



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

AUG 09 2001

10 CFR 50.55a

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

In the Matter of) Docket No.50-390
Tennessee Valley Authority)

**WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - AMERICAN SOCIETY OF
MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION
(ISI) PROGRAM RELIEF REQUEST 1-ISI-07 THROUGH 1-ISI-12 - REQUEST
FOR ADDITIONAL INFORMATION (TAC NO. MB1274)**

The purpose of this letter is to provide a response to NRC's request for additional information concerning the subject relief requests which were submitted to NRC on February 21, 2001. The request for additional information was transmitted by e-mail from the NRC Project Manager on June 28, 2001.

The Enclosure provides TVA's response to the requested information. Attachment 1 to the Enclosure provides the revised ISI Report R-0569. Attachment 2 provides photos of the Unit 2 centrifugal charging pump which is similar to the Unit 1 pump and Attachment 3 provides photos of the Unit 2 residual heat removal system heat exchanger which is also similar to the Unit 1 heat exchanger.

A047

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No commitments are identified in this submittal. If you have any questions concerning this response, please contact me at (423) 365-1824.

Sincerely,



P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosure

cc (Enclosure):

NRC Resident Inspector
Watts Bar Nuclear Plant
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U.S. Nuclear Regulatory Commission

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Enclosure

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S:\SHARED\LROUSE\SUBMIT\PART 1 - ISI RAI.rnm.doc

S:\SHARED\LROUSE\SUBMIT\PART 2 - ISI ENCLOSURE ATTACHMENTS 1, 2, & 3

ENCLOSURE

**WATTS BAR NUCLEAR PLANT UNIT 1
INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12**

REQUEST FOR ADDITIONAL INFORMATION

ENCLOSURE

**WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12
REQUEST FOR ADDITIONAL INFORMATION**

On February 21, 2001, TVA submitted Relief Request 7 through 12 from the American Society Mechanical Engineers (ASME) Section XI Inservice Inspection (ISI) requirements. On June 28, 2001, the WBN NRC Project Manager transmitted to TVA a request for additional information by e-mail. Below is TVA's response to those questions.

General

To evaluate the following relief requests, please provide the following:

1. The edition of the ASME Code, Section XI applicable to this plant.
2. The start and end dates of the first 10 year interval for ISI.

Response

1. The edition of the ASME Code for WBN is ASME Section XI, 1989 Edition.
2. The start and end dates of the first 10-year ISI interval are May 27, 1996 through May 27, 2006. WBN is currently in the second period of the first 10-year interval.

Request for Relief No. 1-ISI-07

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from complete examination of the four integrally welded lug attachments to the centrifugal charging pump (1A-A) casing due to limited access resulting from component design configuration. A liquid penetrant examination was performed on accessible areas to the extent practical (i.e., 84 percent (%) of the required code coverage) given the physical limitations of the subject integrally welded attachments.

The licensee is requesting relief from the Code required 100% surface examination for the Centrifugal Charging Pump 1A-A integrally welded attachments. Additional information is required to find the licensee's relief acceptable.

ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12 REQUEST FOR ADDITIONAL INFORMATION

Question 1

- (a) It is clear from the drawing ISI-0118-C-01 (Attachment 1) that both pumps 1A-A and 1B-B are identically installed and operated. The sketches included in the Attachment 3 belong to pump 1B-B, while record of liquid penetrant Examination Report, R-0569, indicates weld ID CCPH-1A-A-IA. Clarify the discrepancy. Also, the relief is requested for the pump 1A-A. Provide the sketches for the pump 1A-A.
- (b) Based on the four sketches in Attachment 3, the total accessible area is 26.25 inch in total length of the weld is 127.5 inch. Therefore, the length of weld examined is 101.25 inch while the Liquid Penetrant Examination Report R-0569 indicated in its comments that the total length of weld examined is 107.25 inch. Clarify this discrepancy.

Response 1

- (a) The sketches in report R-0569 were copied from an earlier report on the 1B-B pump. The dimensions and location of the attachments were revised for the 1A-A pump but reference to the 1B-B pump was not removed. The sketches in report R-0569 have been revised for pump 1A-A and are included in Attachment 1 of this Enclosure.
- (b) A further review of the four sketches in Enclosure 1, Attachment 3 of the February 21, 2001 request for relief reveals the length of welds to be 29.5-inches, 30.25-inches, 36.25-inches, and 31.0-inches, respectively, for a total of 127.0 inches. The inaccessible areas were 6.5-inches, 6.75-inches, 6.5-inches, and 6.5-inches respectively for a total inaccessible area of 26.25 inches. The weld area receiving the penetrant testing (PT) examination should be indicated as 100.75-inches and not the 107.25-inches as indicated on Report R-0569. Based on this review the actual coverage achieved should be shown as approximately 80%, and not the 84% as indicated in the February 21, 2001, submittal. The report has been revised as shown in Attachment 1 of this Enclosure.

Question 2

The sketches provided in the Attachment 3 are not clear about the inaccessible area for PT exam. Provide some photos or actual drawings indicating the inaccessible areas.

ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12 REQUEST FOR ADDITIONAL INFORMATION

Response 2

Photos of the inaccessible area are included in Photo 1 and 2 of Attachment 2 of this Enclosure. The inaccessible area is under the integral attachment and behind the pump support. Note - since WBN Unit 2 is in a deferred status, photos are of the Unit 2 pump which has a similar configuration as the 1A-A pump. The Unit 2 pump which is located in a separate room is not contaminated, therefore, with no dose in the room, the pump is more accessible for photos than the Unit 1 pump.

Question 3

In the justification Section VI, it is indicated that:

- (a) "Connecting piping would have to be disconnected and pump disassembled and lifted to allow access to the remaining 16% examination area." Clarify which piping and demonstrate with photos why the pump has to be disassembled.
- (b) "The bottom side of the attachment is inaccessible due to a support which bolts the pump to the supporting frame." Illustrate how the bolt is interfering with the PT exam.
- (c) "Other NDE techniques were considered;..." What other NDE techniques were considered.
- (d) "The maximum...and adjacent metal of the subject weld provides reasonable assurance of an acceptable level of quality and safety." Illustrate the adjacent metal of the subject weld.

