36	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2244-2375
SHROUD HEAD BOLT #35	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2375-2520
SHROUD HEAD BOLT #34	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2520-2616
SHROUD HEAD BOLT #33	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2616-2692
SHROUD HEAD BOLT #32	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2692-2776
SHROUD HEAD BOLT #31	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2776-2934
SHROUD HEAD BOLT #30	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	2934-3038
SHROUD HEAD BOLT #29	NO APPARENT ABNORMAL CONDITIONS **	YES	NO	3038-3164
STAND TUBE #25	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	3164-3545
STAND TUBE #26	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3545-3781
STAND TUBE #27	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3781-4014

Reviewed by: M. H. [Signature]

Level: III

Date: 06-12-91

\* STAIN MARKS

\*\* WEAR/RUB MARKS AND STAIN MARKS



## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-12

Date: 6/06/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
STAND TUBE #28	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	4014-4227
STAND TUBE #29	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4227-4422
STAND TUBE #30	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	4422-4542
STAND TUBE #31	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	4542-4659
STAND TUBE #32	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	4659-4808
STAND TUBE #33	NO APPARENT ABNORMAL CONDITIONS	YES	NO	4808-4898
STAND TUBE #34	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	4898-5011
STAND TUBE #35	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	5011-5076
STAND TUBE #36	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5076-5183
STAND TUBE #37	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	5183-5295
STAND TUBE #38	NO APPARENT ABNORMAL CONDITIONS *	YES	NO	5295-5386

Reviewed by: M. A. [Signature]Level: IIIDate: 06-12-91

\* STAIN MARKS

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Date: 6/06/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
STAND TUBE #39	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5386-5440
STAND TUBE #40	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5440-5522
STAND TUBE #41	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5522-5590
STAND TUBE #42	NO APPARENT ABNORMAL CONDITIONS	YES	NO	5590-5715
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	5715-5726

Date: 06-12-91

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-13

Date: 6/06/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV- 1250                      RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50'S ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0052	
STEAM DRYER BANK #3 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0052-0755	
BANK #2 AND #3 TIE BAR WELD 180° TO 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0755-1084	
BANK #3 AND MANWAY COVER	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1084-1136	
BANK #3	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1136-1175	
BANK #2 TIE BAR WELD 0° TO 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1175-1291	
BANK #2 BANK TO VERTICAL WELD 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1291-1402	
BANK #2 TIE BAR WELD 180° TO 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1402-1468	
BANK #2 AND #1 TIE BAR WELD 0° TO 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1468-1543	
BANK #1 TIE BAR WELD 180° TO 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1543-1615	
BANK #1 BANK TO VERTICAL WELD 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1615-1693	

Reviewed by: M. J. HeathLevel: IIIDate: 06-12-91

REF. GE SIL 474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-13

Date: 6/86/91

Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts
CAMERA RESOLUTION 1 MIL WIRE	1 MIL WIRE RESOLVED	YES	NO	1693-1700
BANK #2 CORNER WELD EAST SIDE 0° TO 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1700-1953
BANK #2 CORNER WELD WEST SIDE 0° TO 180°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	1953-2231
BANK #3 BANK TO VERTICAL PLATE WELD 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2231-2446
BANK #1 CORNER WELD 180° TO 0°	NO APPARENT ABNORMAL CONDITIONS	YES	NO	2446-3448
BANK #4 HANWAY EAST SIDE	NO APPARENT ABNORMAL CONDITIONS	YES	NO	3448-3504

Reviewed by: M. A. [Signature] Level: III Date: 06-12-91

REF. GE SIL 474 (ATT 40) STEAM DRYER CHANNEL AND SUPPORT RING.

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Date: 6/06/91

Reviewed by: M. A. [Signature] Level: III Date: 06-13-91

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## IN VESSEL VISUAL EXAMINATION DATA SHEET

PILGRIM NUCLEAR POWER STATION  
Visual Examination of Reactor Internals and Components  
By the Use of Underwater TV Camera

Video Tape No.: PILG-91-15

Date: 6/14/91

PERSONNEL	LEVEL	EQUIPMENT - CALIBRATION - TECHNIQUE			
M. HEATH M. STAMM S. MONTICONE	III III II	CAMERA: ETV-1250 RECORDER: PANASONIC AG-6200 1 MIL WIRE VISIBLE ON ALL RESOLUTION CHECKS  TECHNIQUE DESCRIPTION: HAND HELD CAMERA, STRAIGHT ON LENS, 90 LENS, TWIN 50's ON CAMERA FOR LIGHTING			
Component(s) and/or Area Viewed	Description of Recordable Indications	Accept	Review Required	Tape Counts	
CAMERA RESOLUTION 1 MIL WIRE AND TITLE	1 MIL WIRE RESOLVED	YES	NO	0000-0024	
LEVELING SCREW BY THE 35 LIFTING LUG	Ø 2" LONG CRACK	YES	YES*	0024-0135	
LEVELING SCREW BY THE 215 LIFTING LUG	Ø 1 3/4" LONG CRACK	YES	YES*	0135-0178	
LEVELING SCREW BY THE 155 LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0178-0203	
LEVELING SCREW BY THE 335 LIFTING LUG	NO APPARENT ABNORMAL CONDITIONS	YES	NO	0203-0232	

Reviewed by: M. A. [Signature]Level: IIIDate: 06-14-91

REF. GE NCR-E-68645-008  
 REF. GE LETTER (EVALUATION OF STEAM DRYER LEVELING SCREW CRACKS 19 JUNE 91),  
 RECOMMENDS TO RUN AS IS.

57 of 61



General Electric Company  
175 Cambridge Avenue, San Jose, CA 95125

19 June 1991

M. E. Shepherd  
Site Services Manager  
Pilgrim Station

SUBJECT: Evaluation of Steam Dryer Leveling Screw Cracks

REFERENCES:

1. DRF B13-01538-19
2. FDDR MK1-0505 Rev 3 Pilgrim Dryer Repair
3. EAS 97-0887 August 1987, Pilgrim Nuclear Power Station  
Steam Dryer Evaluation

GE Nuclear Energy has reviewed and evaluated video tapes of the visual inspection of the steam dryer at the Pilgrim Station. The purpose of this letter is to report the results of that evaluation. The verification for this letter is contained in Reference 1.

BACKGROUND:

In the 1987 refueling outage cracks were observed adjacent to the tack welds for two of the four steam dryer leveling screws. The leveling screws with cracked tack welds were located at 35 and 215 degrees. The cracks extended for the full length of the tack welds. There was no evidence that the leveling screws had rotated due to the cracked welds. The cracked tack welds had performed like a mechanical locking device. These cracks were repaired per Reference 2 and evaluated in Reference 3. The repair consisted of adding two new tack welds to each of the two leveling screws with cracked tack welds. The welding was performed underwater.

The original construction tack weld design was one 0.25 inch fillet weld 0.50 inch long for each leveling screw. The repair tack weld design was two 0.375 inch fillet welds 1.0 inch long for each leveling screw. The cracked original construction tack welds were not removed.

## DISCUSSION:

During the 1991 refueling outage cracks were observed adjacent to the same two leveling screws. Since the original cracks were not removed, this by itself was to be expected. However, the current cracks are longer than those in 1987. The cracks have propagated into the new tack welds.

The current length of the cracks is difficult to accurately determine as no measurement device was lowered and included in the video. The design size of welds per AWS is a minimum. Thus the actual tack welds could be larger than the drawing specified value. It is judged that all three tack welds are significantly larger than the design length. The tack welds are the only visible feature that can be used to estimate the length of the cracks. It is judged that the crack adjacent the 35 degree leveling screw is approximately 150 to 180 degrees around the circumference of the screw. One end of the crack can be clearly seen. It is judged that the crack adjacent the 215 degree leveling screw extends the full length of the inspection. Neither end of the crack is visible. It is judged that the crack length is greater than 180 degrees. The ends of the tack welds behind the leveling screws are not visible. Thus the total length of the welds can not be quantified. For both the 35 and the 215 degree leveling screws, the cracks are open a small amount adjacent to the original tack welds and are much tighter adjacent to the repair tack welds.

The cracks are primarily located in the dryer support ring at the toe of the tack welds. Since the repair tack welds are larger than the original tack weld, the cracks do not follow a circular path. Instead the cracks follow the irregular contour of the tack welds.

7  
The cause of the cracks was stated in Reference 3 to be fatigue. The current judgement is that the cause of the cracks is intergranular stress corrosion cracking (IGSCC). The bases for the revised judgement are as follows. (1) A fatigue crack would follow a smooth well defined path along the region of maximum alternating stress. These cracks do not follow a smooth path. These cracks are not located in the region of highest alternating stress, which for a fillet weld is through the throat of the weld. These cracks instead follow the irregular path of lower stress at the toe of the fillet weld. (2) Many BWR's have reported IGSCC cracks in the steam dryer support ring. All of these cracks have been located within approximately one inch of a weld. These cracks have been shown to be IGSCC through the use of metallographic examination of crack samples. The support ring is fabricated by cold rolling a piece of flat plate. Then many pieces are welded to the support ring without any heat treatment. Thus the support ring is sensitized due to both cold work and welding. The support ring also has significant residual stress due to both rolling and welding.

(  
The leveling screws are used to transmit the weight of the steam dryer to the four reactor pressure vessel (RPV) brackets. At initial reactor assembly the four leveling screws were installed to be in contact with their respective RPV bracket and then tack welded to lock them in position. The only purpose of the tack welds is to prevent turning of the leveling screws. The leveling screws are loaded in compression. Thus the highest loaded threads are at the bottom of the screw (the end opposite the tack welds).

The steam dryer is classified as not safety related and is not under the jurisdiction of the ASME Code.

## RECOMMENDATION:

GE recommends that the cracks be dispositioned as accept as is. GE also recommends that the cracks be visually inspected during the next refueling outage to determine if there had been any leveling screw rotation or significant crack extension. The bases for these recommendations are as follows. (1) There currently is adequate uncracked weld on the 35 degree leveling screws. (2) The growth rate of the cracks since 1987 has been slow enough such that sufficient tack weld should remain on the 35 degree leveling screw at least until the next refueling outage to perform the locking function. (3) It is not known if the crack adjacent to the 215 degree leveling screw extends the full length of the tack welds because the ends of the crack and the ends of the tack weld are not visible. Since the crack adjacent to the repair tack welds is tight, it is judged that the crack has not propagated through the full thickness of the tack welds. (4) Even if the crack should propagate completely through the weld thickness and all the way around the leveling screw, the weld will perform its function because the crack contour will not allow the screw to turn. In essence the completely cracked tack weld would become a mechanical locking device. This was demonstrated by the lack of leveling screw rotation that was observed in 1987. (5) Even if it is postulated that the leveling screws turn sufficiently to take them out of contact with the RPV brackets, there will be no effect on dryer performance and there will be no safety consequences. Of course, in this extreme case the repair necessary during the next refueling outage may be more extensive.

