



BURT C. PROOM, CPCU
President

OFFICE OF THE GENERAL COUNSEL
Joseph T. Sullivan
Vice President and General Counsel

August 16, 1979

Mr. Ira Dinitz, Indemnity Specialist
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Ira:

Re: (1) Glenn S. Huey Claim
(2) O'Mallon vs. Westinghouse

As you requested, enclosed are copies of:

1. Our letter of 7/18/79 to Mr. Saltzman on the Huey claim.
2. The Summons and Complaint of John O'Mallon and Judith O'Mallon vs. Westinghouse Electric Corp. This suit is now in the U.S.D.C. for the Eastern District of New York. (It is being handled under the Con Ed policy).

Very truly yours,

Chester G. Alton
Associate Counsel

CGA/jr
Enclosures

M012
S/I
ADD:
DINITZ w/ENCL

7908210440

July 18, 1979

Mr. Jerome Saltzman, Deputy Chief
Office of Antitrust & Indemnity
Directorate of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Saltzman:

Re: Notice of Claim
Claimant: Glenn S. Huey
Facility: Jersey Central Power
& Light Company
O/L: Commencing April, 1979

This will advise that we have received a notice of the claim of Mr. Glenn S. Huey of 18 Koches Ave., Bricktown, New Jersey 08723.

The claim is for mental stress allegedly incurred by the Huey family due to the danger of radioactive contamination from the near-by Oyster Creek facility, amounting to \$50. a month starting with April, 1979.

Very truly yours,

Chester G. Alton
Associate Counsel

CGA/jr

DUPLICATE DOCUMENT

Entire document previously
entered into system under:

ANO 7907250315

No. of pages: 7

ENCLOSURE 1

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attn: Mr. A. Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No: 607/072079
PO/HSM:svm
Docket Nos.: 50-280
50-281
License Nos.: DPR-32
DPR-37

Dear Mr. Denton:

In your letter of July 20, 1979 additional information was requested on the use of high strength maraging steel in the reactor coolant pump supports. Enclosed herewith are the answers to your request for additional information.

If you require any further information we would be pleased to discuss this matter with your staff.

Very truly yours,

C. M. Stallings

C. M. Stallings
Vice President - Power Supply
And Production Operations

HSM/svm:IMI

Attachment

cc: Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement - Region II

Dupe of

7909190590 (R)
11pp.

QUESTION 1: Provide details of inspections performed on the monoball assemblies prior to installation into the plant. Provide significant results of any inspections. Include the threaded connection.

RESPONSE: Prior to fabrication all of the Vascomax used in the reactor coolant pump supports was subjected to a 100% ultrasonic inspection. In addition the actual physical property data (tensile, yield, impact, and chemistry) was provided for each material heat. Copies of these are attached. During fabrication all welds were liquid penetrant tested with magnetic particle testing used as an alternate. Prior to installation all of the support pieces were cleaned and visually inspected with particular attention given to the threaded area of the monoball assemblies.

QUESTION 2: Indicate the consequences of a complete failure of the reactor coolant pump supports during normal and postulated accident conditions.

RESPONSE: During normal operation the loads and stresses for piping, component connections, and other remaining component supports due to the complete failure of the reactor coolant pump supports are not sufficient to cause the failure of the reactor coolant system piping. Summarized below are the maximum stresses that can be expected in the reactor coolant piping as a result of failure of the reactor coolant pump supports during normal operation. These loads are within the allowable nozzle loads for both the steam generator nozzle and the reactor pressure vessel nozzles. The allowable stresses for the reactor coolant pipe material (A376 Tp 316) are also summarized below. While several of these values are above yield at 650°F, they are all less than 50% of the material's ultimate strength at that temperature. The reactor coolant pipe material has an S_n (Code allowable for normal operation) of 16 ksi at 650°F and the faulted allowable stress would be $1.85 S_n$ or 28.8 ksi. All of the loads summarized below are within this faulted allowable with the exception of the pressurizer inlet. However, thermal stresses have been conservatively included and their deletion brings the stress levels well within the allowables.

During any postulated accident condition, i.e. seismic and/or pipe breaks, a concurrent complete failure of the reactor coolant pump support would result in unacceptable consequences throughout the reactor coolant loop piping in terms of loads and stresses.

If these supports were to fail during operation it would be detected as there is vibration monitoring instrumentation on both the shaft and the frame of the reactor coolant pumps. The amount of vibration is indicated in the control room (it is recorded twice per shift) and any excessive vibration would cause an annunciator alarm to sound in the control room. The amounts of vibration necessary to trigger the annunciator alarms are vibration greater than 3 mils on the frame and greater than 15 mils on the pump shaft.

SUMMARY OF STRESS FOR FAILURE OF
REACTOR COOLANT PUMP SUPPORT
DURING NORMAL OPERATION

<u>Location</u>	<u>Loop</u>	<u>Stress (psi)</u>
Steam Generator Outlet	A	20,291
	B	17,388
	C	20,743
Reactor Vessel Inlet	A	16,943
	B	18,337
	C	21,060
Crossover Leg	A	21,940
	B	13,292
	C	20,196
Pressurizer Inlet	C	32,723

Material Properties (A376 Tp 316)

<u>°F</u>	<u>S_{yield}</u>	<u>S_{ult}</u>
100	30 ksi	75 ksi
600	18.8 ksi	71.8 ksi
650	18.5 ksi	71.8 ksi

QUESTION 3: Provide any alternative NDE methods available which could be used to inspect those areas of the monoball assembly not accessible except by disassembly.

RESPONSE: NDE of the inaccessible parts of the monoball assemblies is not warranted when taking into consideration the stress levels in that assembly. The areas of the monoball assembly which are not accessible are also the least stressed. As an example, the maximum shear stress in the threaded portion of the monoball assembly is only approximately 2400 psi.

The maximum stress occurs in the lug and clevis (items 1 & 2 in drawing 11448-FM-53C, attached to response to question 5) at the hole where the pin fits. The stress is very local in nature and drops off rapidly away from the hole.

During normal operating conditions the stresses in the monoball assembly are below the industry accepted threshold value (20 ksi) for the initiation of stress corrosion cracking. In addition all of the Vascomax parts are coated with heresite coating to prevent moisture intrusion in order to further protect them from stress corrosion cracking. Considering the aforementioned information it would seem that in lieu of disassembly a Holiday test (see description in attachment to question 6) of the coating would be called for to ensure that the coating is intact or if it isn't that the coating may be repaired.

QUESTION 4 Indicate the impact on your steam generator repair schedule of inspecting fully one monoball assembly on the reactor coolant pump support.

RESPONSE: The inspection program provided in question 6 has already been performed and has had little or no impact on the overall steam generator replacement schedule. If further inspections requiring disassembly are to be performed there may be some impact to the overall steam generator replacement schedule as will be described. Disassembly of the reactor coolant pump supports cannot be done until the welding of the reactor coolant pipe is completed in a particular loop due to the possibility of ruining the alignment of the piping between the reactor coolant pump and the steam generator. In order to not impact any of the major evolutions in the schedule, the inspection (disassembly and reassembly) would have to be completed before the reinstallation of the reactor coolant pump motors which is scheduled to occur about 7 days after the completion of the reactor coolant pipe welding. The reactor coolant pipe welding is presently anticipated to be completed for "B" loop about September 21, for "C" loop about September 30, and for "A" loop about October 15. It would not be possible to just disassemble just one monoball assembly as is suggested in your letter of July 20 as the only way that the supports may be disassembled is to remove one whole leg assembly (items 1-4 or 5-8, drawing 11448-FM-53A). In addition there is the uncertainty of possibly damaging these pieces during disassembly. These items are specialty items and have a long lead time for replacement.

QUESTION 5: Provide the maximum stress and stress state seen by any of the monoball assembly parts under normal operation and postulated accidents.

RESPONSE: The stresses on the monoball assembly are summarized in Table I and Table II. Table I shows the stresses during normal operation and Table II shows the stresses during accident conditions.