Response 3

- (a) The piping requiring disassembly is the inlet and outlet pump piping as shown in Photo 3 of Attachment 2. To obtain access to the inaccessible portion of the weld, this piping would be required to be disassembled, the pump uncoupled from the motor and the pump lifted off the pump support.
- (b) Refer to Photos 1, 2, and 3 in Attachment 2. It is not a bolt which interferes with the PT examination, but the configuration of the pump "bolted" to the support. As noted in the photos, the cylindrical pump housing is "cradled" on the pump support with the subject integral attachments

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WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12 REQUEST FOR ADDITIONAL INFORMATION

bolted to the pump support. The curvature of the pump support follows the curvature of the pump housing preventing access to the bottom weld of the integral attachment.

- (c) The other NDE technique considered was a visual examination
- (d) The "adjacent metal of the subject weld" is referring to the ½-inch metal of the pump housing past the toe of the weld. This ½-inch area is part of the examination surface as defined by ASME Section XI, Figure IWC-2500-5 [Enclosure 1, Attachment 2 of TVA's February 21, 2001 letter].

Request for Relief No. 1-ISI-09

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from performing the required volumetric examination on essentially 100% of the full volume of the residual heat removal (RHR) heat exchanger shell-to-flange weld. A volumetric examination of the full volume of the RHR heat exchanger shell-to-flange weld was performed on accessible areas to the extent practical given the design configuration of the shell-to-flange weld.

The design configuration of the RHR heat exchanger shell-to-flange weld precludes an ultrasonic examination of the required volume for the shell-to-flange weld. The location of the nozzle welds and support pads relative to the shell-to-flange weld is configured in such a manner that performance of an ultrasonic scan is limited to approximately 77% of the required examination volume. In order for the proposed alternative to be acceptable, please provide the following:

- (1) It is stated in Section VI that "As noted, the outside diameter of the nozzle is 18-1/2 inches and the width of the support pad is 18 inches. These are mounted on the 22-5/16 inches wide shell." Clarify this with sketches/photos.
- (2) Confirm that an attempt to perform a surface examination of the subject welds has been made.
- (3) Confirm that VT-2 visual examination will be performed during the pressure testing as required by Section XI.

Response

- (1) Photos of the subject area are provided in Attachment 3. The location of the 18½-inch nozzles and 18-inch wide

ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12 REQUEST FOR ADDITIONAL INFORMATION

support pad on the heat exchanger shell limits the scan area for the shell-to-flange weld. Note these photos are of the Unit 2 heat exchanger which has a similar configuration as the 1A heat exchanger. The Unit 2 heat exchanger is also located in a separate room with the insulation removed. Since Unit 2 does not have an operating license, there is no dose associated with the Unit 2 heat exchanger.

- (2) There was no attempt to perform a surface examination on this weld. The ASME Section XI, 1989 Edition, Table IWC-2500-1, Examination Category C-A, Item Number C1.10 examination method is volumetric only.
- (3) The required VT-2 visual examination is performed during system pressure test in accordance with Technical Requirement Instruction 1-TRI-74-901-A, "ASME Section XI Functional System Pressure Test RHR System - Train A." RHR Heat Exchanger 1A is included in the test boundary of this instruction.

Request for Relief No. 1-ISI-10

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from performing the required surface examination on essentially 100% of the examination surface of the Boron Injection Tank integrally welded attachments. The support leg covers the lower end of the pad preventing the surface examination on this portion of the weld. The examination resulted in approximately 78% of code required coverage being achieved on each of the 4 integrally welded attachments. In order for the proposed relief to be acceptable, please provide the following:

- (1) In Section VI, it is stated, "Other examination methods were also considered but cannot be performed due to the access limitation." Clarify what other methods considered and their limitations.

Response

A visual examination was considered but could not be performed due to access restrictions of the support leg and support pad configuration. [See Drawing No. ISI-0053-C-01, Enclosure 4, Attachment 1 of the February 21, 2001, submittal.]

ENCLOSURE

**WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12
REQUEST FOR ADDITIONAL INFORMATION**

Request for Relief No 1-ISI-11

Pursuant to 10 CFR 50.55a(g) (5) (iii), the licensee requested relief from performing the required volumetric examination on essentially 100% of the full volume of the Boron Injection Tank (BIT) shell-to-head circumferential welds. The code required 100% volumetric examination of the full volume of the Boron Injection Tank shell-to-head circumferential welds was performed on accessible areas to the extent practical given the design configuration of the shell-to-head weld.

The geometric configuration (taper) of the shell and the CF8A shell material prevents an effective scan from the shell side which prevents full examination coverage. The design configuration limits ultrasonic examination of the code required examination volume to approximately 60% for weld BIT-2 and 63% for weld BIT-3. In order for the proposed relief to be acceptable, please provide the following:

- (1) Confirm that an attempt to perform a surface examination of the subject welds has been made.
- (2) Confirm that VT-2 visual examination will be performed during the pressure testing as required by Section XI.

Response

- (1) There was no attempt to perform a surface examination on this weld. The ASME Section XI, 1989 Edition, Table IWC-2500-1, Examination Category C-A, Item Number C1.20 examination method is volumetric only.
- (2) The required VT-2 visual examination is performed during pressure testing in accordance with Technical Requirement Instruction 1-TRI-62-902, "ASME Section XI Inservice System Pressure Test - CVCS Outside Containment." The Boron Injection Tank is included in the test boundary of this instruction.