Prepared by

*J. E. Charnley*

J. E. Charnley  
Principal Engineer  
Reactor Design Engineering

Verified by

*Marl O. Lenz*

M. O. Lenz  
Engineer  
Reactor Components Design



111 GRIM NUCLEAR POWER STATION  
IN VESSEL VISUAL INSPECTIONS  
EIGHTH REFUELING AND INSPECTION OUTAGE  
SECTION IV  
TRAVELER



GE Nuclear Energy

CALL 8576

PILGRIM NUCLEAR POWER STATION RFO #8  
GE TRAVELER  
ISI

DESCRIPTION: In Vessel Visual Inspection

TRAVELER NO.: 19101307-1

REVISION: 0

PAGE 1 OF 4

**WORK COPY**

PROJECT No: PIL RFO B

DOCUMENT RELEASED FOR PRODUCTION	
ENGINEERING	DATE 5-8-91
QUALITY ASSURANCE	DATE 5-22-91

SITE MGR APPROV / DATE:

QC APPROV / DATE:

IF REQUIRED CLIENT APPROV / DATE:

ANI APPROV / DATE:

TIME REVIEWED

DATE 5/24/91

Seq. No	OPERATION EXAMINATION OR TEST	PROCEDURE INSTRUCTION and REV.	HOLD FOR CHECK POINT					NCR NO.  RELEASED BY DATE	SEQUENCE COMPLETED			
			P	QC	CL	ANI	NCR		PROD BY DATE	QC BY DATE	CLIENT BY DATE	ANI BY DATE
1A	Review Procedure	Proc TP91-080 REV C	H	L.K. 5/24/91	C 5/24/91				5/24/91		Review L.K. 5/24/91	
1B	Review MR	MR 19101307	H	L.K. 5/24/91	C 5/24/91				5/24/91		Review L.K. 5/24/91	
2	Notify Watch Engineer that inspections are starting		H	L.K. 5/24/91	C 5/24/91				5/24/91		Review L.K. 5/24/91	
3A	Verify all Required Insp. Equip. is in place and operating properly	Proc TP91-080 REV D	H	L.K. 5/24/91	C 5/24/91				5/24/91		Review L.K. 5/24/91	

Also (Note) W: Notify O&E prior to starting each step. However it is not necessary to hold up job. L.K. 5/24/91



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# TRAVELER FOLLOW PAGE

11:0

TRAVELER No:19101307-1

Rev.:3

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Seq. No	OPERATION EXAMINATION OR TEST	PROCEDURE INSTRUCTION and REV.	HOLD OR CHECK POINT					MCR NO.	SEQUENCE COMPLETED BY/DATE			
			P	QC	CL	AME	MCW		RELEASED BY DATE	PT TO DATE	QC BY DATE	CLIENT BY DATE
3B	Perform Calibration Requirements Per Sec. 5.0 of Proc. (Verify as req.)	Proc TP91-000 REV O	N	C	C					5/28/91	5/28/91	7/1/91
3C	Water clarity shall be estab. and judged satisfactory by the lead GE examiner	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4A	Perform Insp. of Core Spray Spargers Ref. Sec 6.17 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4B	Perform Insp. of Jet Pump Assemblies Ref. Sec. 6.18 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4C	Perform Insp. of Jet Pump Sensing Lines Ref. Sec. 6.19 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4D	Perform Insp. of Shroud Support Plate Weld Ref. Sec. 6.20 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4E	Perform Insp. of Shroud Ref. Sec. 6.21 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4F	Perform Insp. of Shroud Support Access Covers Ref. Sec. 6.22 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4G	Perform Insp. of Instrument Dry Tubes Ref. Sec. 6.23 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4H	Perform Insp. of Surveillance Scribe Holders Ref. Sec. 6.24 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91
4I	Perform Insp. of Cladding Patches Ref. Sec. 6.25 of Proc.	Proc TP91-000 REV O	N	L.R. 5/28/91	L.R. 5/28/91					5/28/91	5/28/91	5/28/91



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TRAVELER No:19101307-1

Rev.:0

3 OF 4

Seq. No	OPERATION EXAMINATION OR TEST	PROCEDURE INSTRUCTION and REV.	HOLD OR CHECK POINT				MCR NO.	SEQUENCE COMPLETED BY/DATE			
			P	QC	CL	AMI		PROD BY/ DATE	QC BY/ DATE	CLIENT BY/ DATE	AMI BY/ DATE
4J	Perform Insp. of Guide Rod Ref. Sec 6.8 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		W.A. C 5/29/91	
4K	Perform Insp. of Steam Dryer Support Brackets Ref. Sec 6.9 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4L	Perform Insp. of Feedwater Sparger and Brackets Ref. Sec. 6.12 of Procedure	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4M	Perform Insp. of Feedwater Spargers Ref. Sec. 6.13 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4N	Perform Insp. of Feedwater Nozzles Ref. Sec. 6.14 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4O	Perform Insp. of Core Spray Internal Piping Wall Brackets Ref. Sec. 6.15 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4P	Perform Insp. of Core Spray Internal Piping Ref. 6.16 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4Q	Perform Insp. of CRD Nozzle Ref Sec. 6.25 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4R	Perform Insp. of Top Guide Hold Down Ref. Sec. 6.26 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4S	Perform Insp. of Steam Dryer Ref. Sec. 6.27 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	
4T	Perform Insp. of Steam Separator Ref. Sec. 6.28 of Proc.	Proc TP91-080 REV D	N	L.R. C Wt 5/29/91	L.R. C Wt 5/29/91			5/29/91		L.R. C 5/29/91	



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TRAVELER NO:19101307-1

REV.:C

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Seq. No	OPERATION EXAMINATION OR TEST	PROCEDURE INSTRUCTION and REV.	HOLD OR CHECK POINT				MCR NO.	SEQUENCE COMPLETED			
			P	OC	CL	AMT		PROD BY/ DATE	OC BY/ DATE	CLIENT BY/ DATE	AMT BY/ DATE
4U	Perform Insp. of Steam Separator Shroud Head Bolts Ref. Sec. 6.29 of Proc.	Proc TP91-080 REV D	N	L.R. W Slope	C W Slope			6-5-91 6-5-91			
4V	Perform Direct Visual Insp. of Steam Dryer Hold down Brackets Ref. Sec. 6.10 of Proc.	Proc TP91-080 REV D	N	L.R. W Slope	C W Slope			6-5-91 6-5-91			
4W	Perform Direct Visual Insp. of Reactor Pressure Vessel Head Internal Ref. Sec. 6.11 of Proc.	Proc TP91-080 REV D	N	L.R. W Slope	C W Slope			6-5-91 6-5-91			
5	Level III Review 1991 Tapes	Proc TP91-080 REV D	N	L.R. W Slope	C W Slope						
6	Independent Level III Review of Tapes and Final paperwork	Proc TP91-080 REV D	N	L.R. W Slope	C W Slope	R					
7	OC Review	Proc TP91-080 REV D	N	L.R. W Slope	C W Slope						

Client Review By: \_\_\_\_\_

Date: \_\_\_\_\_

R-Review.

Document  
Control  
Number  
MT0548





GE Nuclear Energy

# WORK COPY

PILGRIM NUCLEAR POWER STATION RFO #8

GE TRAVELER  
MECHANICAL

PROJECT: PNPS RFO 8

DESCRIPTION: VESSEL ACCESS STUDY

TRAVELER NO.: 19054010-1

REVISION: 0

PAGE 1 OF 2

PROJECT No: PIL RFO 8

DOCUMENT  
RELEASED FOR PRODUCTION

ENGINEERING Shall Felt 5-28-91 DATE  
QUALITY ASSURANCE Shall Felt 5-28-91 DATE

SITE MGR APPRV / DATE: Shall Felt 5-28-91

QC APPRV / DATE: Shall Felt 5-28-91

IF REQUIRED CLIENT APPRV / DATE: Shall Felt 6/3/91

ANI APPRV / DATE: N/A 5-28-91

WVE REVIEWED Shall Felt - DA 6-3-91

Seq. No	OPERATION EXAMINATION OR TEST	PROCEDURE INSTRUCTION and REV.	HOLD OR CHECK POINT					MCR NO.	SEQUENCE COMPLETED				
			P	QC	CL	ANI	MFR		RELEASED BY DATE	PROD BY DATE	QC BY DATE	CLIENT BY DATE	ANI BY DATE
1A	Review Procedure	1P91-0B6 Rev.0	2							<u>M. Felt</u> 6-3-91			
1B	Review MR	MR 19054010	H							<u>M. Felt</u> 6-3-91			
2	Notify Watch Engineer that Vessel Access Study is starting		H							<u>M. Felt</u> 6-3-91			



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TRAVELER FOLLOW PAGE

TRAVELER No:19054010-1

Rev.: 0

2 OF 2

Seq. No	OPERATION EXAMINATION OR TEST	PROCEDURE INSTRUCTION and REV.	HOLD OR CHECK POINT					NCR NO.	SEQUENCE COMPLETED BY/DATE			
			P	QC	CL	AMI	ROR		RELEASED BY/ DATE	PROD BY/ DATE	QC BY/ DATE	CLIENT BY/ DATE
3	Verify all personnel are trained IAW this procedure document training on SPCS	TP91-086 Rev.0 SPCS 19054010-1-1 Rev. 0	H	C					6-3-91	6-3-91		
4	Verify safety requirements are met. Reference Sec. 6.0 of procedure	TP91-086 Rev.0	H						6-3-91	6-3-91		
5	Establish all prerequisites are met (as applicable) per Sec. 7.0 of procedure	TP91-086 Rev.0	H						6-3-91	6-3-91		
6	Verify all required tooling & equipment are in place and in working order. Ref Sec. 8.0 of procedure	TP91-086 Rev.0	H						6-3-91	6-3-91		
7	Perform access study per Sec. 10.0 of procedure. Document the results on SPCS	TP91-086 Rev.0 SPCS 19054010-1-2 Rev. 0	H						6-3-91	6-3-91		
8	Review final paper work	TP91-086 Rev.0	H									
9	QC Review			H								

Document Control Number

Date:

Client Review By:

Original transfer to be signed by QC  
□ COM. on form 6-3-91/6-4-91  
WILL DO PAPER WORK IN SAN JOSE MAY TAKE 1/2 WEEKS  
AND



GE Nuclear Energy

## SPECIAL PROCESS CONTROL SHEET

PROJECT	ISI PNPS RFO 8	PROJECT No.: PILGRIM RFO 8
SPCS No: 19054010-1-2	Rev: 0	PAGE 1 OF 1
PRODUCTION REVIEW BY :	<u>Mark E. Hall</u> 5-28-11 QC APPRV : <u>Raymond</u> 5-28-11	
DESCRIPTION : In Vessel Clearance Verification		
REFERENCES : TP91-086 REV. 0 Traveler 19054010-1 Sec. 7, Rev. 0		
PNPS RFO #8		
<p>PERFORM ACCESS STUDY PER Sec. 10.0 OF TP91-086 Rev. 0</p> <p>Document the results on attachment 2,3,4 &amp; 5</p>		
Review By: Initial/Date	Approved By: QC Initial/Date	



GE Nuclear Energy

## SPECIAL PROCESS CONTROL SHEET

PROJECT	ISI PNPS RFO B	PROJECT No.: PILGRIM RFO B
SPCS No: 19054010-1-1	Rev: 10	PAGE 1 OF 1
PRODUCTION REVIEW BY	1. <u>Shane E. Forster</u> 5-22-91 QC APPRV: <u>R. Smith</u> 5-24-91	
DESCRIPTION: TRAINING RECORD		
REFERENCES: 1. TP91-086 REV. 0 Traveler 19054010-1 Seq. 3, Rev. 0		
PNPS RFO #8		
<p>VERIFY ALL PERSONNEL ARE TRAINED IAW TP91-086 Rev. 0</p> <p>DOCUMENT THIS TRAINING ON ATTACHMENT 1 of TP91-086 Rev.0</p>		
Review By: Initial/Date	Approved By: QC Initial/Date	

PILGRIM NUCLEAR POWER STATION  
INVESSEL VISUAL INSPECTIONS  
EIGHTH REFUELING AND INSPECTION OUTAGE  
SECTION V  
PROCEDURE



BOSTON EDISON

PILGRIM NUCLEAR POWER STATION

Temporary Procedure No. TP91-080

INVESSEL VISUAL INSPECTION (IVVI) PROCEDURE FOR  
BWR-3 REACTOR PRESSURE VESSEL INTERNALS

REVIEWERS AND APPROVERS

<i>[Signature]</i> Procedure Writer	5/6/91 Date
<i>B Perkins</i> Technical Reviewer	5/7/91 Date
<i>[Signature]</i> Validator	5/7/91 Date
<i>[Signature]</i> Procedure Owner	5/8/91 Date
Exempt per BEQAM 5.2.5 <sup>Asm</sup> OAD Manager	5/7/91 Date
NOT REQ'd JAS ORC Chairman	5-10-91 Date
D. E. <i>[Signature]</i> Planning & Outage Manager	5-13-91 Date