TABLE I

REACTOR COOLANT PUMP SUPPORTS STRESS SUMMARY - NORMAL OPERATION

Drawing No.	Item No./Description	Material	Allowable		F _c (kips)	Calculated		F (kips)	Min. Factor of Safety
			σ_t (ksi)	σ_s (ksi)		σ_t (ksi)	σ_s (ksi)		
11448-FM-53B	1-4 Upper Leg: pipe cap pipe	Al05 Gr II	29.52	19.68	--	1.40	0.88	--	
		Al06 Gr B	28.71	--	830.6	1.40	--	0	
	5-8 Lower Leg: pipe cap pipe	Al05 Gr II	29.52	19.68	--	1.4	0.93	--	
		Al06 Gr B	28.71	--	810.8	1.44	--	0	
	26 Clevis	Al05 Gr II	29.52	19.68	--	0.15	0.14	--	
	37 Clevis	Al05 Gr II	29.52	19.68	--	0.42	0.14	--	
11448-FM-53C	1 Lug End	350 CVM	292	195	--	18.09	4.59	--	
	2 Clevis End	350 CVM	292	195	--	17.82	3.43	--	
	3 3 3/4 ϕ pin	350 CVM	--	195	--	--	3.62	--	
11448-FM-53D	9 Horizontal: pipe cap pipe	Al05 Gr II	29.52	19.68	-- (-)	1.22	1.12	--	
		Al06 Gr B	28.71	--	156.5(-)	1.22	--	13.14	
	10 Upper Diag. pipe cap pipe	Al05 Gr II	29.52	19.68	--	0.11	0.10	--	
		Al06 Gr B	28.71	--	157.2	0.11	--	0	
	35 Lower Diag. pipe cap pipe	Al05 Gr II	29.52	19.68	--	0.49	--	--	
		Al06 Gr B	28.71	--	322.6	0.49	0.62	0	
11448-FM-53H	16,33 4 3/4 ϕ pin		Al93 B7	--	41.94	--	--	0	--
	17,18 Support Beam: Rod Clevis Pipe	350 CVM	292	195	103.2	0	0	0	
		300 CVM	243	162	--	0	0	--	
		Al06 Gr B	28.71	--	837.6	0	--	0	
	19,20 Support Beam: Clevis Pipe	300 CVM	243	162	--	0	0	--	
		Al06 Gr B	28.71	--	837.6	0	--	0	

-- Indicates no stress imposed in that direction.
F_c Critical load for buckling.

TABLE II

REACTOR COOLANT PUMP SUPPORTS STRESS SUMMARY - ACCIDENT CONDITIONS

Drawing No.	Item No./Description	Material	Allowable		F _c (kips)	Calculated		F (kips)	Min. Factor of Safety
			σ_t (ksi)	σ_s (ksi)		σ_t (ksi)	σ_s (ksi)		
11448-FM-53B	1-4 Upper leg: pipe	Al06 Gr B	28.71	--	830.6	8.32	--	562.32	1.48
		Al05 Gr II	29.52	19.68	--	8.32	6.40	--	3.08
	5-8 Lower Leg: pipe	Al06 Gr B	28.71	--	950.6	11.15	--	815.51	1.17
		Al05 Gr II	29.52	19.68	--	11.15	9.47	--	2.08
11448-FM-53C	26 Clevis	Al05 Gr II	29.52	19.68	--	7.39	6.66	--	2.95
		Al05 Gr II	29.52	19.68	--	20.45	6.86	--	1.64
	37 Clevis	Al05 Gr II	29.52	19.68	--	7.39	6.66	--	2.95
		Al05 Gr II	29.52	19.68	--	20.45	6.86	--	1.64
	1 Lug End	350 CVM	292	195	--	107.84	27.34	--	2.71
	2 Clevis End	350 CVM	292	195	--	138.47	26.62	--	2.11
	3 3 3/4 ϕ pin	350 CVM	--	195	--	--	36.92	--	5.28
11448-FM-53D	9 Horizontal: pipe	Al06 Gr B	28.71	--	156.5	7.76	--	79.89	1.96
		Al05 Gr II	29.52	19.68	--	7.76	7.10	--	2.77
	10 Upper Diag. pipe	Al06 Gr B	28.71	--	157.2	5.50	--	47.77	3.29
		Al05 Gr II	29.52	19.68	--	5.50	5.04	--	3.90
	35 Lower Diag. pipe	Al06 Gr B	28.71	--	322.6	12.17	--	192.11	1.68
		Al05 Gr II	29.52	19.68	--	12.17	15.34	--	1.28
	16,33 4 3/4 ϕ pin	Al06 Gr B	28.71	--	322.6	12.17	--	192.11	1.68
		Al05 Gr II	29.52	19.68	--	12.17	15.34	--	1.28
11448-FM-53H	17,18 Support Beam:	Al193 B7	--	41.94	--	--	23.92	--	1.75
	Rod	350 CVM	292	195	276.4	23.40	8.82	111.65	2.47
		300 CVM	243	162	--	122.84	24.26	--	1.98
		Clevis			837.6	12.73	--	446.60	1.88
		Pipe	Al06 Gr B	28.71	--	--	--	--	--
	19,20 Support Beam:	Clevis	300 CVM	243	--	144.68	28.57	--	1.68
		Pipe	Al06 Gr B	28.71	--	837.6	14.99	379.47	1.91

-- Indicates no stress imposed in that direction.

QUESTION 6 Provide the procedures that are intended to be used to inspect the reactor coolant pump supports.

RESPONSE: Attached is a copy of the procedure used to inspect the reactor coolant pump supports. No significant findings resulted from this inspection other than the need for touchup of the heresite coatings.

SECTION B

Item - Vasco Clevis (Lug End)

Drawing - 11448-FM-53C, Item 1

No. Pcs. - 4 Heat No. - 1971A(2 Pcs.); 2041A(1 Pc.); 2133A(1 Pc.)

Raw Material - NSC Purchase Order 104N-7431-4, Item 1-A
I.R. No. 33.8.3(32)
I.R. No. 33.8.3(59)

Machining - NSC Purchase Order 104N-5849-4, Item 1
I.R. 33.8.3(149)

Heat Chart No. - BE-623

NUCLEAR SERVICE AND CONSTRUCTION COMPANY INC

CTION REPORT

CM - Yes

CONTRACT NO.

104N

INSPECTION DATE

JANUARY 30, 1970

CHARGE NO.

104N

FILE NO.

33.8.3(22)

☐ INSTALLATION

☒ Receipt OTHER

PROCEDURE NO.

33-1 (Procurement - Raw Materials)

VASCO Steel

P.O. NO.

104N-7432-4

LINE
NO.

ITEM
NO.

QTY.

DESCRIPTION AND INSPECTION REMARKS

1

7

VASCO Steel, 8-1/8" x 12-1/4" x 20",
Heat Number 1971A

1

9

VASCO Steel, 8-1/8" x 12-1/4" x 20",
Heat Number 2041A

NOTES:

1. No deficiencies noted.
2. All stamped with heat number.
3. All mill test reports received.
4. Inspected at NKS & DD Co.

POOR ORIGINAL

DC:ccc

INSTRUCTIONS:
Stone & Webster/Mr. H. G. Selevsky
Mr. T. W. Kilpatrick, Jr./JLP/FILE
Mr. A. F. Ciannavei/LWH
Mr. E. G. Adams/SRY
Mr. W. R. Graham

1 - Mr. B. P. Hall

DISPOSITION OF MATERIAL

Satisfactory - Released

DATE

JANUARY 30, 1970

WALSH COMPANY

LATROBE, PA. 15050

ANALYSIS REPORT

to: Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

JAN 27 '70



NUCLEAR SERVICE AND
CORROSION CO., INC.

Order No. 1042-7431-4

Order No. V0251712

nd: CVM Vasco Max 350 Solution Annealed

Spec: SAE 304 & Webster NUC-214 Revised November 27, 1960

SIZE: 12-1/4" x 20" 7 pas.