Request for Relief No. 1-ISI-12

Pursuant to 10 CFR 50.55a(g) (5) (iii), the licensee requested relief from performing the required volumetric examination on essentially 100% of the lower one-third volume of the Boron Injection Tank nozzle-to-head welds. In order for the proposed relief to be acceptable, please provide the following:

ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12 REQUEST FOR ADDITIONAL INFORMATION

- (1) It is noted in the justification that "As noted on examination reports R-0689 and R-0692 (Attachment 4), no ultrasonic scans were performed from the nozzle side of the weld due to the nozzle configuration." However, the examiners on both reports indicated that "100% BI-DIRECTIONAL COVERAGE WAS ACHIEVED WITH 45° BY SCANNING OVER THE WELD ON THE NOZZLE SIDE." However, just below this statement the reviewers stated that "80% COVERAGE ACHIEVED ON THE BI TANK VESSEL NOZZLE TO HEAD WELD." Clarify how the 80% coverage is calculated based on the 100% bi-directional coverages.

Response

The BI Tank is a vessel with wall thickness greater than 2.0-inches (see drawing No. ISI-0053-C-01, Enclosure 6, Attachment 1 of the February 21, 2001 submittal). The procedure used to perform the nozzle to vessel examinations was Procedure N-UT-77, 'ULTRASONIC EXAMINATION OF WELD IN VESSELS GREATER THAN 2-INCHES IN WALL THICKNESS MADE FROM AUSTENITIC OR HIGH NICKEL ALLOY MATERIALS,' which conforms with ASME Section V, Article 5, 1989 Edition. Article 5 requires the examination to be performed with two angles (normally 45 and 60-degrees). Because examination cannot be achieved using the 'bounce' (second leg) of the 60 degree refracted longitudinal waves, the weld did not receive bi-directional coverage, normal to the weld, with the required two angles.

ENCLOSURE
ATTACHMENT 1

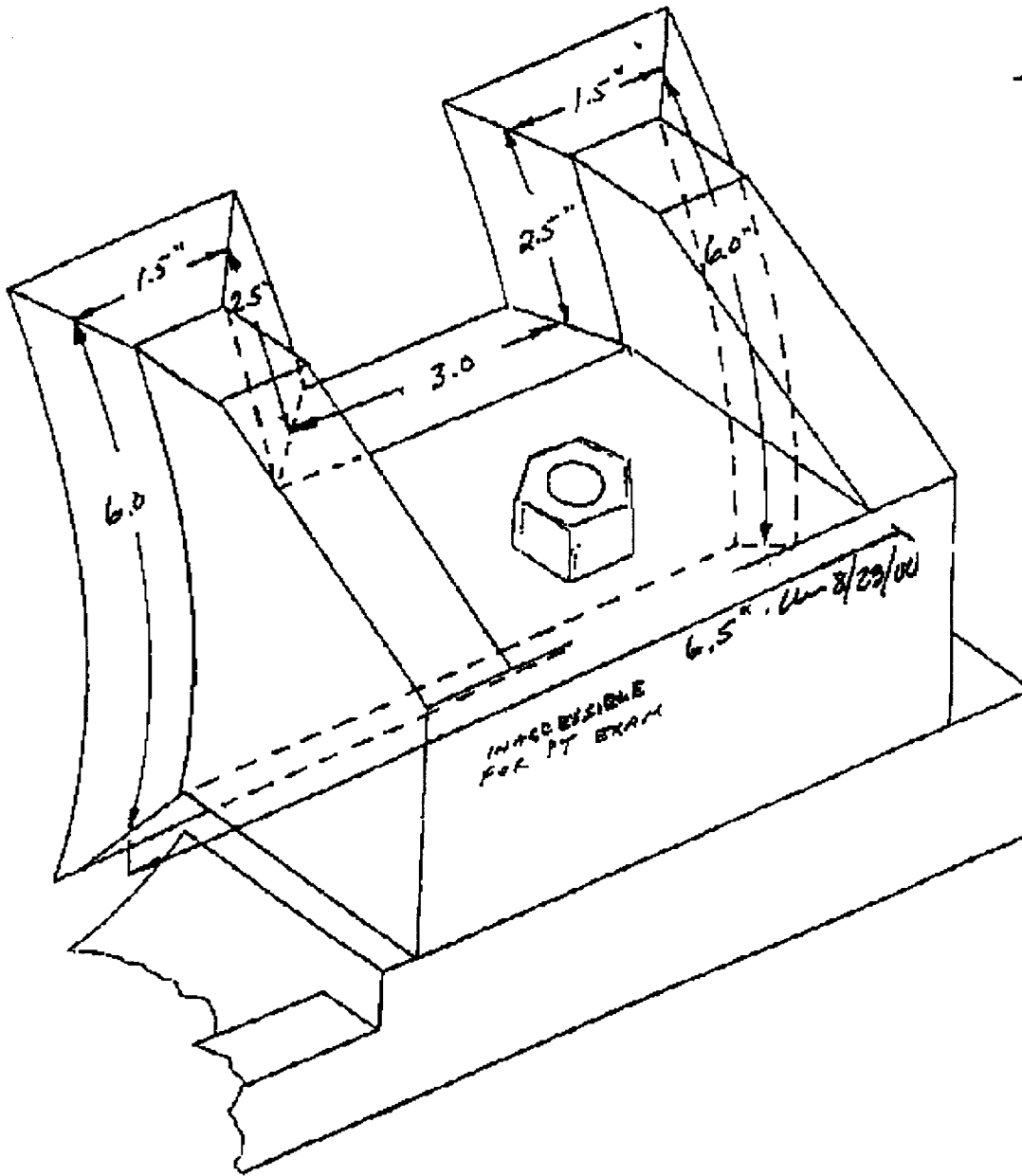
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12
REQUEST FOR ADDITIONAL INFORMATION