OC REVIEW REQUIRED

~~QA PROGRAM RELATED~~ *for*

SAFETY REVIEW ~~REQUIRED~~  
NOT REQUIRED

ORC REVIEW ~~REQUIRED~~  
NOT REQUIRED

Effective Date: 5-14-91

Expiration Date: 11-10-91



## GE Nuclear Energy

PROCEDURE NO.: GE-VT-204

TITLE

REVISION NO.: 2

INVESSEL VISUAL INSPECTION (IVVI) PROCEDURE FOR  
BWR-3 REACTOR PRESSURE VESSEL INTERNALS

PREPARED BY:

DATE: 4/10/91 GE LEVEL: III

REVIEWED BY:

DATE: APRIL 10, 1991 GE LEVEL: III

APPROVED FOR USE BY:

DATE: APRIL 10, 1991

COMMENTS:

FORM 913 4-08-90



GE Nuclear Energy

NO. GE-YT-204 REV. 0 PAGE 1 OF 24  
TITLE: INVESSEL VISUAL INSPECTION (IVVI)  
PROCEDURE FOR BWR 3 RPV INTERNALS

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4.0	EQUIPMENT	3
5.0	CALIBRATION	5
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GE Nuclear Energy

NO. GE-VT-294 REV. 0 PAGE 2 OF 24  
TITLE: INVESSEL VISUAL INSPECTION (IVVI)  
PROCEDURE FOR BWR 3 RPV INTERNALS

## 1.0 SCOPE

- 1.1 This procedure defines the method and requirements for VT-1 and VT-3, Invesel Visual Inspection (IVVI) of the Reactor Pressure Vessel (RPV), General Electric Boiling Water Reactor (BWR), type YKREE (3) internals which are made accessible during scheduled refueling and maintenance outages. This procedure meets the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Code, Table IWB-2500, Examination Categories B-N-1 and B-N-2. Augmented inspection requirements are also defined in this procedure.
- 1.2 This procedure can be utilized in its entirety or portions thereof, as directed by the Inservice Inspection (ISI) Program or the specified outage workscope. The inspections can be conducted in any order so as to allow for increase in production or to support other operations during refueling and maintenance outages.

## 2.0 REFERENCES

- 2.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section V and XI.
- 2.2 General Electric Procedure, FDP-83, "Procedure for Qualification and Certification of Nondestructive Examination Personnel, which meets the requirements of the American Society of Nondestructive Testing (ASNT), Recommended Practice No. SNT-TC-1A, 1975 and 1980 Edition.
- 2.3 American National Standard Institute (ANSI), "Qualification of Personnel," ANSI N45.2.6, 1978 Edition.
- 2.4 United States Nuclear Regulatory Commission (USNRC), I.E. Bulletin Number 88-13, dated May 12, 1980.
- 2.5 USNRC NUREG-0619, "BWR Feedwater Nozzle and CRD Return Line Nozzle Cracking."
- 2.6 USNRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1."
- 2.7 GE Service Information Letter (SIL) Number 289, Core Spray Sparger Visual Inspection, dated February, 1979.
- 2.8 GE SIL Number 409, Incore Dry Tube Cracks, dated July, 1986.
- 2.9 GE SIL Number 420, Inspection of Jet Pump Sensing Line, dated March, 1985.
- 2.10 GE SIL Number 465, Jet Pump Mixer Unusual Surface Observation, dated May, 1988.



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- 2.11 GE SIL Number 474, Steam Dryer Channel Cracking, dated October, 1988.
- 2.12 GE SIL Number 515, Reactor Pressure Vessel Head Linear Indications, dated May 3, 1990.
- 2.13 GE RICSIL Number 050, Reactor Pressure Vessel Head Clad Cracking, dated April 12, 1990.
- 2.14 GE RICSIL Number 054, Core Support Shroud Crack Indications, dated November, 1990.
- 2.15 ASME Code Case N-424, "Qualification of visual examination personnel, Section XI, Division 1."
- 2.16 ASME Code Case 1738, "Examination - Acceptance standards for surface indications in cladding, Section XI."

### 3.0 PERSONNEL

- 3.1 All personnel performing VT-1 visual examinations shall be trained, qualified and certified to at least a VT-1 Level II in accordance with the GE Procedure FQP-03 or equivalent.
- 3.2 All personnel performing VT-3 visual examinations shall be trained, qualified and certified to at least a VT-3 Level II in accordance with the GE Procedure FQP-03 or equivalent.
- 3.3 The visual examiners are required to complete the appropriate data sheets for the examinations that are performed and record the examination results of those examinations.
- 3.4 Personnel performing the visual examination shall additionally be knowledgeable regarding the component being examined and be able to identify deleterious indications relative to that component.
- 3.5 Personnel shall be knowledgeable in the underwater remote visual examination process and equipment. The underwater camera technicians shall be knowledgeable and have experience with the underwater camera equipment. The technicians may be required to demonstrate their proficiency of the underwater camera handling capabilities to the lead visual examiner prior to performing any work over the Reactor Cavity.
- 3.6 All personnel performing examinations per this procedure shall be trained in the handling of Radioactive materials and special precautions necessary when working in a radiation or a radioactively contamination area.

### 4.0 EQUIPMENT

NOTE: Certain equipment is required to perform particular IVVI examinations. The following checklist provides a list of equipment that may be used during particular IVVI examinations:

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- 4.1 Refueling bridge or service platform.
- 4.2 Underwater closed circuit Television Camera System.
  - a) Two (2) Underwater Cameras
  - b) Two (2) Underwater Camera Control Units, backup boards and tubes.
  - c) Two (2) 125 foot cable harness.
  - d) Lighted straight view lens attachment.
  - e) Lighted right angle mirror attachment.
  - f) Two (2) High resolution TV monitors (regular monitors if required)..
- 4.3 An IVVI resolution fixture, holding the 0.001 inch diameter wire and/or a 18X neutral grey card (GE visual comparator card) with a 1/32 inch black line.
- 4.4 Character generator with power supply.
- 4.5 Connecting cables.
- 4.6 Two (2) Microphones.
- 4.7 Video tapes (super or regular VHS) as required.
- 4.8 Float box for a viewing aid.
- 4.9 Work table for electronics.
- 4.10 Two (2) High resolution (super or regular) video tape recorders as required.
- 4.11 General area light(s) (required for resolution).
- 4.12 Local area light(s) (required for resolution).
- 4.13 Nylon rope (250 feet).
- 4.14 Seal handling poles (100 feet).
- 4.15 Seal set of air pliers.
- 4.16 Inspection fixture (optional):
  - a) Core spray sparger inspection fixture.
  - b) Camera holding fixture (general use).
  - c) Dry tube inspection fixture.



d) Steam dryer inspection fixture.

e) Remote operated vehicles.

## 5.0 CALIBRATION

- 5.1 When performing the IVVI of the core spray piping internal brackets, core spray internal piping, core spray spargers and core spray sparger brackets, the IVVI resolution requirements shall be considered adequate and qualified when the combined lighting, access and angle of vision is sufficient to resolve a 0.001 inch diameter wire. This resolution wire may be located in an IVVI resolution fixture.
- 5.2 When performing the IVVI of the remaining components that are listed in this procedure, the IVVI resolution shall be considered adequate and qualified when the combined lighting, access and angle of vision is sufficient to resolve a 1/32 inch black line on a 18% neutral gray card. This resolution standard may be located in an IVVI resolution fixture.
- 5.3 There are no specific VT-3 resolution requirements; however, when performing examinations in accordance with this procedure, the resolution requirements of the VT-3 examinations shall be at least equal to that of a VT-1 resolution as identified in paragraph 5.2.
- 5.4 The IVVI camera resolution shall be performed only once on each major component or every twelve (12) hours or when changes are made to the equipment. The camera to component distance should remain as constant as possible during the examination after the resolution has been verified.

NOTE: IVVI video camera resolution is required on both the live video images as well as the recorded video tape image.

## 6.0 EXAMINATION

### 6.1 Procedure General Requirements

- 6.1.1 Reactor shut down and removable (Reactor Vessel internals) items removed for normal refueling.
- 6.1.2 Reactor cavity water level at the normal full level for IVVI performed from the refuel bridge, or just below the RPV Flange when performing the IVVI from the service platform.
- 6.1.3 Reactor water temperatures should be maintained at less than 90 degrees Fahrenheit and water clarity shall be sufficient for the examiners to view the camera position and to establish the necessary resolution with camera system.



NOTE: The water temperature of 90 degrees Fahrenheit or less is recommended for a higher quality examination. Water temperature affects the examination in several ways:

- a) Temperatures above 140 degrees Fahrenheit and 122 degrees Fahrenheit may adversely affect the B/W (Westinghouse Model ETV-1250) and color camera (Westinghouse Model ETV-1256) heads respectively.
  - b) Thermal distortion (heat waves) of the visual examination begin around 100 degrees Fahrenheit and progressively worsen, at which time the IVVI examination may be impossible to perform.
  - c) Humidity on the refuel floor generally increases with an increase in the water temperature. The Westinghouse ETV-1250 and ETV-1256 Camera Control Units operate with relative humidity in the range from 0 to 95% (non-condensing).
- 6.1.4 Assure the required equipment is available, set up, operationally tested and ready for use during the examination.
- 6.1.5 Reactor water clarity shall be established and judged satisfactory for the examination by the lead GE Level II or Level III examiner.
- 6.1.6 Access for performing visual examination of the dry tubes and control cell components requires the appropriate fuel assemblies to be removed.
- 6.1.7 Access for performing IVVI below the top guide and the core plate requires the appropriate control cells to be disassembled. (ie, removal of the 4 fuel assemblies, control rod drive (CRD), CRD thermal sleeve, placement of a valve flange over the CRD housing flange, fuel support casting, control rod blade and guide tube.
- 6.1.8 All work shall be performed in accordance with the owner's Health Physics Procedures and industrial safety requirements.
- 6.1.9 Ensure that proper health physics coverage is provided during the removal or installation of any items from the RPV.
- 6.1.10 All tools, equipment and materials used in a designated tool control area shall be logged into and out of the area. Tools and associated equipment to be used over the reactor cavity or RPV shall be tied off to prevent anything dropping into the RPV. Specific requirements for such control are beyond the scope of this procedure, but must be consistent with owner's requirements and/or procedures.
- 6.1.11 Prior to examination, all parts of the invessel camera or manipulator(s) (nuts, bolts, etc.) shall be captured or properly retained to prevent loss in the Reactor Vessel.



- 6.1.12 The examination shall be recorded on video tape with voice recording and character generator, unless otherwise indicated by owner.
- 6.1.13 Where required, particular attention shall be given to each welded joint and the heat affected zone (HAZ) associated with each welded joint.
- 6.1.14 When using optical aids to improve the angle of vision and/or resolution, care must be taken to ensure that the equipment does not shadow the area of interest or otherwise mask the examination area.
- 6.1.15 The video tape recorded during the examination should be reviewed by an independent Level II or Level III IVVI Visual Examiner. Timely review of those tapes could resolve any questions prior to IVVI equipment being disassembled or removed from the area of examination.
- 6.1.16 All areas and components examined by the remote underwater television system shall have the system qualified by verifying the IVVI resolution requirements appropriate to the examination being performed, per paragraph 5.8.