WEIGHT: 4129#

1071-A

DATE SHIPPED

1/22/70

Material Test Properties Analysis Term. 950° Time 3 HOURS

	23-171	23-172	23-173	23-174
S. Pot	34200	34300	33500	33600
S. Pot	33700	33700	33000	33000
Yield 0.2 Percent				
Elongation %	14.6	16.9	12.4	12.4
Reduction %	3.0	3.0	3.0	3.0

Material No. 32.3
Thin Size - 0.1

Acid Etch - Satisfactory to NUCSTD 430, Sae2, R-2, & C-2
Ultrasonic Inspection - Satisfactory to Stone & Webster NUC-214
Revised November 27, 1960

Non-Metallic Results

A		B		C		D		E	
Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Impact Toughness
K_{IC} 23 = 31.0, 31.5, 34.3
23-171 = 29.5, 30.0, 27.7

POOR ORIGINAL

Analysis

	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
1-A	.011	.02	.03	.007	.004				4.74	11.80	10.50
At .11			Ti 1.25		B .002		Zr .011		Ca .05 Added		

born and subscribed to before me
12th day of January, 1970:

Certified Correct

NOTARY PUBLIC

JOHN L. AUTH, NOTARY PUBLIC
CLAYTON, WEAVER COUNTY

LABORATORY MANAGER

LATROBE, PA. 15050

ANALYSIS REPORT

JAN 27 '70



NUCLEAR LABORATORY
CONFIDENTIAL

Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

Order No. 1044-7431-4

Order No. V4251712

Spec: CVM Vasco Max 350 Solution Annealed
Spec: Vasco & Webster HUS 214 Revisited November 27, 1969

SIZE

12-1/4" x 20"

2 pgs.

WEIGHT

52730

HEAT No.
2041-A

DATE SHIPPED

1/21/70

Individual Metastable Properties Arising From 950° Heat 3 Hours

	214-IR1	104-IR1
S. Pot	337000	339000
S. Pot	330000	331000
Reduction %	12.2	17.6
Elongation %	2.5	3.0

needed Re = 22.7

Gold Etch - Satisfactory to MIL-STD 400, S-2, R-2, & C-2

min Size = 6.0

Ultrasonic Inspection - Satisfactory to Vasco & Webster HUS-214
Revisited November 27, 1969

Non-Metallic Rating

A	B	C	D	E
Thin Heavy	Thin Heavy	Thin Heavy	Thin Heavy	Thin Heavy
0 0	0 0	0 0	0 0	3/4 0
0 0	0 0	0 0	0 0	1 1/2 1/2

Fracture Toughness
K_{1C}

2X = 34.6, 35.3, 39.2
1D = 36.4, 34.6, 34.2

POOR ORIGINAL

Analysis

cat	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
o.											
12-A	.026	.04	.02	.003	.006				4.73	11.97	10.54
	Al .12		Ti 1.20	B .003		Zr .007		Ca .05 Added			

worn and subscribed to before me

this 27th day of January, 1970:

John J. Auth

JOHN J. AUTH, NOTARY PUBLIC
CLAY COUNTY

Certified Correct

James J. ...

LABORATORY MANAGER

NUCLEAR SERVICE AND CONSTRUCTION COMPANY, INC

INSPECTION REPORT

CN - Yes

CONTRACT NO.

104N

INSPECTION DATE

February 6, 1973

CHANGE NO.

104N-1

FILE NO.

22.2.1.1

SHOP

☐ INSTALLATION

☒ RECEIPT OTHER

ITEM

P.O. NO.

104N-7431-4

PROCEDURE NO.

33-1 (Procurement - Raw Materials)

VASCO Steel Block

DRAWING
NO.

ITEM
NO.

QTY.

DESCRIPTION AND INSPECTION REMARKS

1

1

One Pcs. VASCO Steel Block, 8-1/8" x 12-1/4" x 20-1/4"
to Stone & Webster Specification NUS-214.
Inspected. Heat Number 2133A stamped on block.

NOTES:

1. No deficiencies noted.
2. Material test report received.
3. Material at NNS & ID Co.

POOR ORIGINAL

SA:ec

DISTRIBUTION:

TWX/AFC

Mr. Salevsky

LMW

BPH

CSM

JLP/FILE

WRG

Mr. R. M. Donaldson

DISTRIBUTION:

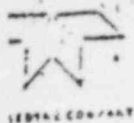
DISPOSITION OF MATERIAL

Satisfactory - Released

Inspection by: C. J. Nuss

DATE

February 27, 1973



VASCO
LATROBE, PA. 15650

FORM VASCO 300-1-68

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

1-12-

Order No. 104N 7431 4 Part

Order No. V-251712

and: CVM Vasco Max 350 Solution Annealed
Spec: Stone & Webster NUS 214 Revised November 27, 1968

SIZE

BARS

WEIGHT

HEAT No.

DATE SHIPPED

1 x 12-1/4" x 20" 1g.
2 pcs.

585H

2133-A

1/27/70

Longitudinal Tensile Properties Aging Temp 950° Time 6 Hours

No.	1B-MR	1BMM-MR
T.S. Psi	348400	344400
Y.S. Psi	339400	335300
Offset 0.2 Percent		
Reduction %	10.0	14.7
Elongation %	2.0	3.0

Annealed Rc 29.6

Acid Etch - Satisfactory to MIL-STD 430, S-2, R-2, & C-2

Grain Size 6.1

Ultrasonic Inspection - Satisfactory to Stone & Webster NUS-214
Revised November 27, 1968

Non-Metallic Rating

	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
T	0	0	0	0	0	0	0	0	3/4	0
B	0	0	0	0	0	0	0	0	1 1/4	0

Fracture Toughness will be reported at a later date.

Heat
Co.

C

Si

Mn

S

Analysis

P

W

Cr

V

Mo

Co

Ni

33-A

.012

.04

.04

.005

.004

4.66

11.83

13.1

Al

.11

Ti 1.38

B .002

Zr .005

Ca .05 Added

Isworn and subscribed to before me

On 17th day of February, 1970:

Certified Correct

WILLIAM H. HENRY III
LABORATORY MANAGER

LABORATORY MANAGER

SECTION H

Item - VASCO Clevis End

Drawing - 11446-FM-53C, Item 2

No. Pcs. - 8

Heat No. 2027A on 2

Heat No. 2147A on 3

Heat No. 1967A on 3

Raw Material

NSC Purchase Order 104N-7431-4, Item 2
I.R. No. 33.8.3(80), (43)

Stress Relieve Heat Chart No. BE-623

Machining -

NSC Purchase Order 104N-5849-4, Item 2
I.R. No. 33.8.3(138)

NUCLEAR SERVICE AND CONSTRUCTION COMPANY INC

INSPECTION REPORT

CM - Yes

CONTRACT NO.
104N

INSPECTION DATE
February 6, 1970

FORM 12

☐ SHOP

☐ INSTALLATION

☒ RECEIPT OTHER

CHANGE NO.

104N-100

FILE NO.

23.8.3/10

SUBJECT

VASCO Steel Blocks

P.O. NO.

104N-7431-4(2)

PROCEDURE NO.

33-1 (Procurement - Raw Materials)

DRAWING NO.	ITEM NO.	QTY.	DESCRIPTION AND INSPECTION REMARKS
	2	12	<p>12 Pcs. of VASCO Steel Blocks to Stone & Webster Specification NUS-214, Purchase Order Size, 8-1/8" x 9-1/4" x 22-1/8" were inspected. Actual sizes and heat numbers are as follows:</p> <p>3 Pcs. - 8-1/8" x 9-1/4" x 22-1/8", Heat Number 2027A 6 Pcs. - 8-1/8" x 9-1/4" x 22-1/4", Heat Number 2027A 3 Pcs. - 8-1/8" x 9-1/4" x 22-3/8", Heat Number 2027A</p> <p>NOTES:"</p> <ol style="list-style-type: none"> Heat Numbers stamped on each piece. Mill test report received. No deficiencies noted. Material at N.N.S. & D.D. Co.

EGA:ecg

DISTRIBUTION:

- 1 - Mr. H. G. Salevsky/SAW Repr. - NNS & DD Co.
- 1 - Mr. T. W. Kilpatrick, Jr./JLP/File
- 1 - Mr. A. F. Ciannavet/LMW
- 1 - Mr. E. G. Adams/STW
- 1 - Mr. B. P. Hill
- 1 - Mr. W. R. Graham

DISPOSITION OF MATERIAL

Satisfactory - Released

DATE

VASCO
LATRODE, PA. 15650

ANALYSIS REPORT

Customer: **Hampers Hand Shipbuilding & Dry Dock Company**
Hampers Hand, Virginia

Your Order No. **10114/1014 Part**

Our Order No. **V-251712**

Brand: **CVM Vasco Heat 200 Solution Annealed**
Specs: **Steel & Alloy** **200** **Revised November 27, 1960**

SIZE

BARS

WEIGHT

HEAT No.

DATE SHIPPED

2-1/2" x 2-1/4" x 22-1/2"
12 pcs.