REVISED INSERVICE INSPECTION REPORT R-0569

Attachment 1
Watts Bar Nuclear Plant Unit 1

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0569</u>															
PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03A</u> SYSTEM: <u>CVCS</u> WELD/COMPONENT ID: <u>CCPK-1A-A-1A</u> CONFIG.: <u>TEMPWA</u> TO _____ PROCEDURE: <u>N-PT-9</u> REV.: <u>19</u> TC: <u>N/A</u> EXAMINATION CODE <u>89E-01</u> CODE CLASS: <u>2</u> CATEGORY: <u>C-C</u>		EXAMINATION DATE <u>08/23/00</u> START TIME <u>09:05</u> END TIME: <u>13:24</u> EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/> PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/> REF. DRAWING NO.: <u>FC48490</u>															
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COMMENTS/LIMITATIONS: <u>30% 7-25-01</u> <u>APPROXIMATELY 34-42% ASME CODE COVERAGE ACHIEVED. TOTAL WELD LENGTH IS</u> <u>127" TOTAL LENGTH OF WELD EXAMINED 107.25" SEE ATTACHED DRAWINGS</u>																	
EXAMINER: <u>Carmel La Soja</u> LEVEL: <u>II</u> EXAMINER: <u>Mark Welch</u> LEVEL: <u>II</u> REVIEWER: <u>W. B. ...</u> LEVEL: <u>III</u> DATE: <u>8-29-00</u>	ANI: <u>And 7/25/01</u> <u>B. Larnugh</u> DATE: <u>9/13/00</u> PAGE: <u>1 OF 5</u>																

R-0569



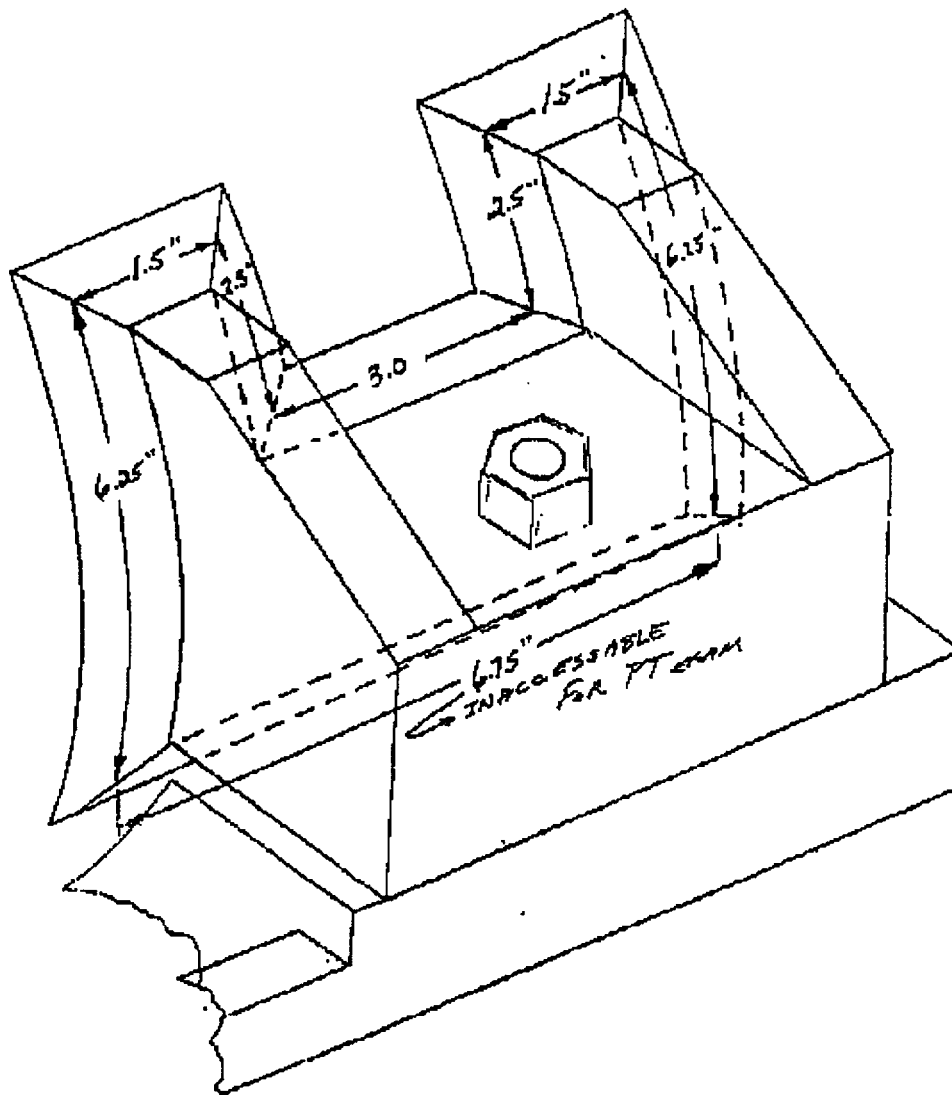
4" RIGHT SIDE
OUTBOARD WEST

6.5"

2.5"

Attachment 1
Watts Bar Nuclear Plant Unit 1

R-0569



4"