## 6.2 Remote Television Techniques - IVVI

- 6.2.1 When a video recorder is used during the examination, do not run the recorder constantly. Achieve the best resolution and focus possible. When the examiner is satisfied with the picture, begin the recording. Record still images for about 20 seconds. During scans, continue to record at the end of the scan for about 20 seconds. At the end of an image recording, press the pause button on the recorder. This will provide for a smooth transition from one image to another without loss of any previously taped images. Additionally, it will eliminate excessive reviewing and editing time.
- 6.2.2 Perform a visual scan of components by moving the television camera slowly across the component surface, pausing at each weld so that the examiner can verify whether or not flaw indications are present.

## 6.3 Examiner's Duties

- 6.3.1 Examiners shall sign off the invessel visual examination data sheet(s) as required (See Exhibit II and III).
- 6.3.2 Review the video tape as each component is examined and check the tape for quality, completeness and accuracy. Fill in the appropriate information on the invessel visual examination data sheet (s). (See Exhibit II and III).



6.3.3 Using the underwater television system and adequate lighting, examine those areas as outlined in the procedure for conditions listed on each component. Any abnormalities should be documented with video recording and appropriate supplemental documentation shall be attached to the data package. (See Exhibit II and III).

6.4 ASME Code Requirements - IVVI

6.4.1 ASME Section XI Code, Subsection IWA-2211 Visual Examination VT-1:

- a) The VT-1 visual examination shall be conducted to determine the condition of the part, component, or surface examined, including such conditions as cracks, wear, corrosion, erosion or physical damage on the surface of the part or component.
- b) Direct visual examination may be conducted when access is sufficient to place the eye within 24 inches (61 cm) of the surface to be examined and at an angle not less than 30 degrees to the surface. Mirrors may be used to improve the angle of vision and aids such as a magnifying lens may be used to assist examinations. The specific part, component, or section thereof, under immediate examination, shall be illuminated, as necessary, with a flashlight or other auxiliary lighting, to attain a minimum of 15 foot candles (fc) for general examination and a minimum of 50 fc for the detection or study of small indications. In addition, illumination of the area to be examined may be required at right or oblique angles to expose cracks or evidence of corrosion or erosion. Resolution shall be considered adequate and qualified when the combined lighting, access and angle of vision is sufficient to resolve a 1/32 inch black line on a 18X neutral gray (GE visual comparator) card.
- c) Remote visual examination may be performed where conditions exist that prevent direct visual examination. Remote visual examination may include visual aids such as telescopes, periscopes, binoculars, fiber optics, television cameras and monitoring systems or other suitable instruments. Remote techniques shall demonstrate the ability to provide a resolution at least equivalent to that obtained by direct visual examination. Mirrors, moveable lights, rotating optics or any combination thereof may be utilized to display cracks, surface scratches, or evidence of corrosion, erosion, misalignment or movement. In the event remote visual examination is required utilizing remote equipment, evaluations shall be performed by personnel with experience in the method selected.





6.4.2 ASME Section XI Code, Subsection IWA-2213 Visual Examination VT-3:

- a) The visual examination shall be conducted to determine the general mechanical and structural condition of components and their supports, such as the presence of loose parts, debris, or abnormal corrosion products, wear, erosion, corrosion and the loss of integrity at bolted or welded connections.
- b) The VT-3 visual examination may require, as applicable to determine structural integrity, the measurement of clearances, detection of physical displacement, structural adequacy of supporting elements, connection between load carrying structural members and tightness of bolting.

6.4.3 For component supports and component interiors, the visual examinations may be performed remotely with or without optical aids to verify the structural integrity of the component.

6.5 Examination Areas - General

6.5.1 The following components, when required to be examined using this procedure, shall be examined per the methods indicated and the results of the IVVI examination noted on the data sheets.

6.5.2 Visual examinations are required to be performed on the accessible areas which are defined as the space above and below the Reactor Core that is made accessible for examinations by removal of components during normal refueling outages.

6.6 Above Core Plate Examination (ACPE) General

6.6.1 The steam dryer hold down lugs and the top head examinations should be performed by the direct visual method.

6.6.2 The shroud, shroud support welds, jet pump diffuser welds, jet pump sensing line brackets and the access cover welds should be inspected during the jet pump assembly examination. It will be difficult to view any large areas within the shroud and vessel wall due to limited accessibility.

6.6.3 The examination of the steam dryer and separator are performed while in the flooded equipment storage pool. This will require some form of access for the camera holders from above, such as the refueling bridge.

6.6.4 The following components shall be examined in accordance with the ISI Program or outage workscope and the following conditions recorded as a minimum on the applicable data sheet:

6.7 Cladding Patches - ACPE (if required)

6.7.1 Condition of cladding patches.



6.7.2 Note general condition of cladding observed.

6.8 Guide Rod - ACPE

6.8.1 Condition of bracket to vessel wall weld.

6.8.2 General condition of upper guide rod bracket.

6.8.3 Condition of plug weld.

6.8.4 General condition of guide rod including the lower plug and bracket attachment to the shroud.

6.8.5 Record the guide rod azimuth examined.

6.9 Steam Dryer Support Bracket - ACPE

6.9.1 Condition of bracket to vessel wall weld.

6.9.2 Condition of dryer seating surface for wear.

6.9.3 Record the steam dryer support brackets examined.

6.10 Steam Dryer Hold Down Bracket - ACPE

6.10.1 Condition of dryer hold down brackets.

6.10.2 Condition of the seating surface.

6.10.3 Condition of the attachment weld to the RPV head.

6.10.4 Record the steam dryer hold down bracket azimuth examined.

NOTE: This inspection is performed using direct visual techniques while the RPV head is on its storage pedestals.

6.11 Reactor Pressure Vessel Head - ACPE

6.11.1 General Condition of the inside surface adjacent to the top head vertical and horizontal pressure vessel welds (clad or unclad).

6.11.2 Record the location of the head weld examined.

NOTE: This inspection is performed using direct visual techniques while the RPV head is on its storage pedestals.

6.12 Feedwater Sparger End Bracket - ACPE

6.12.1 Condition of bracket to vessel wall weld.

6.12.2 General condition of bracket.

6.12.3 Record the feedwater sparger end bracket azimuth examined.



6.13 Feedwater Sparger - ACPE

- 6.13.1 General condition of feedwater sparger.
- 6.13.2 Condition of sparger welds.
- 6.13.3 Condition of nozzle welds or flow holes as applicable.
- 6.13.4 Condition of end bracket pins and tack welds.
- 6.13.5 Condition of end bracket welds
- 6.13.6 Record the Feedwater Sparger azimuth examined.

6.14 Feedwater Nozzle - ACPE

- 6.14.1 Condition of the nozzle inner radius accessible areas.
- 6.14.2 Condition of nozzle bore accessible areas.
- 6.14.3 Record the Feedwater Nozzle azimuth examined.

6.15 Core Spray Internal Piping Wall Bracket - ACPE

- 6.15.1 Condition of bracket to vessel wall welds.
- 6.15.2 Condition of the bolt head tack welds.
- 6.15.3 General condition of the bracket.
- 6.15.4. Record the core spray internal piping wall brackets examined.

6.16 Core Spray Internal Piping - ACPE

- 6.16.1 General condition of core spray header piping.
- 6.16.2 Condition of core spray header welds.
- 6.16.3 General condition of core spray downcomer piping.
- 6.16.4 Condition of core spray downcomer welds.
- 6.16.5 Condition of elbow welds.
- 6.16.6 Condition of junction (tee) box welds with particular attention to the heat affected zone of the flow divider welds.
- 6.16.7 condition of junction (tee) box to thermal sleeve area.
- 6.16.8 Record the azimuth or loop examined.



6.17 Core Spray Sparger - ACPE

6.17.1 Examine the four core spray spargers in at least four camera passes for the following:

- a) One pass concentrating on the upper sparger tack welds and nozzle conditions.
- b) One pass concentrating on the lower sparger tack welds and nozzle conditions.
- c) Two passes of different angles covering as much of the sparger pipe surface as possible including the tee welds.
- d) The examination should concentrate for cracks in the welds and the weld heat affected zones. Cracks have also been found in the sparger piping.
- e) Condition of the sparger supported brackets to sparger and top guide.

6.17.2 Record the areas examined.

6.18 Jet Pump Assembly - ACPE

6.18.1 Condition of beam bolt keeper and tack welds.

6.18.2 Condition of lock plate, flat head screws and tack welds.

6.18.3 Alignment and condition of hold down beam.

6.18.4 Condition of beam retainer.

6.18.5 Seating of ram head, nozzles and condition of inlet suction area.

6.18.6 Condition of riser brace and attachment weld to vessel wall

6.18.7 Condition of riser brace to riser weld.

6.18.8 Condition of wedge assembly.

6.18.9 Condition of the restrainer bracket, set screws and tack welds.

6.18.10 Condition of slip joint.

6.18.11 Condition of diffuser to adapter weld.

6.18.12 Condition of diffuser weld to shroud plate.

6.18.13 Record the jet pump assembly examined.



6.19 Jet Pump Sensing Line - ACPE

- 6.19.1 Condition of sensing line attachment welds to brackets.
- 6.19.2 Condition of bracket weld to diffuser.
- 6.19.3 Condition of the sensing line coupling welds.
- 6.19.4 Record the jet pump sensing line examined.

6.20 Shroud Support Plate Weld - ACPE

- 6.20.1 Condition of accessible shroud support plate weld to reactor vessel wall.
- 6.20.2 Condition of accessible shroud support plate weld to shroud.
- 6.20.3 Condition of accessible shroud stiffer welds (if applicable).
- 6.20.4 Record the section of shroud support plate weld examined.

6.21 Shroud - ACPE

- 6.21.1 General condition of the shroud/separator flange mating surface.
- 6.21.2 Record the section of the shroud/separator flange mating surface examined.
- 6.21.3 Condition of the inside surface accessible portion of the circumferential weld in the main cylinder section of the shroud. This weld is located between the core plate and the top guide (see Figure 1).
- 6.21.4 If indications are identified during the examination as required in paragraph 6.21.3, examine the outside area of the shroud weld that contains the suspect indications.
- 6.21.5 Record the section of the shroud circumferential weld examined.
- 6.21.6 Condition of the inside surface accessible portion of the two vertical welds in the main cylinder section, upper portion of the shroud (see Figure 1).
- 6.21.7 Condition of the inside surface accessible portion of the two vertical welds in the main cylinder section, lower portion of the shroud (see Figure 1).
- 6.21.8 If indications are identified during the examination as required in paragraph 6.21.5 and 6.21.6, examine the outside area of the shroud weld that contains the suspect indications.
- 6.21.9 Record the section of the shroud vertical welds examined.





6.21.9 If during the examinations of paragraphs 6.21.3, 6.21.6 or 6.21.7 indications are identified, other shroud welds may be required to be examined by the owner. Record these additional shroud welds examined.

6.22 Shroud Support Access Cover - ACPE

6.22.1 Condition of the shroud access cover weld to shroud support plate.

6.22.2 General condition of the access cover.

6.22.3 Record the azimuth of the access cover examined.

6.23 Instrument Dry Tube - ACPE

6.23.1 Condition of the upper two (2) feet of the dry tube.

6.23.2 Check for cracks in the spring housing.

6.23.3 Record the X-Y coordinates of the dry tubes examined.

NOTE: The four (4) fuel assemblies surrounding the dry tube should be removed to allow camera access. Be careful not to bump the dry tube. Inspect dry tubes from all four (4) directions (if accessible).