500#

2027-A

1/22/70

Labeling: 1 Tonella Prescription / Point Temp. 1000° Thin 2 Heavy

No.	2027-A	2027-B
T.C. Test	33300	33300
V.C. Test	33300	33300
CT Test 0.2 Percent		
% Reduction	11.6	10.0
% Elongation	2.0	3.0

Accepted Re = 34.0

Acid Etch = Satisfactory to MIL-STD 410, S-2, R-2, C-2

Grain Size = 6.0

Ultrasonic Inspection = Satisfactory to Specs & MIL-STD 410
Revised November 27, 1960

Hardness Test

A		D		C		D		E	
Thin Heavy		Thin Heavy		Thin Heavy		Thin Heavy		Thin Heavy	
T	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	1	1

Pressure Tensile
K_{ts}

2T = 52.1, 49.9, 50.0
2D = 55.5, 57.2, 54.2

POOR ORIGINAL

Heat No.	Analysis										
	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
2027-A	.010	.03	.03	.003	.003				4.00	11.00	10.10
	Al .10	Ti 1.37		B .003	Cr .001			Ca .05 Added			

Sworn and subscribed to before me
this 2nd day of February, 1970:

Certified Correct

[Signature]
Notary Public
Hampers Hand, Virginia
Commission Expires Feb. 1, 1972

[Signature]
LABORATORY MANAGER

NUCLEAR SERVICE AND CONSTRUCTION COMPANY INC

INSPECTION REPORT

CH - Yes

CONTRACT NO.

104K

INSPECTION DATE

March 6, 1970

FORM 17

☐ SHOP

☐ INSTALLATION

☒ Receipt OTHER

CHARTING NO.

104K

FILE NO.

33.2.2'60'

SUBJECT

VASCO Steel

P. C. NO.

104K-7431-4

PROCEDURE NO.

33-1 (Procurement - Raw Materials)

DRAWING NO.	ITEM NO.	QTY.	DESCRIPTION AND INSPECTION REMARKS
	2	9	<p>VASCO Steel 9-1/4" x 8-1/8" x 22-1/8" Long. Heat Number 2147A</p> <p>NOTES:</p> <ol style="list-style-type: none"> 1. No defects noted. 2. All die stamped with heat numbers. 3. Material at N.K.S. & D.D. Co.

CDC:ccc

DISTRIBUTION:

TWK/AFC

Mr. Salevsky

DISTRIBUTION:

LMW

BPH

GSK

JLP/FILE

WRC

DISPOSITION OF MATERIAL

Satisfactory - Released

PREPARED BY: C. L. Croach

Sheet 1 of 1

DATE

March 5, 1970

VASCO

LATROBE, PA. 15650

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia 23607

Your Order No. 104N-7431-4 Part

Our Order No. V-251713

Brand: CVM Vasco Max 350 Solution Annealed
Spec: Stone & Webster NUS 214 Revised November 27, 1968

DATE SHIPPED

SIZE 8-1/8" x 9-1/4" x 22-1/8"
9 pcs.

WEIGHT

4395#

HEAT No.

2147-A

2/26/70

Longitudinal Tensile Properties Anneal Temp 950° Time 3 Hours

No.	18	3X
T.S. Psi	344100	337600
Y.S. Psi	338100	330900
Offset 0.2 Percent		
Reduction %	23.0	22.0
Elongation %	5.0	5.0

Annealed Rc - 34.3

Acid Etch - Satisfactory to MIL-STD 430, S-2, R-2, & C-2

Grain Size - 6.1

Ultrasonic Inspection - Satisfactory to Stone & Webster NUS-214
Revised November 27, 1968

Non-Metallic Ratios

	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
T	0	0	0	0	0	0	0	0	1 1/2	0
S	0	0	0	0	0	0	0	0	1 1/2	0

Fracture toughness will be reported at a later date.

Heat No.	Analysis										
	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
2147-A	.013	.03	.05	.005	.004				4.67	11.81	18.02
	Al .11	Ti 1.41		B .002		Zr .008		Ca .05 Added			

Sworn and subscribed to before me
this 2nd day of March, 1970:

Certified Correct

JOHN L. ANTON, Laboratory Manager
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D.C. 20540

LABORATORY MANAGER

SECTION -B-

Item - Vasco Clevis End
Dwg. - 11448-FM-53C, Item 2
No. Pcs. - 8
Heat No. 2027A, 2147A, 2143A

Raw Material
Purchase Order No. 104N-7431-4, Item 2
I.R. No. 33.8.3 (43) in Section H of NSC/5206
I.R. No. 33.8.3 (130) 104N/179

Machining
Purchase Order No. 104N-5849-4, Item 2
Shipyard Inspection Report

Ageing Chart No. EE-634

(Copy of heat chart in certification package dated June 12, 1970,
File No. NSC/5073, 104N/171)

ION REPORT

106 (REV. 11)

INSTALLATION

THE FOLLOWING MATERIAL HAS BEEN INSPECTED AND IS RELEASED FOR: SHIPMENT FROM YARD

EST	FINAL INSPECTION	NNS & DD CO. P.O. ORDER NO.	5248-V
AT	X53 MACHINE SHIP	DATE	5/19/70
COAST GUARD	NOT REQUIRED	SIGNED (ADSI)	NOT REQUIRED
ERATING COMPANY	LEAH SERVICE & CONSTR. CO.	SIGNED	H. S. [Signature]

IG NO.	ITEM NO.	NAME OF PART	NO. PARTS ON ORDER	NO. PARTS ACCEPTED TODAY	NO. PARTS STILL DUE																																																				
369 C	1	CLEVIS	48	8	32																																																				
	2	CLEVIS	48	8	32																																																				
	The ABOVE MATERIAL IS SATISFACTORY.																																																								
<table><tr><th colspan="2">ITEM 1</th><th colspan="2">ITEM 2</th></tr><tr><th>MS. NO.</th><th>HEAT NO.</th><th>MS. NO.</th><th>HEAT NO.</th></tr><tr><td>574</td><td>2133A</td><td>590</td><td>1243A</td></tr><tr><td>448</td><td>2041A</td><td>428</td><td>2027A</td></tr><tr><td>438</td><td>1971A</td><td>566</td><td>2147A</td></tr><tr><td>446</td><td>1971A</td><td>459</td><td>2027A</td></tr><tr><td>577</td><td>2133A</td><td>460</td><td>2027A</td></tr><tr><td>633</td><td>2175A</td><td>563</td><td>2147A</td></tr><tr><td>632</td><td>2175A</td><td>589</td><td>2143A</td></tr><tr><td>629</td><td>2175A</td><td>455</td><td>2027A</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>			ITEM 1		ITEM 2		MS. NO.	HEAT NO.	MS. NO.	HEAT NO.	574	2133A	590	1243A	448	2041A	428	2027A	438	1971A	566	2147A	446	1971A	459	2027A	577	2133A	460	2027A	633	2175A	563	2147A	632	2175A	589	2143A	629	2175A	455	2027A															
ITEM 1		ITEM 2																																																							
MS. NO.	HEAT NO.	MS. NO.	HEAT NO.																																																						
574	2133A	590	1243A																																																						
448	2041A	428	2027A																																																						
438	1971A	566	2147A																																																						
446	1971A	459	2027A																																																						
577	2133A	460	2027A																																																						
633	2175A	563	2147A																																																						
632	2175A	589	2143A																																																						
629	2175A	455	2027A																																																						

3 INSP.	REMARKS
3 INSP.	
<input type="checkbox"/> ORDER COMPLETED <input type="checkbox"/> ORDER NOT COMPLETED	<input checked="" type="checkbox"/> FINAL <input type="checkbox"/> SHOP
N.N. INSP. SIGNATURE	
[Signature]	

NUCLEAR SERVICE AND CONSTRUCTION COMPANY INC

SECTION REPORT

CM-YES

CONTRACT NO.

104N

INSPECTION DATE

4-15-70

SHOP ☐ INSTALLATION

☒ RECEIVED OTHER

CHARGE NO.

104N

FILE NO.

23.2.2(150)

ITEM NO.

104N-7431-4

PROCEDURE NO.

02-1 (PROCEDURE OF INSPECTION)

SCO STEEL

AWING NO.	ITEM NO.	QTY.	DESCRIPTION AND INSPECTION REMARKS
	2	5	VASCO STEEL 8 1/8" x 9 1/4" x 22 1/8" HEAT NO-2171A ON 4 pc " " - 2143A on 1 pc NO DEFECTS NOTED ALL STAMPED WITH HEAT NO. INSPECTED AT N. V. S. & D. D. CO.