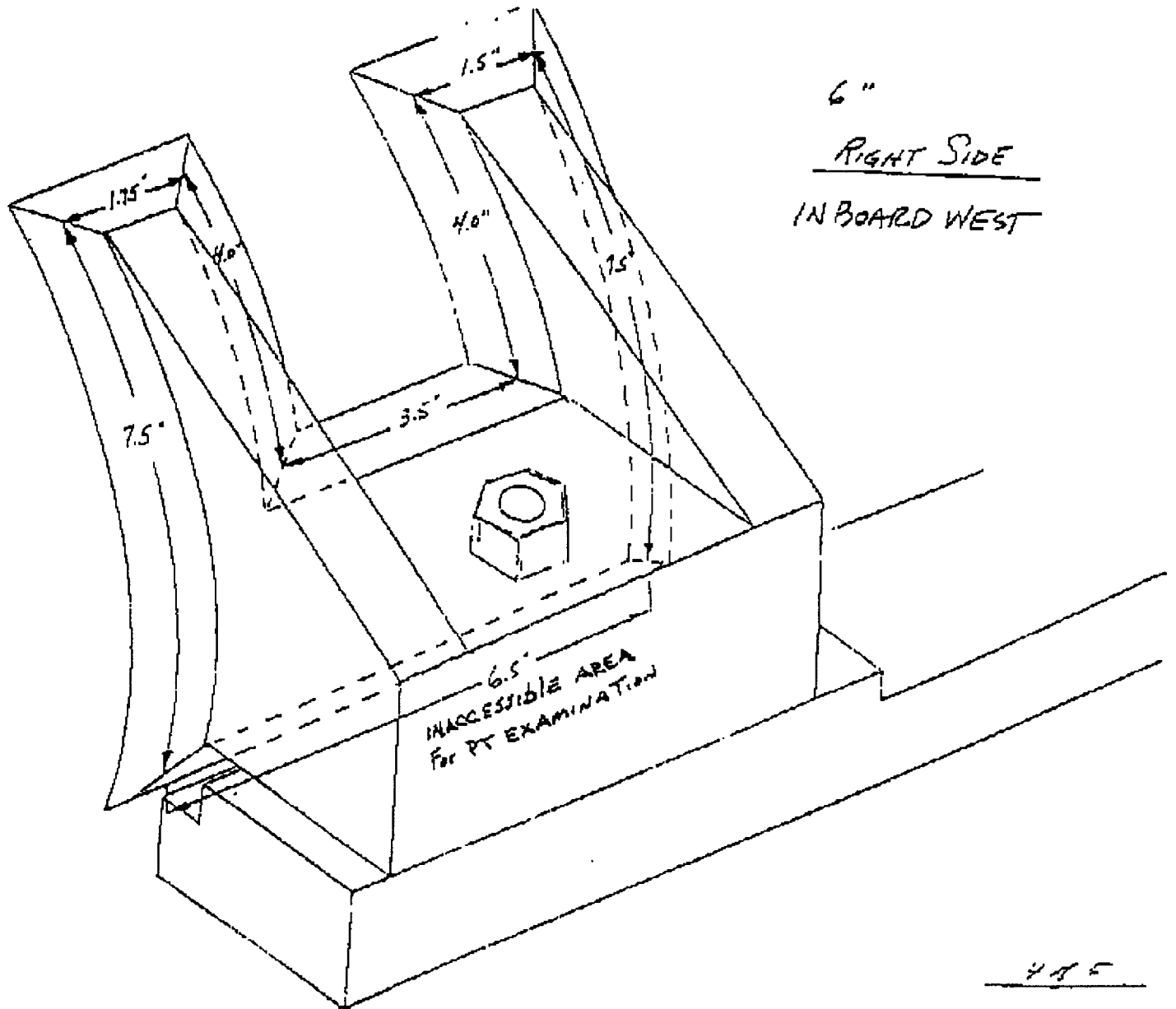
LEFT SIDE

OUTBOARD WEST

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Attachment 1
Watts Bar Nuclear Plant Unit 1