6.24 Surveillance Sample Holder - ACPE

6.24.1 Condition of the upper mounting bracket and weld.

6.24.2 Condition of the lower mounting bracket and weld.

6.24.3 General condition of the sample holder.

6.24.4 Record the sample holder examined.

6.25 Control Rod Drive Nozzle - ACPE

6.25.1 Condition of the nozzle inner radius area.

6.25.2 Record the azimuth of the CRD nozzle examined.

6.26 Top Guide Hold Downs - ACPE

6.26.1 Condition of bolt, keeper, wedge and tack welds.

6.26.2 Examine one pass around peripheral top guide and 2 center fuel cells and all 4 corners of each cell.

6.26.3 Record the location of the area examined.

6.27 Steam Dryer - ACPE

6.27.1 General condition of the lifting eye assemblies.



- 6.27.2 Condition of the attachment welds to the lifting eye and the dryer wall.
- 6.27.3 Condition of the bank vertical welds.
- 6.27.4 Condition of the seal horizontal welds between the vertical welds near the bottom of the vertical welds and top of the upper support ring.
- 6.27.5 Condition of the upper and lower plugs in the bank area between the bank vertical welds (if required).
- 6.27.6 Condition of the bank horizontal welds.
- 6.27.7 Condition of the bank tie bar welds.
- 6.27.8 Condition of the manway cover weld.
- 6.27.9 Condition of the seal to bank weld.
- 6.27.10 Condition of the upper support ring to the seal weld.
- 6.27.11 Condition of the support lugs adjacent on the upper support ring..
- 6.27.12 Condition of the upper support ring consternating on the upper 2" looking for horizontal indications.
- 6.27.13 Condition of the upper support ring to the skirt weld.
- 6.27.14 Condition of the drain channel welds consternating on the bottom 2" of the vertical welds.
- 6.27.15 Condition of the skirt to skirt horizontal weld.
- 6.27.16 Condition of the lower support ring to skirt weld.
- 6.27.17 Condition of the upper and lower guides and welds.
- 6.27.18 Record the azimuth or location of the dryer that was examined.
- 6.28 Steam Separator - ACPE
  - 6.28.1 General condition of separator.
  - 6.28.2 Condition of lifting eye assemblies.
  - 6.28.3 Condition of outer peripheral (top and bottom) standpipes and welds.
  - 6.28.4 Record the area examined.



6.29 Steam Separator Shroud Head Bolt - ACPE

- 6.29.1 Condition of the shroud head bolt.
- 6.29.2 Condition of the locking collar assembly for wear.
- 6.29.3 Record the number of bolts examined.

6.30 Below Core Plate Examination (BCPE) - GENERAL:

- 6.30.1 The IVVI examination is required when the components are made accessible during the normal refueling outage activities. Access for performing IVVI below the core plate requires the appropriate control cells to be disassembled, (ie, removal of the 4 fuel assemblies, support casting, control rod guide tube, CRD, unlatching of the CRD thermal sleeve and the placement of a valved flange over the CRD housing flange.).

6.31 Fuel Support Casting - BCPE

- 6.31.1 Condition of the tack welds securing the flow orifices.
- 6.31.2 General condition of the casting.
- 6.31.3 Check for proper seating in the guide tube.
- 6.31.4 Check the alignment pin in the core plate for excessive bending.
- 6.31.5 Condition of lower tie plate seating area in fuel support casting.
- 6.31.6 Record the location of the castings examined.

6.32 Control Rod Guide Tube - BCPE

- 6.32.1 General condition of guide tubes.
- 6.32.2 Check for debris inside the guide tube.
- 6.32.3 Condition of the spud fingers and pin located at the top of the CRD housing, inside of the control rod guide tube.
- 6.32.4 Check for proper seating of the guide tube.
- 6.32.5 Condition of guide tube seating surface when it contacts core plate.
- 6.32.6 Record the location of the guide tube examined.

6.33 Control Rod Drive Housing - BCPE

- 6.33.1 Condition of the weld between the CRD stub tube and the vessel bottom head.



- 6.33.2 Condition of the weld between the CRD housing and the stub tube.
- 6.33.3 General condition of the CRD housing.
- 6.33.4 Check for debris around the CRD housing.
- 6.33.5 Record the X-Y coordinates of the CRD's examined.

6.34 In-Core Guide Tube - BCPE

- 6.34.1 Condition of the weld between the in-core and the vessel bottom head.
- 6.34.2 Check the weld joining the in-core guide tube to the in-core housing.
- 6.34.3 General condition of the in-core guide tube.
- 6.34.4 Condition of the stabilizers.
- 6.34.5 Check for debris around the in-core guide tubes.
- 6.34.6 Record the X-Y coordinate of the in-core guide tube.

6.35 Standby Liquid Control Piping and RPV Differential Pressure Instrument Piping - BCPE

- 6.35.1 Condition of the weld between the pipe and the vessel wall.
- 6.35.2 Condition of the SLC support bracket welds.
- 6.35.3 General condition of the SLC piping.
- 6.35.4 Condition of the DPI support bracket welds.
- 6.35.5 General condition of the DPI piping.
- 6.35.6 Record the SLC or DPI piping examined.

6.36 Bottom Head Drain - BCPE -

- 6.36.1 General condition of the drain line openings.
- 6.36.2 Check for debris around drain line opening.
- 6.36.3 Record the bottom head drain examined.

6.37 Core Plate Support - BCPE

- 6.37.1 Condition of the fillet welds between the core plate and the support beams.

- 6.37.2 Record the section of core plate supports that are examined



6.38 Shroud Support Pillars - BCPE (if applicable)

- 6.38.1 Condition of support pillar to lower vessel head weld;
- 6.38.2 Condition of support pillar to shroud weld.
- 6.38.3 Check for debris and pillar erosion.
- 6.38.4 Record the shroud support pillars examined.

6.39 Completion of Examination

- 6.39.1 Remove all inspection equipment from the reactor pressure vessel and clean up the area.
- 6.39.2 View and edit examination video tapes.
- 6.39.3 Complete all of the examination data sheets.
- 6.39.4 Verify no lost parts from the inventory list.

7.0 RECORDING

- 7.1 The visual examiner shall be responsible for recording of examination results that provide a basis for evaluation and facilitate comparison with the results of subsequent examinations.
- 7.2 The following relevant conditions must be reported as a sinisus to the Owner as unacceptable.
  - 7.2.1 Structural distortion or displacement of parts to the extent the component function may be impaired.
  - 7.2.2 Loose, missing, cracked, or fractured parts, bolting or fasteners.





- 7.2.3 Foreign materials or accumulation of corrosion products that could interfere with control rod motion or could result in blockage of coolant flow through the fuel.
  - 7.2.4 Corrosion or erosion that reduces the nominal section thickness by more than 5%.
  - 7.2.5 Wear of mating surfaces that may lead to loss of function.
  - 7.2.6 Structural degradation of interior attachments such that the original cross sectional area is reduced more than 5%.
  - 7.2.7 The components previous VT examination results shall be reviewed to verify that indications have not changed. If indications have changed, the visual examiner shall insure that the change is identified on the Examination Summary Sheet (Exhibit I).
- 7.3 Abnormalities detected shall be documented with sketches, photographs or other forms which will aid in the evaluation process.

#### 8.0 EVALUATION

- 8.1 Components where examination either reveals indications that are in excess of the Owner's specification(s) or previously recorded indications that are significant larger than recorded shall be unacceptable for service. If Owner's specification is not provided, Paragraph 7.2 shall apply.
- 8.2 Visual examinations that detect surface flaws where practical, should be supplemented by either surface or volumetric examinations to determine the character of the flaw (size, shape and orientation).
- 8.3 The Lead Visual Examiner shall evaluate examination results to the inspection criteria specified in the Evaluation Section. The video tapes and recorded examination results shall be reviewed and evaluated by at least a Level II independent reviewer other than the examiners that performed the examination. This evaluation shall be documented on the Examination Summary Sheet (See Exhibit I).



8.4 The lead visual IVVI examiner shall notify the Owner's representative of any defects that will require additional engineering evaluation or any abnormalities that are unacceptable within 1 hour after the completion of the evaluation process.

#### 9.0 REPORTS

9.1 The examination results shall be recorded on the Invesel Visual Examination Data Sheets (See Exhibit II and III). Alternative data sheets may be used if the minisue information is recorded in accordance with the procedure requirements. After the IVVI examination is completed, the Examination Summary Sheet (Exhibit I) shall be filled out summarizing the examination that was performed.

9.2 The Invesel Visual Examination Data Sheets shall be prepared for all components examined. The format of the data sheet exhibits are subject to change as may be required. The Visual Examination Data Sheet shall include the following information as a minisue:

- a) Visual Examiner(s) signature(s) and level(s)
- b) Date of Examination
- c) Procedure Number, Revision Number, Field Revision Request Number
- d) Type of visual examination (direct/remote)
- e) Illumination Used, if any
- f) Direct Visual Aids Used, if any
- g) Remote Visual Equipment Used, if any
- h) Identification of Components Examined
- i) Examination Results
- j) Location and Size of any indications

9.3 Should Owner request a report in addition to the Examination Summary Sheet and the Invesel Visual Examination Data Sheets, the report should be prepared and submitted to the Owner as specified by the contract.

BOSTON EDISON

PILGRIM NUCLEAR POWER STATION

Temporary Procedure No. TP91-080

INVESSEL VISUAL INSPECTION (IVVI) PROCEDURE FOR  
BWR-3 REACTOR PRESSURE VESSEL INTERNALS

<del>WORKING COPY</del>	
ISSUED	OCT 1 1991
<small>(NOTES LISTED CHECK FOR EXEMPTION NOTICE PERSONNEL ACTION)</small>	

REVIEWERS AND APPROVERS

<i>John Hunter</i> Procedure Writer	5/6/91 Date
<i>B Perkins</i> Technical Reviewer	5/7/91 Date
<i>Charles Gannon</i> Validator	5/7/91 Date
<i>C. J. Muto</i> Procedure Owner	5/8/91 Date
<i>Exempt per BEQAM 5.2.5</i> QAD Manager	5/7/91 Date
<i>NOT REQ JAS</i> ORC Chairman	5-10-91 Date
<i>D. Eng</i> Planning & Outage Manager	5-13-91 Date

QC REVIEW REQUIRED

~~QA PROGRAM RELATED~~ *jc*

SAFETY REVIEW ~~REQUIRED~~  
NOT REQUIRED

ORC REVIEW ~~REQUIRED~~  
NOT REQUIRED

Effective Date: 5-14-91

Expiration Date: 11-10-91



## GE Nuclear Energy

PROCEDURE NO.: GE-VT-204

TITLE

REVISION NO.: 0

INVESSEL VISUAL INSPECTION (IVVI) PROCEDURE FOR  
BWR-3 REACTOR PRESSURE VESSEL INTERNALS

PREPARED BY:

DATE: 4/6/91 GE LEVEL: III

REVIEWED BY:

DATE: APRIL 10, 1991 GE LEVEL: III

APPROVED FOR USE BY:

DATE: APRIL 10, 1991

COMMENTS:

FORM 15.1 4-08-90



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## 1.0 SCOPE

- 1.1 This procedure defines the method and requirements for VT-1 and VT-3, Invesel Visual Inspection (IVVI) of the Reactor Pressure Vessel (RPV), General Electric Boiling Water Reactor (BWR), type THREE (3) internals which are made accessible during scheduled refueling and maintenance outages. This procedure meets the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Code, Table IWB-2500, Examination Categories B-N-1 and B-N-2. Augmented inspection requirements are also defined in this procedure.
- 1.2 This procedure can be utilized in its entirety or portions thereof, as directed by the Inservice Inspection (ISI) Program or the specified outage workscope. The inspections can be conducted in any order so as to allow for increase in production or to support other operations during refueling and maintenance outages.