DISTRIBUTION:

K/AFC

Salevsky

W

E

K

P/FILE

G

DISPOSITION OF MATERIAL

SATISFACTORY -

INSPECTOR

A. R. ...

DATE

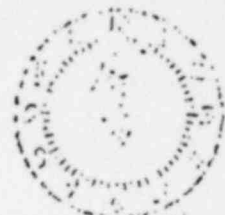
4-15-70



VASCO
LATROBE, PA. 15650

ANALYSIS REPORT

Nuclear Service & Construction Company
4101 Washington Avenue
Newport News, Virginia - 23607



SERVICE AND
TEST CO., INC.

stom:

ur Order No.

104N-7431-4 Part

ar Order No.

V-251713

and:

Consumable Vacuum Melted VascoMax 350 Solution Annealed
Spec: Stone & Webster NUS-214 Revised November 27, 1968
BARS WEIGHT HEAT No.

DATE SHIPPED

SIZE

1/8" x 9 1/2" x 22-1/8"

1 piece

4859

2143-A

4/1/70

Longitudinal Tensile Properties					Annealing Temp. 950° - 3 Hours	
Test No.	4T-MR1	4T-MR2	1B-MR1	1B-MR2		
Tensile Strength PSI	338300	336400	342100	342200		
Yield Strength PSI	335700	331200	326100	341600		
Offset 0.2 Percent	8.0	4.0	4.0	2.0		
Percent Reduction	1.0	1.0	1.0	1.0		
Percent Elongation						

Non-metallic Rating

	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
T.	0	0	0	0	0	0	0	0	3/4	1
B.	0	0	0	0	0	0	0	0	1 1/2	0

Annealed Hardness Rc - 34.9

Acid Etch - Satisfactory to Mil-Std 430, S-2, R-2, & C-2

Grain Size - 6.0

Ultrasonic Inspection - Satisfactory to Stone & Webster NUS 214
Revised November 27, 1968

Fracture toughness test results will be reported at a later date.

Heat No.	Analysis										
	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
2143-A	.014	.03	.03	.010	.004				4.66	11.96	18.13
	Al .14	Ti 1.38	B .002	Zr .003	Ca .05 Added						

Sworn and subscribed to before me
this 2nd day of April, 1970

Thomas A. McLean
THOMAS A. McLEAN, Notary Public
MONACA, CALIFORNIA, BEAVER COUNTY

Certified Correct

POOR ORIGINAL

William H. White
Supervisor - Finish Testing



VASCO
LATROBE, PA. 15650

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

Fracture Toughness Results
Additional Information

Order No. 104N 7431 4 Part

Order No. V-251713

Material: CVM Vasco Max 350 Solution Annealed

Spec: SAE & Webster MUS 214 Revised November 27, 1968

SIZE

BAR

WEIGHT

HEAT NO.

DATE SHIPPED

9-1/4" x 22-1/8"

11 pcs.

5401#

2143-A

3/6/70

Fracture Toughness Results

K_{IC}

4T - 35.5, 36.7, 35.6

1B - 39.7, 34.6, 33.2

Analysis

C

Si

Mn

S

P

W

Cr

V

Mo

Co

Ni

Witness and subscribed to before me

13th day of April, 1970

Certified Correct

POOR ORIGINAL

William H. White

SUPERVISOR - FINISH TESTING

THOMAS A. McLEAN, NOTARY PUBLIC
MONACA BOROUGH, DEAVER COUNTY
MY COMMISSION EXPIRES JULY 2, 1973

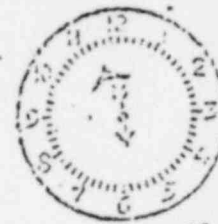


VASCO
LATROBE, PA. 15650

ANALYSIS REPORT

Nuclear Service & Construction Company
4101 Washington Avenue
Newport News, Virginia - 23607

UR 6 TO



SERVICE AND
FOR CO., INC.

Order No.

104N-7431-4 Part

Order No.

V-251713

and:

Consumable Vacuum Melted VascoMax 350 Solution Annealed.
Spec: Stone & Webster NUS 214 Revised November 27, 1968

SIZE

WEIGHT

HEAT No.

DATE SHIPPED

3" x 9 1/2" x 22-1/8"

4 pieces

19926

2171-A

4/1/70

Longitudinal Tensile Properties Aging Temp. 950° - 6 Hours				
Test No.	1B-MR1	1B-MR2	2X-MR1	2X-MR2
Tensile Strength PSI	353900	354000	346400	341800
Yield Strength PSI	344700	346300	339000	331600
Offset 0.2 Percent	27.0	25.9	27.3	20.4
Percent Reduction	5.5	5.5	5.0	4.5
Percent Elongation				

<u>Non-metallic rating</u>										
	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
T.	0	0	0	0	0	0	0	0	1	1 1/2
B.	0	0	0	0	0	0	0	0	1	0

Annealed Hardness Rc - 35.1

Acid Etch - Satisfactory to Mil-Std 430, S-2, R-2, & C-2

Grain Size - 6.0

Ultrasonic Inspection - Satisfactory to Stone & Webster NUS 214
Revised November 27, 1968

Fracture toughness test results will be reported at a later date.

Heat No.	Analysis									
	C	Si	Mn	S	P	W	Cr	V	Mo	Co Ni
171-A	.021	.02	.03	.005	.003				4.71	11.76 18.47
	Al .11	Ti 1.36	B .003	Zr .003	Ca .05 added					

Sworn and subscribed to before me
this 2nd day of April, 1970

THOMAS A. McLEAN, NOTARY PUBLIC

Certified Correct

POOR ORIGINAL

William N. White
Supervisor - Finish Testing

VASCO
LATROBE, PA. 15650

ANALYSIS REPORT

Customer: Nuclear Service & Construction Company
Newport News, Virginia

Fracture Toughness Results
Additional Information

Order No. 104N 7431 4 Part

Order No. V-251713

CVH Vasco Max 350 Solution Annealed
Spec. Steels & Webster NUS 214 Revised

November 27, 1968

HEAT No.

DATE SHIPPED

SIZE

DAKS

WEIGHT

2171-A

4/1/70

x 9" x 22-1/8" 4 pcs.

1992#

Fracture Toughness Results

K_{IC}

2X - 33.5, 35.3, 36.8

1B - 32.2, 31.0, 32.8

Analysis

C

Si

Mn

S

P

W

Cr

V

Mo

Co

Ni

orn and subscribed to before me

13th day of April, 1970:

Certified Correct

THOMAS A. McLEAN, NOTARY PUBLIC
MONACA BOROUGH, DEWEY COUNTY

SUPERVISOR - FINISH TESTING

SECTION A

Item - VASCO Pins

Drawing - 11446-FM-53C, Item 3

No. Pcs. - 8

Heat Nos. 1858A M.S.-610
1858A M.S.-603
1975A M.S.-614
1837A M.S.-597

Heat Nos. 1858A M.S.-592
1975A M.S.-617
1975A M.S.-616
1858A M.S.-605

Raw Material:

Purchase Order No. 104N-7431-4, Item 5

I.R. No. 33.8.3(13)

33.8.3(12) and (18) in Section J of NSC/5016, 104N/168

Purchase Order No. 104N-5849-18, Item 2

I.R. 33.8.3(74)A in Section J of NSC/5016, 104N/168

Machining:

Purchase Order No. 104N-5849-4, Item 3

I.R. No. 33.8.3(234)

Heat Chart No. B.H.-698

NUCLEAR SERVICE AND CONSTRUCTION COMPANY INC

CTION REPORT

2M - Yes

CONTRACT NO.

104N

INSPECTION DATE

January 7, 1970

CHARGE NO.

104N

FILE NO.

33.8.3(11)

☐ INSTALLATION

☒ Receipt OTHER

PROCEDURE NO.

33-1 (Procurement - Raw Materials)

P.O. NO.