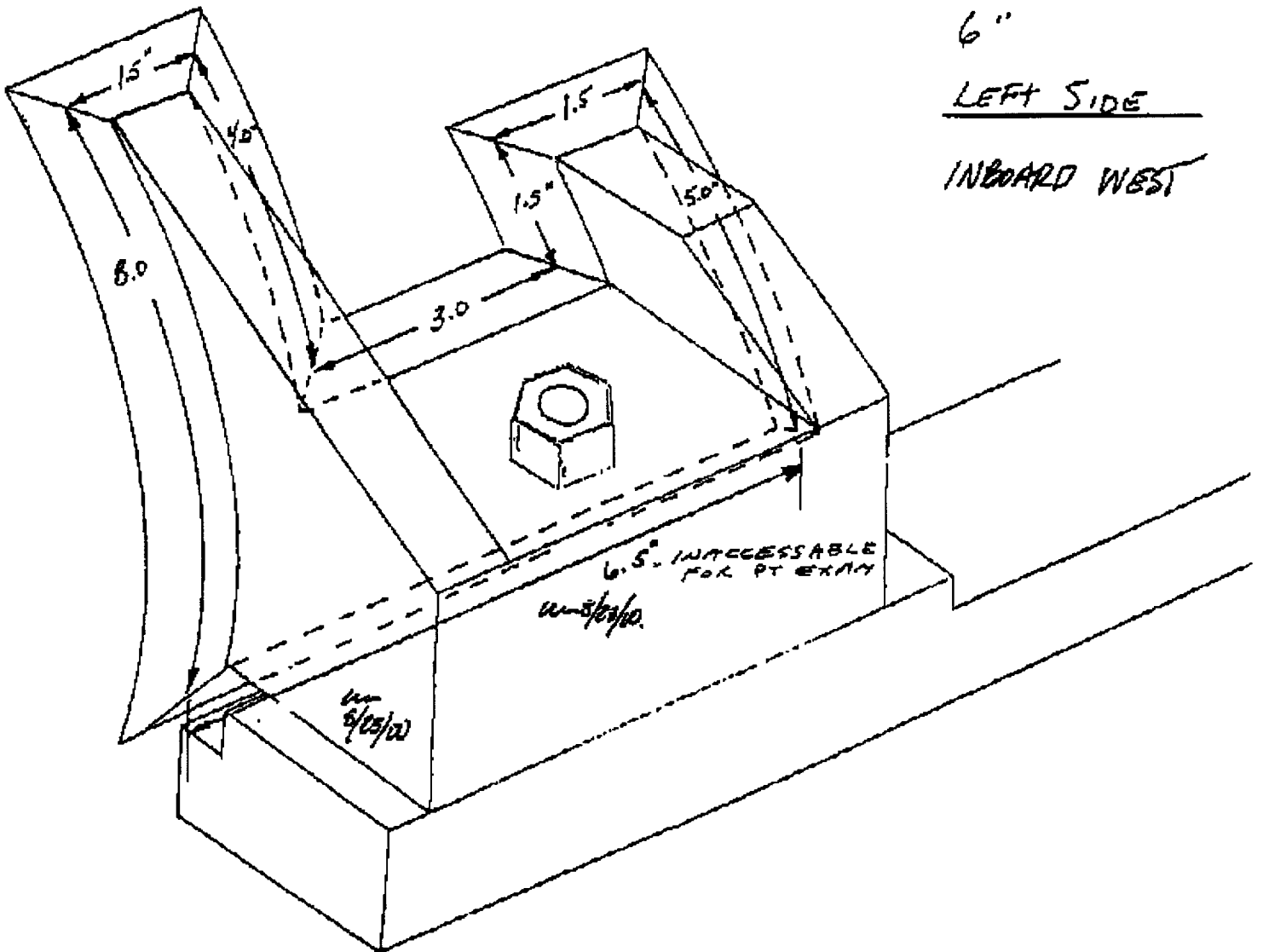
R-0569



Attachment 1
Watts Bar Nuclear Plant Unit 1

R-0569

6"
LEFT SIDE
INBOARD WEST



5-276

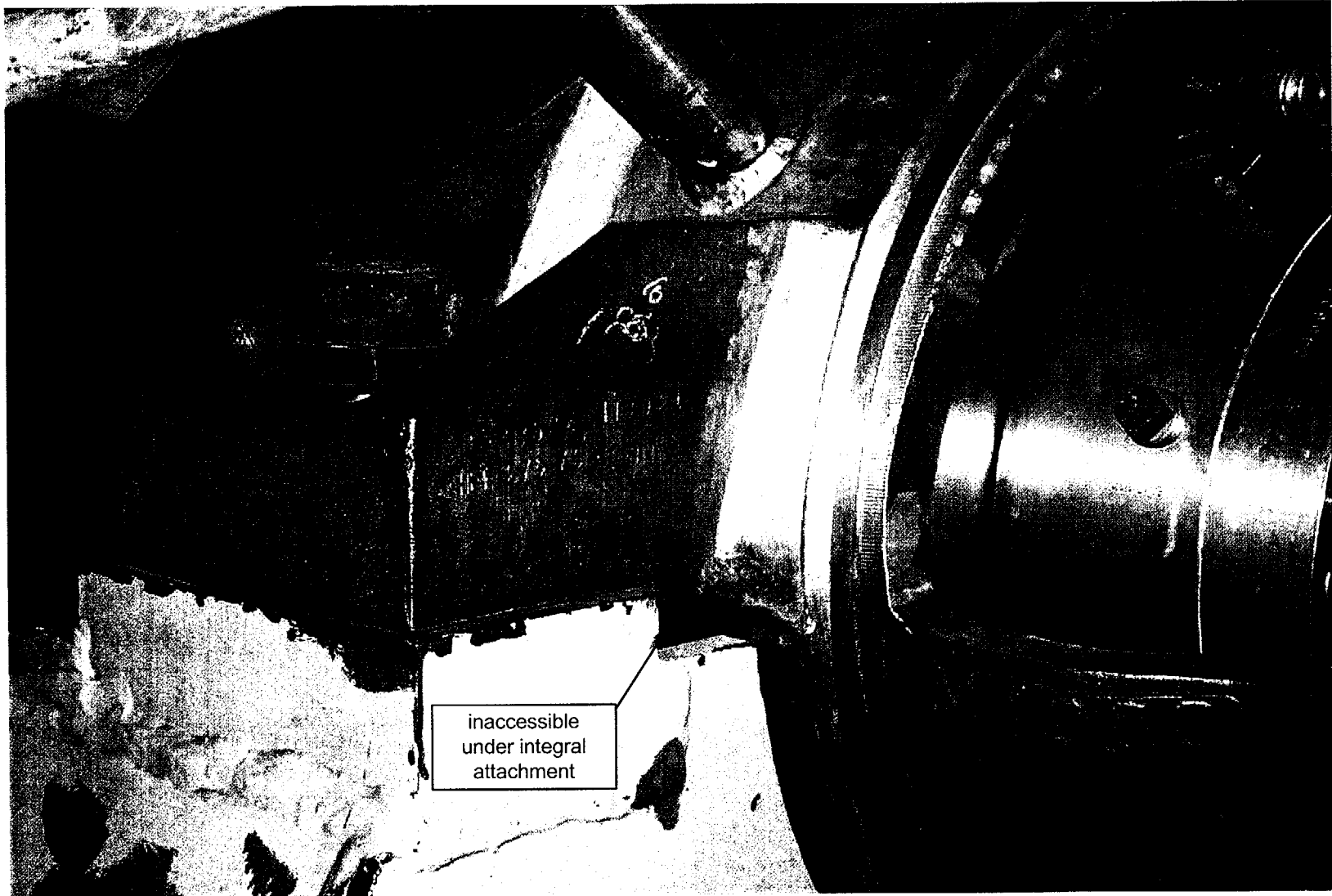
ENCLOSURE
ATTACHMENT 2

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12
REQUEST FOR ADDITIONAL INFORMATION