## 2.0 REFERENCES

- 2.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section V and XI.
- 2.2 General Electric Procedure, FQP-03, "Procedure for Qualification and Certification of Nondestructive Examination Personnel, which meets the requirements of the American Society of Nondestructive Testing (ASNT), Recommended Practice No. SNT-TC-1A, 1975 and 1980 Edition.
- 2.3 American National Standard Institute (ANSI), "Qualification of Personnel," ANSI N45.2.6, 1978 Edition.
- 2.4 United States Nuclear Regulatory Commission (USNRC), I.E. Bulletin Number 80-13, dated May 12, 1980.
- 2.5 USNRC NUREG-0419, "BWR Feedwater Nozzle and CRD Return Line Nozzle Cracking."
- 2.6 USNRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1."
- 2.7 GE Service Information Letter (SIL) Number 289, Core Spray Sparger Visual Inspection, dated February, 1979.
- 2.8 GE SIL Number 409, Incore Dry Tube Cracks, dated July, 1986.
- 2.9 GE SIL Number 420, Inspection of Jet Pump Sensing Line, dated March, 1985.
- 2.10 GE SIL Number 465, Jet Pump Mixer Unusual Surface Observation, dated May, 1988.



- 2.11 GE SIL Number 474, Steam Dryer Channel Cracking, dated October, 1988.
- 2.12 GE SIL Number 515, Reactor Pressure Vessel Head Linear Indications, dated May 3, 1990.
- 2.13 GE RICSIL Number 850, Reactor Pressure Vessel Head Clad Cracking, dated April 12, 1990.
- 2.14 GE RICSIL Number 854, Core Support Shroud Crack Indications, dated November, 1990.
- 2.15 ASME Code Case N-424, "Qualification of visual examination personnel, Section XI, Division 1."
- 2.16 ASME Code Case 1738, "Examination - Acceptance standards for surface indications in cladding, Section XI."

### 3.0 PERSONNEL

- 3.1 All personnel performing VT-1 visual examinations shall be trained, qualified and certified to at least a VT-1 Level II in accordance with the GE Procedure FQP-03 or equivalent.
- 3.2 All personnel performing VT-3 visual examinations shall be trained, qualified and certified to at least a VT-3 Level II in accordance with the GE Procedure FQP-03 or equivalent.
- 3.3 The visual examiners are required to complete the appropriate data sheets for the examinations that are performed and record the examination results of those examinations.
- 3.4 Personnel performing the visual examination shall additionally be knowledgeable regarding the component being examined and be able to identify deleterious indications relative to that component.
- 3.5 Personnel shall be knowledgeable in the underwater remote visual examination process and equipment. The underwater camera technicians shall be knowledgeable and have experience with the underwater camera equipment. The technicians may be required to demonstrate their proficiency of the underwater camera handling capabilities to the lead visual examiner prior to performing any work over the Reactor Cavity.
- 3.6 All personnel performing examinations per this procedure shall be trained in the handling of Radioactive materials and special precautions necessary when working in a radiation or a radioactively contamination area.

### 4.0 EQUIPMENT

NOTE: Certain equipment is required to perform particular IVVI examinations. The following checklist provides a list of equipment that may be used during particular IVVI examinations:



- 4.1 Refueling bridge or service platform.
- 4.2 Underwater closed circuit Television Camera System.
  - a) Two (2) Underwater Cameras
  - b) Two (2) Underwater Camera Control Units, backup boards and tubes.
  - c) Two (2) 125 foot cable harness.
  - d) Lighted straight view lens attachment.
  - e) Lighted right angle mirror attachment.
  - f) Two (2) High resolution TV monitors (regular monitors if required)..
- 4.3 An IVVI resolution fixture, holding the 0.001 inch diameter wire and/or a 18% neutral grey card (GE visual comparator card) with a 1/32 inch black line.
- 4.4 Character generator with power supply.
- 4.5 Connecting cables.
- 4.6 Two (2) Microphones.
- 4.7 Video tapes (super or regular VHS) as required.
- 4.8 Float box for a viewing aid.
- 4.9 Work table for electronics.
- 4.10 Two (2) High resolution (super or regular) video tape recorders as required.
- 4.11 General area light(s) (required for resolution).
- 4.12 Local area light(s) (required for resolution).
- 4.13 Nylon rope (250 feet).
- 4.14 Small handling poles (100 feet).
- 4.15 Small set of air pliers.
- 4.16 Inspection fixture (optional):
  - a) Core spray sparger inspection fixture.
  - b) Camera holding fixture (general use).
  - c) Dry tube inspection fixture.



d) Steam dryer inspection fixture.

e) Remote operated vehicles.

## 5.0 CALIBRATION

- 5.1 When performing the IVVI of the core spray piping internal brackets, core spray internal piping, core spray spargers and core spray sparger brackets, the IVVI resolution requirements shall be considered adequate and qualified when the combined lighting, access and angle of vision is sufficient to resolve a 0.001 inch diameter wire. This resolution wire may be located in an IVVI resolution fixture.
- 5.2 When performing the IVVI of the remaining components that are listed in this procedure, the IVVI resolution shall be considered adequate and qualified when the combined lighting, access and angle of vision is sufficient to resolve a 1/32 inch black line on a 18X neutral gray card. This resolution standard may be located in an IVVI resolution fixture.
- 5.3 There are no specific VT-3 resolution requirements; however, when performing examinations in accordance with this procedure, the resolution requirements of the VT-3 examinations shall be at least equal to that of a VT-1 resolution as identified in paragraph 5.2.
- 5.4 The IVVI camera resolution shall be performed only once on each major component or every twelve (12) hours or when changes are made to the equipment. The camera to component distance should remain as constant as possible during the examination after the resolution has been verified.

NOTE: IVVI video camera resolution is required on both the live video images as well as the recorded video tape image.

## 6.0 EXAMINATION

### 6.1 Procedure General Requirements

- 6.1.1 Reactor shut down and removable (Reactor Vessel internals) items removed for normal refueling.
- 6.1.2 Reactor cavity water level at the normal full level for IVVI performed from the refuel bridge, or just below the RPV Flange when performing the IVVI from the service platform.
- 6.1.3 Reactor water temperatures should be maintained at less than 90 degrees Fahrenheit and water clarity shall be sufficient for the examiners to view the camera position and to establish the necessary resolution with camera system.





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NOTE: The water temperature of 90 degrees Fahrenheit or less is recommended for a higher quality examination. Water temperature affects the examination in several ways:

- a) Temperatures above 140 degrees Fahrenheit and 122 degrees Fahrenheit may adversely affect the B/W (Westinghouse Model ETV-1250) and color camera (Westinghouse Model ETV-1256) heads respectively.
- b) Thermal distortion (heat waves) of the visual examination begin around 100 degrees Fahrenheit and progressively worsen, at which time the IUVI examination may be impossible to perform.
- c) Humidity on the refuel floor generally increases with an increase in the water temperature. The Westinghouse ETV-1250 and ETV-1256 Camera Control Units operate with relative humidity in the range from 0 to 95% (non-condensing).

- 6.1.4 Assure the required equipment is available, set up, operationally tested and ready for use during the examination.
- 6.1.5 Reactor water clarity shall be established and judged satisfactory for the examination by the lead GE Level II or Level III examiner.
- 6.1.6 Access for performing visual examination of the dry tubes and control cell components requires the appropriate fuel assemblies to be removed.
- 6.1.7 Access for performing IUVI below the top guide and the core plate requires the appropriate control cells to be disassembled. (ie, removal of the 4 fuel assemblies, control rod drive (CRD), CRD thermal sleeve, placement of a valve flange over the CRD housing flange, fuel support casting, control rod blade and guide tube.
- 6.1.8 All work shall be performed in accordance with the owner's Health Physics Procedures and industrial safety requirements.
- 6.1.9 Ensure that proper health physics coverage is provided during the removal or installation of any items from the RPV.
- 6.1.10 All tools, equipment and materials used in a designated tool control area shall be logged into and out of the area. Tools and associated equipment to be used over the reactor cavity or RPV shall be tied off to prevent anything dropping into the RPV. Specific requirements for such control are beyond the scope of this procedure, but must be consistent with owner's requirements and/or procedures.
- 6.1.11 Prior to examination, all parts of the invessel camera or manipulator(s) (nuts, bolts, etc.) shall be captured or properly retained to prevent loss in the Reactor Vessel.





- 6.1.12 The examination shall be recorded on video tape with voice recording and character generator, unless otherwise indicated by owner.
- 6.1.13 Where required, particular attention shall be given to each welded joint and the heat affected zone (HAZ) associated with each welded joint.
- 6.1.14 When using optical aids to improve the angle of vision and/or resolution, care must be taken to ensure that the equipment does not shadow the area of interest or otherwise mask the examination area.
- 6.1.15 The video tape recorded during the examination should be reviewed by an independent Level II or Level III IVVI Visual Examiner. Timely review of those tapes could resolve any questions prior to IVVI equipment being disassembled or removed from the area of examination.
- 6.1.16 All areas and components examined by the remote underwater television system shall have the system qualified by verifying the IVVI resolution requirements appropriate to the examination being performed, per paragraph 5.0.
- 6.2 Remote Television Techniques - IVVI
- 6.2.1 When a video recorder is used during the examination, do not run the recorder constantly. Achieve the best resolution and focus possible. When the examiner is satisfied with the picture, begin the recording. Record still images for about 20 seconds. During scans, continue to record at the end of the scan for about 20 seconds. At the end of an image recording, press the pause button on the recorder. This will provide for a smooth transition from one image to another without loss of any previously taped images. Additionally, it will eliminate excessive reviewing and editing time.
- 6.2.2 Perform a visual scan of components by moving the television camera slowly across the component surface, pausing at each weld so that the examiner can verify whether or not flaw indications are present.
- 6.3 Examiner's Duties
- 6.3.1 Examiners shall sign off the invessel visual examination data sheet(s) as required (See Exhibit II and III).
- 6.3.2 Review the video tape as each component is examined and check the tape for quality, completeness and accuracy. Fill in the appropriate information on the invessel visual examination data sheet (s). (See Exhibit II and III).



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6.3.3 Using the underwater television system and adequate lighting, examine those areas as outlined in the procedure for conditions listed on each component. Any abnormalities should be documented with video recording and appropriate supplemental documentation shall be attached to the data package. (See Exhibit II and III).

#### 6.4 ASME Code Requirements - IVVI

##### 6.4.1 ASME Section XI Code, Subsection IWA-2211 Visual Examination VT-1:

- a) The VT-1 visual examination shall be conducted to determine the condition of the part, component, or surface examined, including such conditions as cracks, wear, corrosion, erosion or physical damage on the surface of the part or component.
- b) Direct visual examination may be conducted when access is sufficient to place the eye within 24 inches (61 cm) of the surface to be examined and at an angle not less than 30 degrees to the surface. Mirrors may be used to improve the angle of vision and aids such as a magnifying lens may be used to assist examinations. The specific part, component, or section thereof, under immediate examination, shall be illuminated, as necessary, with a flashlight or other auxiliary lighting, to attain a minimum of 15 foot candles (fc) for general examination and a minimum of 50 fc for the detection or study of small indications. In addition, illumination of the area to be examined may be required at right or oblique angles to expose cracks or evidence of corrosion or erosion. Resolution shall be considered adequate and qualified when the combined lighting, access and angle of vision is sufficient to resolve a 1/32 inch black line on a 18X neutral gray (GE visual comparator) card.
- c) Remote visual examination may be performed where conditions exist that prevent direct visual examination. Remote visual examination may include visual aids such as telescopes, periscopes, binoculars, fiber optics, television cameras and monitoring systems or other suitable instruments. Remote techniques shall demonstrate the ability to provide a resolution at least equivalent to that obtained by direct visual examination. Mirrors, moveable lights, rotating optics or any combination thereof may be utilized to display cracks, surface scratches, or evidence of corrosion, erosion, misalignment or movement. In the event remote visual examination is required utilizing remote equipment, evaluations shall be performed by personnel with experience in the method selected.



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#### 6.4.2 ASME Section XI Code, Subsection IWA-2213 Visual Examination VT-3:

- a) The visual examination shall be conducted to determine the general mechanical and structural condition of components and their supports, such as the presence of loose parts, debris, or abnormal corrosion products, wear, erosion, corrosion and the loss of integrity at bolted or welded connections.
- b) The VT-3 visual examination may require, as applicable to determine structural integrity, the measurement of clearances, detection of physical displacement, structural adequacy of supporting elements, connection between load carrying structural members and tightness of bolting.