104N-7431-4

TO Steel

AWING NO.	ITEM NO.	QTY.	DESCRIPTION AND INSPECTION REMARKS
	5	1	VASCO Steel (Machined), 17-5/16" x 20" x 27-5/8", Heat Number 1963A
	5	1	VASCO Steel (Machined), 17-1/4" x 19-15/16" x 27-1/2", Heat Number 1788A
	5	1	VASCO Steel (Machined), 17-3/8" x 20" x 27-3/8", Heat Number 1963A
++	5	1	VASCO Steel (Machined), 17-3/8" x 20" x 27-3/16", Heat Number 1837A, and 7ENX
	5	1	VASCO Steel (Machined), 17-3/8" x 20" x 27-5/8", *Heat Number 2001A
			*Heat Number tagged and painted on two sides with paint stick marker.
			Other four die stamped. Heat number stamped on block.
			++Dimension 27-3/16" should be 27-1/2", O.K. for release by W. Wells.
			Inspected at Newport News Shipbuilding and Dry Dock Company.

DC:ec

TRIBUTIONS

- ~~Stone~~ Mr. H. G. Solevsky
- Mr. T. W. Kilpatrick, Jr./JLP/File
- Mr. A. F. Ciannavei/LWM
- Mr. E. G. Adams/SWM
- Mr. B. P. Hill

1 - Mr. W. R. Graham

DISPOSITION OF MATERIAL

Satisfactory - Released

INSPECTOR

[Signature]

S.S.W.

DATE

January 9, 1970

CONTROL
ANCY REPORT

TWK/AFC

Mr. Salevsky

LWH

BPH

GSM

JLP/FILE

WRG

STANDARD PRACTICE

SPECIAL PRACTICE

CONTROLLED MATERIAL

FILE NO.

33.8.3 (234)

DR NO.

1041N-50

INSP. DATE

6/23/70

CONTRACT NO.

104105N

SITE

H.M.S. I.D.D. Co.

SUBJECT

VISCOS PINS



NSC PO/INS.



CONTR. FURN.



NAVY/GVT. FURN.

LIVING



INSTALLED



SHOP OR STORAGE

CONTRACTOR WITNESSED YES/NO

FACTORY BECAUSE OF:

S. (PINS) WERE DAMAGED AS DESCRIBED AND REPORTED BY H.M.S. I.D.D. Co.
 INSPECTION REPORT FILE NO. 00983 (ATTACHED).

IDENTIFICATION IN
TRAINING SHOP (N2.)

HEAT NO.

IDENTITY
(MATERIAL SHOP N1.)

HEAT NO.

MS-618 1975A
 MS-575 1873A
 MS-619 1975A
 MS-576 1858A

MS-604 1858A
 MS-601 1832A
 MS-650 1975A
 MS-571 1858A

Use Additional Sheets as Necessary

P.O. NO.	SERIAL NO.	DWG. NO.
1041-5449-4 (2A)	LISTED ABOVE	TH-52C-1
COMPONENT IDENT.	DATE	CHARGE NO.
LISTED ABOVE	6/23/70	

ACTION FOR RESOLUTION OF UNSATISFACTORY CONDITION:

2 attached sheets -

POOR ORIGINAL

CONCUR: 6/23/70 M. Schabert per TWX dated 6/24/70
 DATE

HAS BEEN COMPLETED SATISFACTORILY AS REQUIRED BY RESOLUTION ABOVE.

REPORT IS:



SELF-CLEARING



CLEARED



REMARKS BELOW

IKS:

PT AND UT TESTS WERE CONDUCTED ON
 EACH PIN. REPORTS ARE ATTACHED.
 DENTS AND CRACKS WERE GROUND OUT AND FILLED
 IN. REWORKED PINS WERE INSPECTED BY MR. SALEVSKY
 OF STONE AND WEGSTER.

CONJURING AUTHORITY

REPORT NO.

33.8.3 (234)

RESOLUTION FOR DR. 104D-50

6/24/70

1. PINS NOT VISIBLY DAMAGED:

- a. DYE PENETRANT AND ULTRASONIC TEST EACH PIN.
- b. REPORT ALL DEFECTS (PT OR ULTRASONIC) TO NSC FOR EVALUATION. PROVIDE CERTIFIED TEST REPORTS.

2. DENTED PINS (MS 501, 505, 604, 619, 620 AND 625):

- a. GRIND OUT DENTS AND FAIR IN AT A MINIMUM OF A 4:1 RATIO.
- b. AFTER GRINDING DYE PENETRANT AND ULTRASONIC TEST EACH PIN.
- c. REPORT ALL DEFECTS (PT OR ULTRASONIC) TO NSC FOR EVALUATION. PROVIDE CERTIFIED TEST REPORTS.

3. CRACKED PINS (MS 601 AND 618):

- a. SAME RESOLUTION AS #2 ABOVE. HOWEVER, IF CRACK CONTINUES BEYOND THE BOTTOM OF THE RETAINING RING ~~CRACK~~ GROOVE, SCRAP THE PIN AND REPLACE WITH A NEW PIN. NSC WILL FURNISH ADDITIONAL MATERIAL, IF REQUIRED.