PHOTOS OF UNIT 2 CENTRIFUGAL CHARGING PUMP
SIMILAR CONFIGURATION

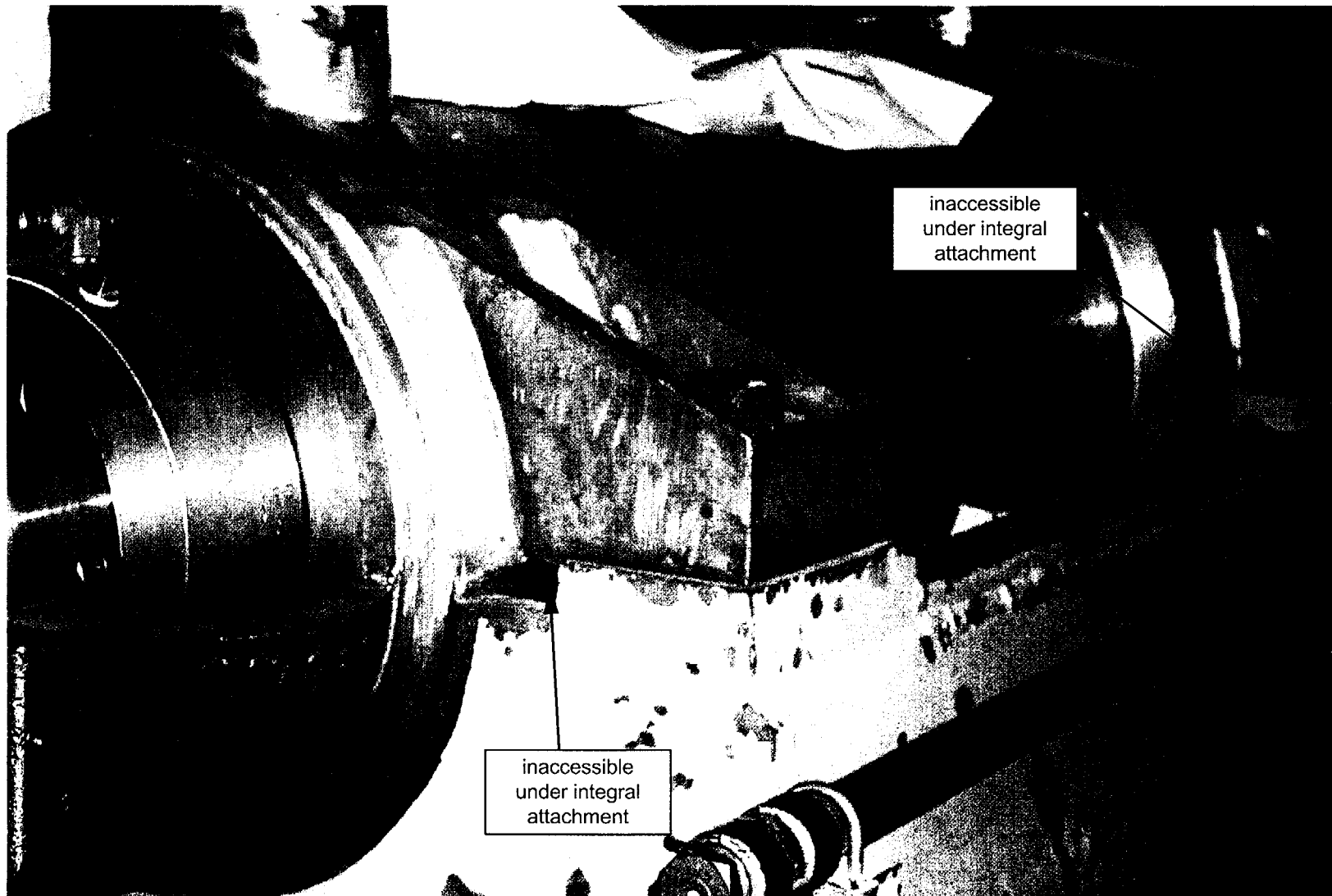
Attachment 2
Watts Bar Nuclear Plant Unit 1

Photo 1
Inaccessible Areas



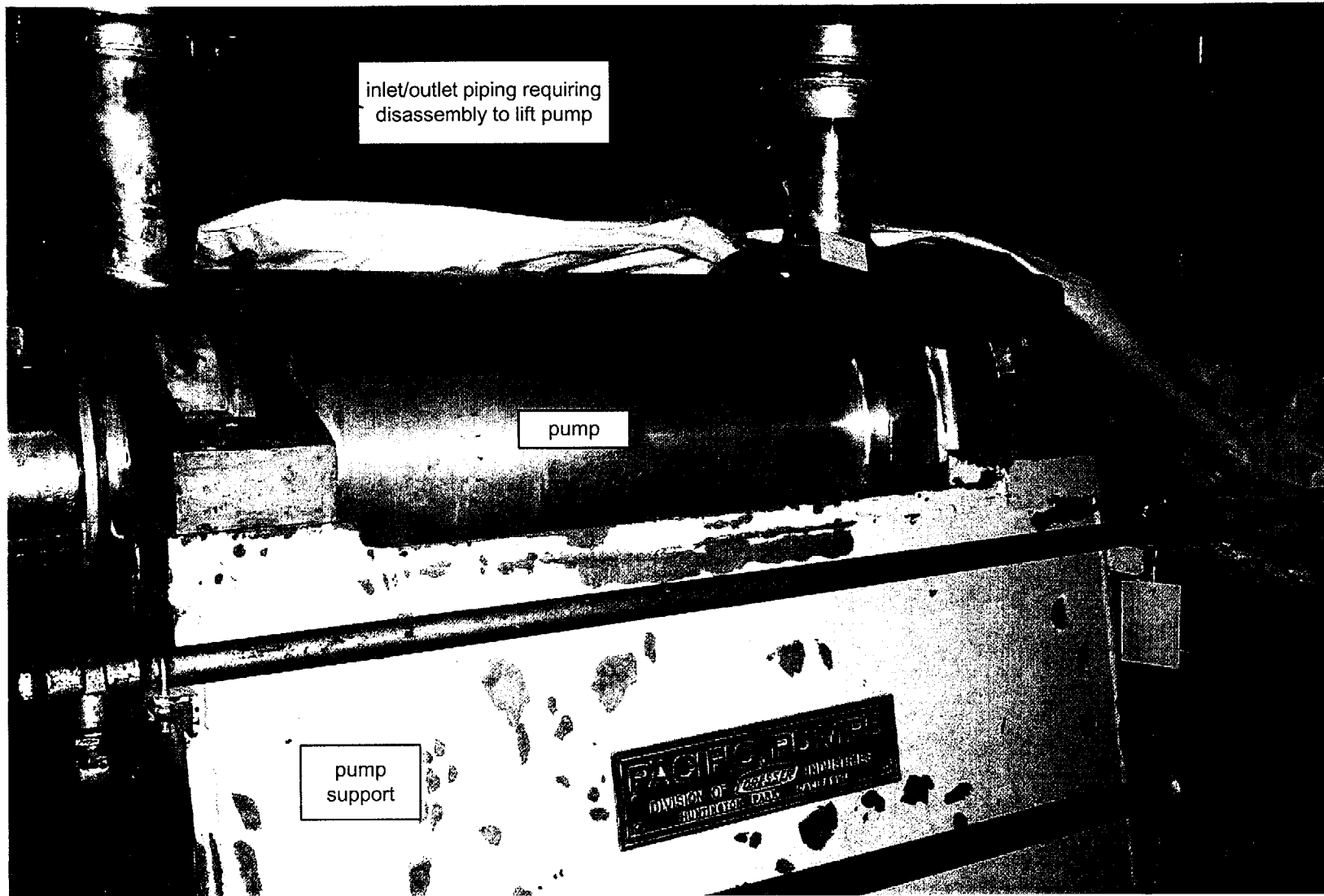
Attachment 2
Watts Bar Nuclear Plant Unit 1