6.4.3 For component supports and component interiors, the visual examinations may be performed remotely with or without optical aids to verify the structural integrity of the component.

#### 6.5 Examination Areas - General

- 6.5.1 The following components, when required to be examined using this procedure, shall be examined per the methods indicated and the results of the IVVI examination noted on the data sheets.
- 6.5.2 Visual examinations are required to be performed on the accessible areas which are defined as the space above and below the Reactor Core that is made accessible for examinations by removal of components during normal refueling outages.

#### 6.6 Above Core Plate Examination (ACPE) General

- 6.6.1 The steam dryer hold down lugs and the top head examinations should be performed by the direct visual method.
- 6.6.2 The shroud, shroud support welds, jet pump diffuser welds, jet pump sensing line brackets and the access cover welds should be inspected during the jet pump assembly examination. It will be difficult to view any large areas within the shroud and vessel wall due to limited accessibility.
- 6.6.3 The examination of the steam dryer and separator are performed while in the flooded equipment storage pool. This will require some form of access for the camera holders from above, such as the refueling bridge.
- 6.6.4 The following components shall be examined in accordance with the ISI Program or outage workscope and the following conditions recorded as a minimum on the applicable data sheet:

#### 6.7 Cladding Patches - ACPE (if required)

- 6.7.1 Condition of cladding patches.



6.7.2 Note general condition of cladding observed.

6.8 Guide Rod - ACPE

6.8.1 Condition of bracket to vessel wall weld.

6.8.2 General condition of upper guide rod bracket.

6.8.3 Condition of plug weld.

6.8.4 General condition of guide rod including the lower plug and bracket attachment to the shroud.

6.8.5 Record the guide rod azimuth examined.

6.9 Steam Dryer Support Bracket - ACPE

6.9.1 Condition of bracket to vessel wall weld.

6.9.2 Condition of dryer seating surface for wear.

6.9.3 Record the steam dryer support brackets examined.

6.10 Steam Dryer Hold Down Bracket - ACPE

6.10.1 Condition of dryer hold down brackets.

6.10.2 Condition of the seating surface.

6.10.3 Condition of the attachment weld to the RPV head.

6.10.4 Record the steam dryer hold down bracket azimuth examined.

NOTE: This inspection is performed using direct visual techniques while the RPV head is on its storage pedestals.

6.11 Reactor Pressure Vessel Head - ACPE

6.11.1 General Condition of the inside surface adjacent to the top head vertical and horizontal pressure vessel welds (clad or unclad).

6.11.2 Record the location of the head weld examined.

NOTE: This inspection is performed using direct visual techniques while the RPV head is on its storage pedestals.

6.12 Feedwater Sparger End Bracket - ACPE

6.12.1 Condition of bracket to vessel wall weld.

6.12.2 General condition of bracket.

6.12.3 Record the feedwater sparger end bracket azimuth examined.





6.13 Feedwater Sparger - ACPE

- 6.13.1 General condition of feedwater sparger.
- 6.13.2 Condition of sparger welds.
- 6.13.3 Condition of nozzle welds or flow holes as applicable.
- 6.13.4 Condition of end bracket pins and tack welds.
- 6.13.5 Condition of end bracket welds
- 6.13.6 Record the Feedwater Sparger azimuth examined.

6.14 Feedwater Nozzle - ACPE

- 6.14.1 Condition of the nozzle inner radius accessible areas.
- 6.14.2 Condition of nozzle bore accessible areas.
- 6.14.3 Record the Feedwater Nozzle azimuth examined.

6.15 Core Spray Internal Piping Wall Bracket - ACPE

- 6.15.1 Condition of bracket to vessel wall welds.
- 6.15.2 Condition of the bolt head tack welds.
- 6.15.3 General condition of the bracket.
- 6.15.4 Record the core spray internal piping wall brackets examined.

6.16 Core Spray Internal Piping - ACPE

- 6.16.1 General condition of core spray header piping.
- 6.16.2 Condition of core spray header welds.
- 6.16.3 General condition of core spray downcomer piping.
- 6.16.4 Condition of core spray downcomer welds.
- 6.16.5 Condition of elbow welds.
- 6.16.6 Condition of junction (tee) box welds with particular attention to the heat affected zone of the flow divider welds.
- 6.16.7 condition of junction (tee) box to thermal sleeve area.
- 6.16.8 Record the azimuth or loop examined.





6.17 Core Spray Sparger - ACPE

6.17.1 Examine the four core spray spargers in at least four camera passes for the following:

- a) One pass concentrating on the upper sparger tack welds and nozzle conditions.
- b) One pass concentrating on the lower sparger tack welds and nozzle conditions.
- c) Two passes of different angles covering as much of the sparger pipe surface as possible including the tee welds.
- d) The examination should concentrate for cracks in the welds and the weld heat affected zones. Cracks have also been found in the sparger piping.
- e) Condition of the sparger supported brackets to sparger and top guide.

6.17.2 Record the areas examined.

6.18 Jet Pump Assembly - ACPE

- 6.18.1 Condition of beam bolt keeper and tack welds.
- 6.18.2 Condition of lock plate, flat head screws and tack welds.
- 6.18.3 Alignment and condition of hold down beam.
- 6.18.4 Condition of beam retainer.
- 6.18.5 Seating of ram head, nozzles and condition of inlet suction area.
- 6.18.6 Condition of riser brace and attachment weld to vessel wall
- 6.18.7 Condition of riser brace to riser weld.
- 6.18.8 Condition of wedge assembly.
- 6.18.9 Condition of the restrainer bracket, set screws and tack welds.
- 6.18.10 Condition of slip joint.
- 6.18.11 Condition of diffuser to adapter weld.
- 6.18.12 Condition of diffuser weld to shroud plate.
- 6.18.13 Record the jet pump assembly examined.



6.19 Jet Pump Sensing Line - ACPE

- 6.19.1 Condition of sensing line attachment welds to brackets.
- 6.19.2 Condition of bracket weld to diffuser.
- 6.19.3 Condition of the sensing line coupling welds.
- 6.19.4 Record the jet pump sensing line examined.

6.20 Shroud Support Plate Weld - ACPE

- 6.20.1 Condition of accessible shroud support plate weld to reactor vessel wall.
- 6.20.2 Condition of accessible shroud support plate weld to shroud.
- 6.20.3 Condition of accessible shroud stiffer welds (if applicable).
- 6.20.4 Record the section of shroud support plate weld examined.

6.21 Shroud - ACPE

- 6.21.1 General condition of the shroud/separator flange mating surface.
- 6.21.2 Record the section of the shroud/separator flange mating surface examined.
- 6.21.3 Condition of the inside surface accessible portion of the circumferential weld in the main cylinder section of the shroud. This weld is located between the core plate and the top guide (see Figure 1).
- 6.21.4 If indications are identified during the examination as required in paragraph 6.21.3, examine the outside area of the shroud weld that contains the suspect indications.
- 6.21.5 Record the section of the shroud circumferential weld examined.
- 6.21.6 Condition of the inside surface accessible portion of the two vertical welds in the main cylinder section, upper portion of the shroud (see Figure 1).
- 6.21.7 Condition of the inside surface accessible portion of the two vertical welds in the main cylinder section, lower portion of the shroud (see Figure 1).
- 6.21.8 If indications are identified during the examination as required in paragraph 6.21.5 and 6.21.6, examine the outside area of the shroud weld that contains the suspect indications.
- 6.21.9 Record the section of the shroud vertical welds examined.



6.21.9 If during the examinations of paragraphs 6.21.3, 6.21.6 or 6.21.7 indications are identified, other shroud welds may be required to be examined by the owner. Record these additional shroud welds examined.

6.22 Shroud Support Access Cover - ACPE

6.22.1 Condition of the shroud access cover weld to shroud support plate.

6.22.2 General condition of the access cover.

6.22.3 Record the azimuth of the access cover examined.

6.23 Instrument Dry Tube - ACPE

6.23.1 Condition of the upper two (2) feet of the dry tube.

6.23.2 Check for cracks in the spring housing.

6.23.3 Record the X-Y coordinates of the dry tubes examined.

NOTE: The four (4) fuel assemblies surrounding the dry tube should be removed to allow camera access. Be careful not to bump the dry tube. Inspect dry tubes from all four (4) directions (if accessible).

6.24 Surveillance Sample Holder - ACPE

6.24.1 Condition of the upper mounting bracket and weld.

6.24.2 Condition of the lower mounting bracket and weld.

6.24.3 General condition of the sample holder.

6.24.4 Record the sample holder examined.

6.25 Control Rod Drive Nozzle - ACPE

6.25.1 Condition of the nozzle inner radius area.

6.25.2 Record the azimuth of the CRD nozzle examined.

6.26 Top Guide Hold Downs - ACPE

6.26.1 Condition of bolt, keeper, wedge and tack welds.

6.26.2 Examine one pass around peripheral top guide and 2 center fuel cells and all 4 corners of each cell.

6.26.3 Record the location of the area examined.

6.27 Steam Dryer - ACPE

6.27.1 General condition of the lifting eye assemblies.



- 6.27.2 Condition of the attachment welds to the lifting eye and the dryer wall.
- 6.27.3 Condition of the bank vertical welds.
- 6.27.4 Condition of the small horizontal welds between the vertical welds near the bottom of the vertical welds and top of the upper support ring.
- 6.27.5 Condition of the upper and lower plugs in the bank area between the bank vertical welds (if required).
- 6.27.6 Condition of the bank horizontal welds.
- 6.27.7 Condition of the bank tie bar welds.
- 6.27.8 Condition of the manway cover weld.
- 6.27.9 Condition of the seal to bank weld.
- 6.27.10 Condition of the upper support ring to the seal weld.
- 6.27.11 Condition of the support lugs adjacent on the upper support ring..
- 6.27.12 Condition of the upper support ring consternating on the upper 2" looking for horizontal indications.
- 6.27.13 Condition of the upper support ring to the skirt weld.
- 6.27.14 Condition of the drain channel welds consternating on the bottom 2" of the vertical welds.
- 6.27.15 Condition of the skirt to skirt horizontal weld.
- 6.27.16 Condition of the lower support ring to skirt weld.
- 6.27.17 Condition of the upper and lower guides and welds.
- 6.27.18 Record the azimuth or location of the dryer that was examined.
- 6.28 Steam Separator - ACPE
  - 6.28.1 General condition of separator.
  - 6.28.2 Condition of lifting eye assemblies.
  - 6.28.3 Condition of outer peripheral (top and bottom) standpipes and welds.
  - 6.28.4 Record the area examined.



6.29 Steam Separator Shroud Head Bolt - ACPE

- 6.29.1 Condition of the shroud head bolt.
- 6.29.2 Condition of the locking collar assembly for wear.
- 6.29.3 Record the number of bolts examined.

6.30 Below Core Plate Examination (BCPE) - GENERAL

- 6.30.1 The IVVI examination is required when the components are made accessible during the normal refueling outage activities. Access for performing IVVI below the core plate requires the appropriate control cells to be disassembled, (ie, removal of the 4 fuel assemblies, support casting, control rod guide tube, CRD, unlatching of the CRD thermal sleeve and the placement of a valved flange over the CRD housing flange.).

6.31 Fuel Support Casting - BCPE

- 6.31.1 Condition of the tack welds securing the flow orifices.
- 6.31.2 General condition of the casting.
- 6.31.3 Check for proper seating in the guide tube.
- 6.31.4 Check the alignment pin in the core plate for excessive bending.
- 6.31.5 Condition of lower tie plate seating area in fuel support casting.
- 6.31.6 Record the location of the castings examined.