4. ALL RE-WORKED PINS TO BE INSPECTED BY STONE & WEBSTER.

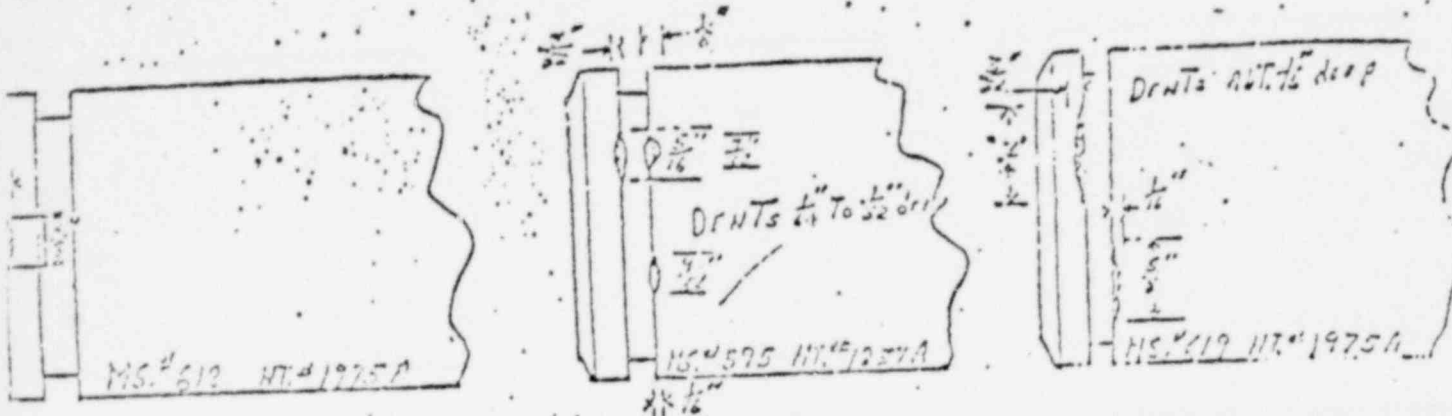
A. L. Lannan 6/24/70

Mr. M. Schuber per TWX dated 6/24/70 etc

FINDINGS

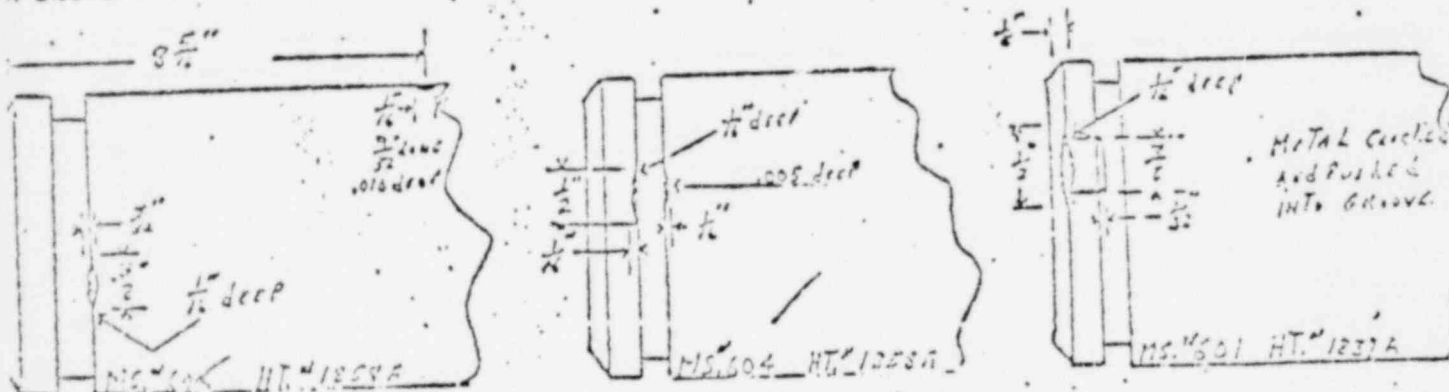
☐ SEE ATTACHMENT

DISCREPANCY



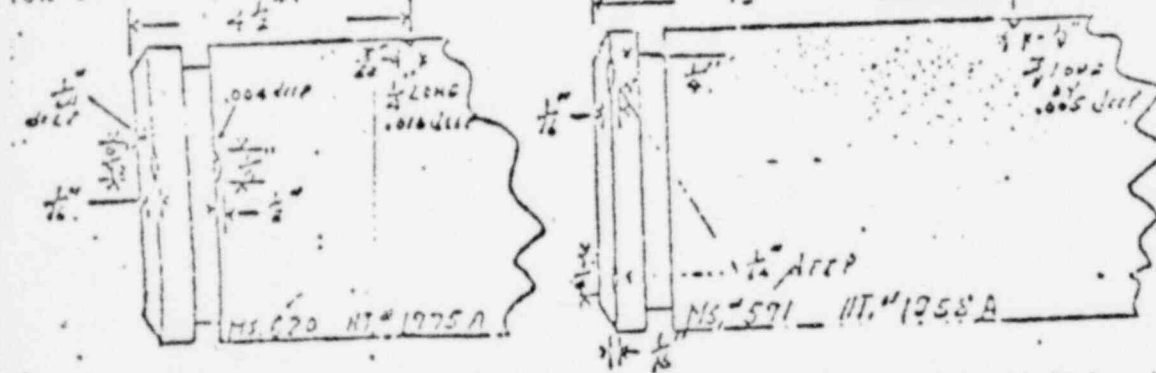
☐ SEE ATTACHMENT

IF DISCREPANCY



☐ SEE ATTACHMENT

IF DISCREPANCY



APPLICABLE REPAIR PROCEDURE

WELD

N.D.T.O.

SEE ADDITIONAL FORMS

☐ 155P

☐ 235P

☐ KETCH

☒ OTHER

Q/A COORDINATOR

CROSS REFERENCE

00923

ate EGA/JLP/JBH/TWK/File 104N.7

POOR ORIGINAL

U.T. OF VASCO PINS

AN ULTRASONIC INSPECTION WAS CONDUCTED ON 29 VASCO PINS USING THE FOLLOWING EQUIPMENT AND TEST METHOD.

INSTRUMENT - BRANSON SONORAY, MODEL 301

TRANSDUCER - $\frac{1}{2}$ " DIA. 3.5 MHz BRANSON T-RACES

COUPLANT - WATER SOLUBLE OIL (KUTWELL 40)

CALIBRATION STANDARD - A $3\frac{3}{4}$ " DIA. VASCO PIN

CONTAINING $\frac{1}{2}$ " DIA. AND $\frac{1}{4}$ " DIA. FLAT BOTTOM HOLES DRILLED $\frac{1}{2}$ " DEEP AND 1" DEEP RESPECTIVELY.

CALIBRATION PROCEDURE - THE REFLECTION FROM THE $\frac{1}{4}$ " DIA. FLAT BOTTOM HOLE WAS SET AT 90% OF FULL SCREEN. AT THIS GAIN SETTING THE SIGNAL FROM THE $\frac{1}{2}$ " DIA. HOLE WAS APPROXIMATELY 52% OF FULL SCREEN.

SCANNING - THE PINS WERE SCANNED 100% BOTH AXIALLY AND RADIALLY.

DEFECT EVALUATION - ANY DISCERNABLE FLAW INDICATION WAS TO BE EVALUATED BY NISC AND STONE AND WEBSTER, HOWEVER, NO FLAW INDICATIONS WERE FOUND.

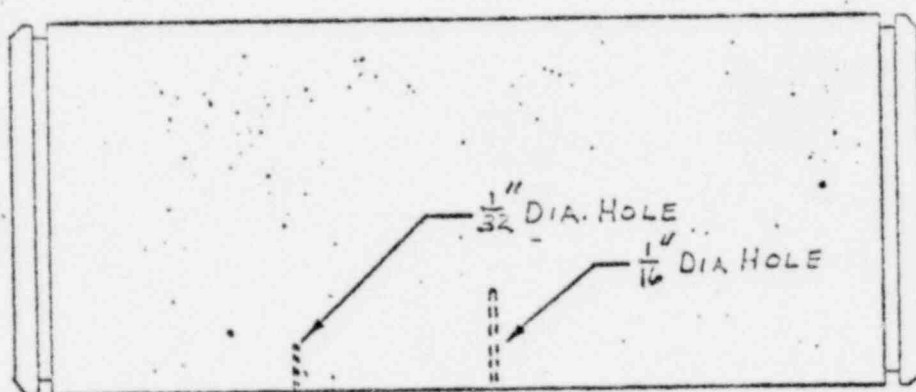
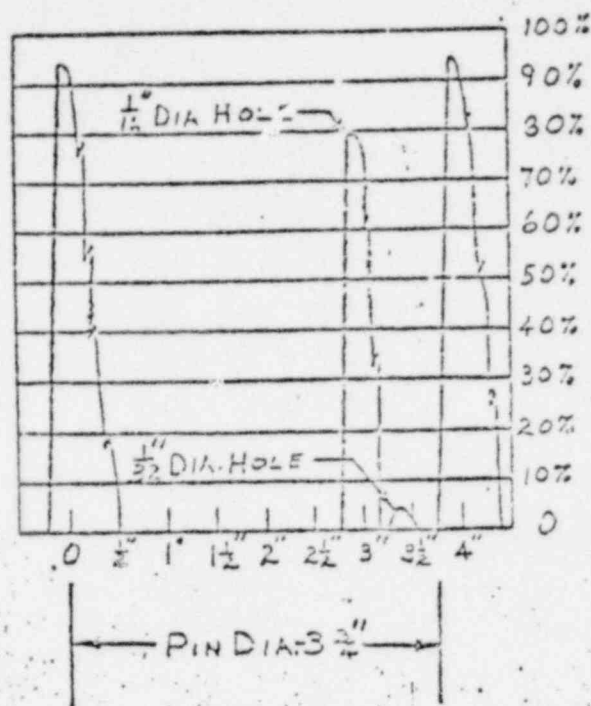
Notes (1) AT THE TEST SENSITIVITY LEVEL A $\frac{1}{4}$ " DIA. REFLECTOR SHOULD HAVE BEEN DETECTABLE. IT SHOULD BE NOTED THAT ALTHOUGH THE SIGNAL FROM THE $\frac{1}{2}$ " DIA. HOLE WAS ONLY 52% OF FULL SCALE, THIS WAS AT A DEPTH OF $3\frac{1}{4}$ ". ANY $\frac{1}{2}$ " DIA. REFLECTOR AT A DEPTH LESS THAN THIS WOULD HAVE YIELDED A SIGNAL LARGER THAN 52% AND SINCE THE PART WAS SCANNED 360°, ANY DEFECT SHOULD HAVE BEEN SEEN AT A DEPTH OF NO MORE THAN $\frac{1}{2}$ THE DIA. OF THE PIN OR 1 7/8".

(2) THE NOISE LEVEL VARIED FROM 10% TO 40% IN SOME OF THE PINS AND PREVENTED THE USE OF A HIGHER TEST SENSITIVITY. HOWEVER, THE NOISE LEVEL VARIED, IT FOLLOWED A PATTERN THAT WOULD HAVE ALLOWED DISCONTINUITIES WITH

POOR ORIGINAL

500000. AMPLITUDES LOWER THAN THE NOISE LEVEL TO BE DETECTED. THE VARIATION IN THE NOISE LEVEL APPEARED TO BE CAUSED BY SILENT VARIATIONS IN THE MICROSTRUCTURE OF THE PWS.
- (3) A TRANSDUCER OF A LOWER FREQUENCY ($\frac{1}{2}$ " DIA - 2.25 MHz) WAS TRIED IN AN ATTEMPT TO REDUCE THE NOISE LEVEL. THE NOISE LEVEL WAS REDUCED, HOWEVER THE $\frac{1}{2}$ " DIA HOLE COULD NOT BE SEEN AT THIS FREQUENCY. THEORETICALLY THE SMALLEST DETECTABLE FLAW IS $\frac{1}{2}$ THE WAVELENGTH. $\frac{1}{2}$ THE WAVELENGTH OF A 2.25 MHz TRANSDUCER IS APPROX. .050". THIS EXPLAINS THE INABILITY TO DETECT A .0315" DIA FLAT BOTTOM HOLE.
- (4) THE BAR COULD NOT BE PENETRATED WITH A 5.0 MHz TRANSDUCER WITH ENOUGH POWER TO RESOLVE THE $\frac{1}{2}$ " DIA HOLE.