Photo 2
Inaccessible Areas



Attachment 2
Watts Bar Nuclear Plant Unit 1

Photo 3
View of Pump, Pump Support and Piping



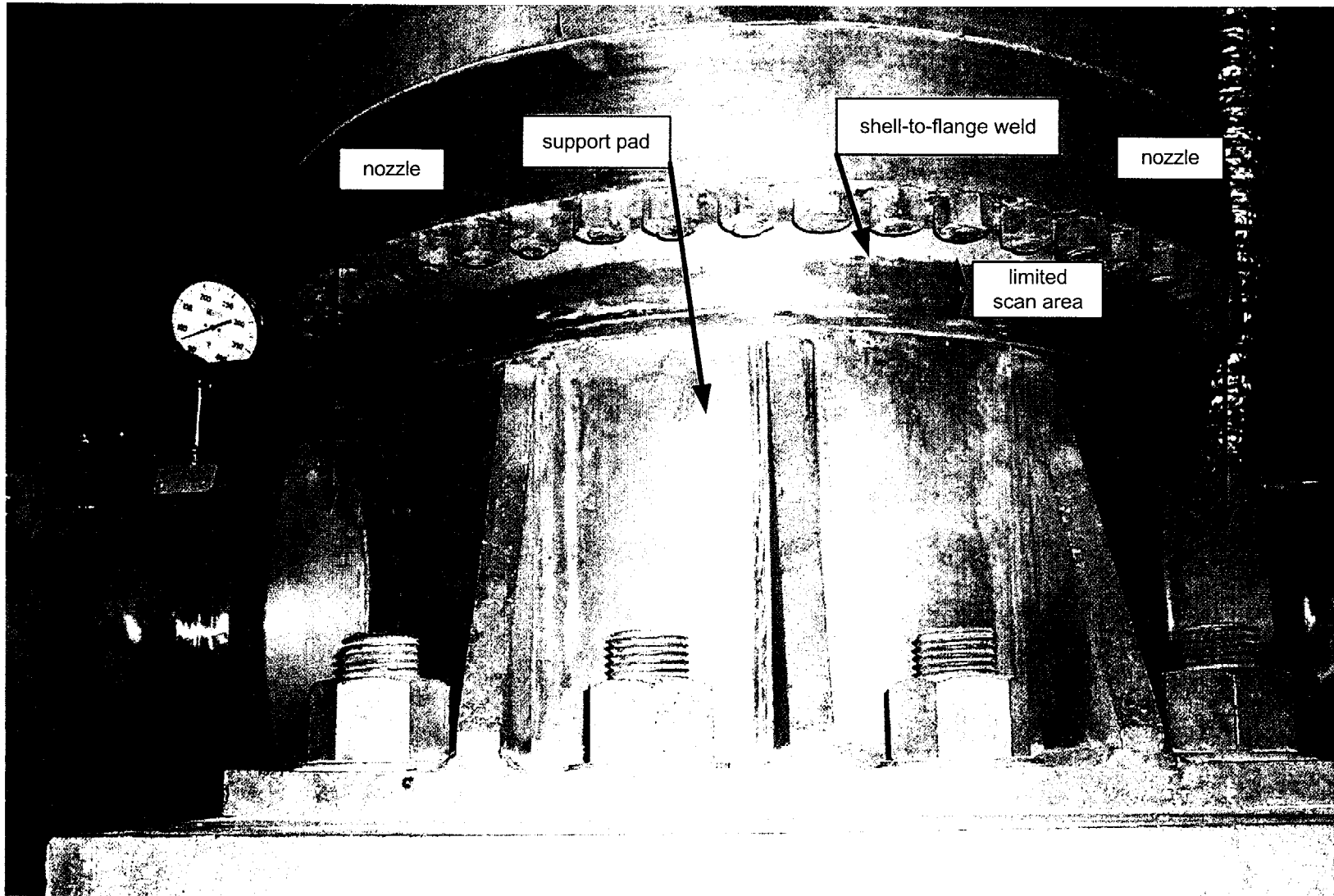
ENCLOSURE
ATTACHMENT 3

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM RELIEF REQUEST 7 THROUGH 12
REQUEST FOR ADDITIONAL INFORMATION

PHOTOS OF UNIT 2 RHR HEAT EXCHANGER
SIMILAR CONFIGURATION

Attachment 3
Watts Bar Nuclear Plant Unit 1

Photo 1
Shell-to-Flange Weld in Relation to
Nozzle and Support Pad



Attachment 3
Watts Bar Nuclear Plant Unit 1

Photo 2
Nozzle and Support Pad Location