6.32 Control Rod Guide Tube - BCPE

- 6.32.1 General condition of guide tubes.
- 6.32.2 Check for debris inside the guide tube.
- 6.32.3 Condition of the spud fingers and pin located at the top of the CRD housing, inside of the control rod guide tube.
- 6.32.4 Check for proper seating of the guide tube.
- 6.32.5 Condition of guide tube seating surface when it contacts core plate.
- 6.32.6 Record the location of the guide tube examined.

6.33 Control Rod Drive Housing - BCPE

- 6.33.1 Condition of the weld between the CRD stub tube and the vessel bottom head.





- 6.33.2 Condition of the weld between the CRD housing and the stub tube.
- 6.33.3 General condition of the CRD housing.
- 6.33.4 Check for debris around the CRD housing.
- 6.33.5 Record the X-Y coordinates of the CRD's examined.
- 6.34 In-Core Guide Tube - BCPE
  - 6.34.1 Condition of the weld between the in-core and the vessel bottom head.
  - 6.34.2 Check the weld joining the in-core guide tube to the in-core housing.
  - 6.34.3 General condition of the in-core guide tube.
  - 6.34.4 Condition of the stabilizers.
  - 6.34.5 Check for debris around the in-core guide tubes.
  - 6.34.6 Record the X-Y coordinate of the in-core guide tube.
- 6.35 Standby Liquid Control Piping and RPV Differential Pressure Instrument Piping - BCPE
  - 6.35.1 Condition of the weld between the pipe and the vessel wall.
  - 6.35.2 Condition of the SLC support bracket welds.
  - 6.35.3 General condition of the SLC piping.
  - 6.35.4 Condition of the DPI support bracket welds.
  - 6.35.5 General condition of the DPI piping.
  - 6.35.6 Record the SLC or DPI piping examined.
- 6.36 Bottom Head Drain - BCPE -
  - 6.36.1 General condition of the drain line openings.
  - 6.36.2 Check for debris around drain line opening.
  - 6.36.3 Record the bottom head drain examined.
- 6.37 Core Plate Support - BCPE
  - 6.37.1 Condition of the fillet welds between the core plate and the support beams.
  - 6.37.2 Record the section of core plate supports that are examined



6.38 Shroud Support Pillars - BCPE (if applicable)

- 6.38.1 Condition of support pillar to lower vessel head weld.
- 6.38.2 Condition of support pillar to shroud weld.
- 6.38.3 Check for debris and pillar erosion.
- 6.38.4 Record the shroud support pillars examined.

6.39 Completion of Examination

- 6.39.1 Remove all inspection equipment from the reactor pressure vessel and clean up the area.
- 6.39.2 View and edit examination video tapes.
- 6.39.3 Complete all of the examination data sheets.
- 6.39.4 Verify no lost parts from the inventory list.

7.0 RECORDING

- 7.1 The visual examiner shall be responsible for recording of examination results that provide a basis for evaluation and facilitate comparison with the results of subsequent examinations.
- 7.2 The following relevant conditions must be reported as a minimum to the Owner as unacceptable.
  - 7.2.1 Structural distortion or displacement of parts to the extent the component function may be impaired.
  - 7.2.2 Loose, missing, cracked, or fractured parts, bolting or fasteners.



- 7.2.3 Foreign materials or accumulation of corrosion products that could interfere with control rod action or could result in blockage of coolant flow through the fuel.
  - 7.2.4 Corrosion or erosion that reduces the nominal section thickness by more than 5%.
  - 7.2.5 Wear of mating surfaces that may lead to loss of function.
  - 7.2.6 Structural degradation of interior attachments such that the original cross sectional area is reduced more than 5%.
  - 7.2.7 The components previous VT examination results shall be reviewed to verify that indications have not changed. If indications have changed, the visual examiner shall insure that the change is identified on the Examination Summary Sheet (Exhibit I).
- 7.3 Abnormalities detected shall be documented with sketches, photographs or other forms which will aid in the evaluation process.

#### 8.0 EVALUATION

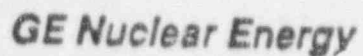
- 8.1 Components where examination either reveals indications that are in excess of the Owner's specification(s) or previously recorded indications that are significant larger than recorded shall be unacceptable for service. If Owner's specification is not provided, Paragraph 7.2 shall apply.
- 8.2 Visual examinations that detect surface flaws where practical, should be supplemented by either surface or volumetric examinations to determine the character of the flaw (size, shape and orientation).
- 8.3 The Lead Visual Examiner shall evaluate examination results to the inspection criteria specified in the Evaluation Section. The video tapes and recorded examination results shall be reviewed and evaluated by at least a Level II independent reviewer other than the examiners that performed the examination. This evaluation shall be documented on the Examination Summary Sheet (See Exhibit I).




- 8.4 The lead visual IVVI examiner shall notify the Owner's representative of any defects that will require additional engineering evaluation or any abnormalities that are unacceptable within 1 hour after the completion of the evaluation process.

#### 9.0 REPORTS

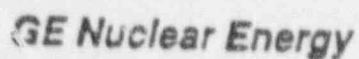
- 9.1 The examination results shall be recorded on the Invesel Visual Examination Data Sheets (See Exhibit II and III). Alternative data sheets may be used if the minimum information is recorded in accordance with the procedure requirements. After the IVVI examination is completed, the Examination Summary Sheet (Exhibit I) shall be filled out summarizing the examination that was performed.
- 9.2 The Invesel Visual Examination Data Sheets shall be prepared for all components examined. The format of the data sheet exhibits are subject to change as may be required. The Visual Examination Data Sheet shall include the following information as a minimum:
- a) Visual Examiner(s) signature(s) and level(s)
  - b) Date of Examination
  - c) Procedure Number, Revision Number, Field Revision Request Number
  - d) Type of visual examination (direct/remote)
  - e) Illumination Used, if any
  - f) Direct Visual Aids Used, if any
  - g) Remote Visual Equipment Used, if any
  - h) Identification of Components Examined
  - i) Examination Results
  - j) Location and Size of any indications
- 9.3 Should Owner request a report in addition to the Examination Summary Sheet and the Invesel Visual Examination Data Sheets, the report should be prepared and submitted to the Owner as specified by the contract.



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	<b>GE Nuclear Energy</b>	<b>EXAMINATION SUMMARY SHEET</b>	<b>REPORT NO.:</b>
<b>PROJECT:</b>		<b>PROCEDURE:</b> _____ REV. _____ PAGE NO. _____ _____ REV. _____ PAGE NO. _____ _____ REV. _____ PAGE NO. _____	
<b>SYSTEM:</b> _____ <b>WELD NO.:</b> _____ <b>COMPLIANCE:</b> _____ <b>EXAMINER:</b> _____ <b>LEVEL:</b> _____ <b>EXAMINER:</b> _____ <b>LEVEL:</b> _____ <b>EXAMINER:</b> _____ <b>LEVEL:</b> _____		<b>WELD METHOD:</b> <input type="checkbox"/> BT <input type="checkbox"/> PT <input type="checkbox"/> UT <input type="checkbox"/> RT <b>WELD TYPE:</b> <input type="checkbox"/> CONJUGATE SPHERICAL <input type="checkbox"/> LONGITUDINAL <input type="checkbox"/> OTHER _____ <b>DRAWING NO.:</b> _____ <b>REPORT NO.:</b> _____	
Large empty area for notes or additional data			
<b>SUBMITTED BY:</b> _____ <b>LEVEL:</b> _____ <b>DATE:</b> _____		<b>REVIEWED:</b> _____ <b>LEVEL:</b> _____ <b>DATE:</b> _____ <b>REVIEWED:</b> _____ <b>LEVEL:</b> _____ <b>DATE:</b> _____	
		PAGE _____ OF _____ FORM NO. 5-6-60	





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GE Nuclear Energy

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GE Nuclear Energy		INVESSEL VISUAL EXAMINATION DATA SHEET (CONTINUATION)	
SITE: _____ UNIT: _____		PROCEDURE NO. _____	REPORT NO. _____
PROJECT NUMBER: _____		REVISION NO. _____ PAGE NO. _____	
Component Description	Tape Number	Tape Counts	Examination Results
COMMENTS:			
PAGE ____ OF ____ FORM NO. 3-85-01			



GE Nuclear Energy

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TITLE: IN-VESEL VISUAL INSPECTION (IVVI)  
PROCEDURE FOR BWR 3 RPV INTERNALS

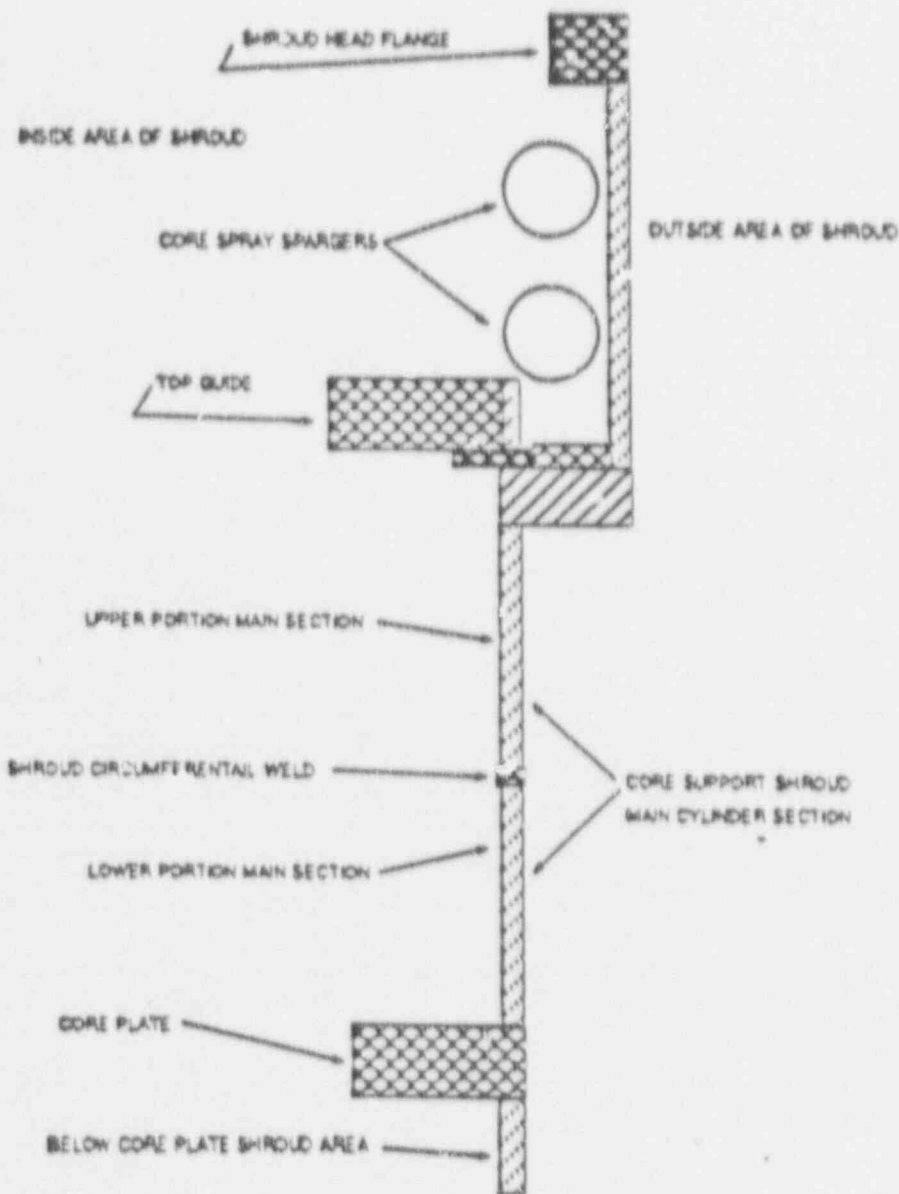


FIGURE 1