POOR ORIGINAL



U.T. CALIBRATION STANDARD

INSPECTION REPORT REV. 11

THE FOLLOWING MATERIAL HAS BEEN INSPECTED AND IS RELEASED FOR: SHIPMENT FROM YARD

INSTALLATION

EST	DYE PENETRANT	WNS & CO. CO. P.O. ORDER NO.	5218-V
INT	X-53 MACHINE SHOP	DATE	6/29/70
U.S. COAST GUARD	NAT REQUIRED	SIGNED (AUS)	NOT REQUIRED
OPERATING COMPANY	U.S. COAST GUARD SERVICE & CONSTR. CO.	SIGNED	U.S. COAST GUARD

OPERATING COMPANY

UCLAM SERVICE + CONST. Co. H.S.C. - C.P.R.

ING NO.	ITEM NO.	NAME OF PART	NO. PARTS ON ORDER	NO. PARTS ACCEPTED TODAY	NO. PARTS STILL DUE																																																																								
69	3	PIN																																																																											
D		DYE PENETRANT CHECK OF 31 PINS, M.S. No. + HEAT No. LISTED BELOW, WAS SATISFACTORY. THIS INCLUDES THE PINS THAT WERE DAMAGED WHEN DROPPED. THE DEFECTS WERE GROUND OUT AND POLISHED.																																																																											
		<table><thead><tr><th colspan="2">ITEM # 2</th><th colspan="2">ITEM # 3</th></tr><tr><th>M.S. No.</th><th>HEAT No.</th><th>M.S. No.</th><th>HEAT No.</th></tr></thead><tbody><tr><td>593</td><td>1837A</td><td>600</td><td>1837A</td></tr><tr><td>610</td><td>1858A</td><td>612</td><td>1975A</td></tr><tr><td>609</td><td>1858A</td><td>607</td><td>1858A</td></tr><tr><td>616</td><td>1975A</td><td>613</td><td>1975A</td></tr><tr><td>596</td><td>1837A</td><td>615</td><td>1975A</td></tr><tr><td>599</td><td>1837A</td><td>608</td><td>1858A</td></tr><tr><td>617</td><td>1975A</td><td>540</td><td>2017A</td></tr><tr><td>597</td><td>1837A</td><td>601</td><td>1837A</td></tr><tr><td>611</td><td>1975A</td><td>606</td><td>1858A</td></tr><tr><td>598</td><td>1837A</td><td>604</td><td>1858A</td></tr><tr><td>547</td><td>1858A</td><td>618</td><td>1975A</td></tr><tr><td>602</td><td>1837A</td><td>619</td><td>1975A</td></tr><tr><td>614</td><td>1975A</td><td>595</td><td>1837A</td></tr><tr><td>592</td><td>1858A</td><td>620</td><td>1975A</td></tr><tr><td>603</td><td>1858A</td><td>591</td><td>1858A</td></tr><tr><td>605</td><td>1858A</td><td></td><td></td></tr></tbody></table>	ITEM # 2		ITEM # 3		M.S. No.	HEAT No.	M.S. No.	HEAT No.	593	1837A	600	1837A	610	1858A	612	1975A	609	1858A	607	1858A	616	1975A	613	1975A	596	1837A	615	1975A	599	1837A	608	1858A	617	1975A	540	2017A	597	1837A	601	1837A	611	1975A	606	1858A	598	1837A	604	1858A	547	1858A	618	1975A	602	1837A	619	1975A	614	1975A	595	1837A	592	1858A	620	1975A	603	1858A	591	1858A	605	1858A					
ITEM # 2		ITEM # 3																																																																											
M.S. No.	HEAT No.	M.S. No.	HEAT No.																																																																										
593	1837A	600	1837A																																																																										
610	1858A	612	1975A																																																																										
609	1858A	607	1858A																																																																										
616	1975A	613	1975A																																																																										
596	1837A	615	1975A																																																																										
599	1837A	608	1858A																																																																										
617	1975A	540	2017A																																																																										
597	1837A	601	1837A																																																																										
611	1975A	606	1858A																																																																										
598	1837A	604	1858A																																																																										
547	1858A	618	1975A																																																																										
602	1837A	619	1975A																																																																										
614	1975A	595	1837A																																																																										
592	1858A	620	1975A																																																																										
603	1858A	591	1858A																																																																										
605	1858A																																																																												

EDITION

REMARKS	<p>X-53 INSP.</p> <p>X-52 INSP.</p> <p>U.S.C.</p> <p>STAMPED</p>
<input type="checkbox"/> ORDER COMPLETED <input type="checkbox"/> ORDER NOT COMPLETED	<input type="checkbox"/> FINAL <input type="checkbox"/> SHOP <p>N.H. INSP. SIGNATURE</p> <p><i>[Signature]</i></p>

SECTION J

Item - Vasco Pins

Drawing - 11448-FM-530, Item 3

No. Pcs. - 8

Heat No. - 2 Pcs (2019A); 6 Pcs. (1859A)

Raw Material - NSC Purchase Order 104N-7433-4 (Item 5)
I.R. No. 33.8.3 (10) and (12)

Preout Blocks - NSC Purchase Order 104N-5849-18 (Item 2)
I.R. No. 33.8.3(74A)

Machining (Blocks) - NSC Purchase Order 104N-5849-18 (Item 1)
I.R. No. 33.8.3(74A)

Machining to Dim. - NSC Purchase Order 104N-5849-4 (Item 3a)
I.R. No. 33.8.3(179)

Ageing/Heat Treat
Heat Chart No. BH-693

POOR ORIGINAL

Section J

NUCLEAR SERVICE AND CONSTRUCTION COMPANY INC

SECTION REPORT

CM - Yes

CONTRACT NO.

104N

INSPECTION DATE

January 16, 1970

SHOP



INSTALLATION



Receipt OTHER

CHARGE NO.

104N

FILE NO.

33.8.3(17)

JECT

VASCO Steel

P. O. NO.

104N-7431-4

PROCEDURE NO.

33-1 (Procurement - Raw Materials)

DRAWING
NO.

ITEM
NO.

QTY.

DESCRIPTION AND INSPECTION REMARKS

5

3

VASCO 300, Annealed, 260,000 psi Minimum Yield

- 1 Pc. - 27-7/16" x 19-7/8" x 17-3/8", Heat Number 2019A
- 1 Pc. - 27-1/2" x 19-7/8" x 17-3/8", Heat Number 1975A
- 1 Pc. - 27-3/8" x 19-7/8" x 17-3/8", Heat Number 1975A

NOTES:

1. No deficiencies noted.
2. Material die stamped with heat number.
3. Inspected at MacTavish.

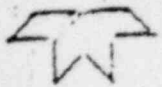
RM:ecc

DISTRIBUTION:

- 1 - Stone & Webster/Mr. Solenski
- 1 - MacTavish Machine
- 1 - Mr. T. W. Kilpatrick, Jr./JLP/Filo
- 1 - Mr. D. P. Hill
- 1 - Mr. W. R. Graham
- 1 - Mr. L. W. Wells
- 1 - Mr. A. F. Ciannavei
- 1 - Mr. E. G. Adams

DISPOSITION OF MATERIAL

Satisfactory - Released



A TELETYPE COMPANY

VASCO

LATRODE, PA. 15650

FORM VASCO 304-2 10

ANALYSIS REPORT

Customer: Nuclear Service & Construction Co.
Newport News, Virginia

Your Order No. 10444-7431-24

Our Order No. V-751716

Brand: CVN Vasco Max 300 Solution Annealed Spec: Stone & Webster NUS-193

SIZE	BARS	WEIGHT	HEAT No.	DATE SHIPPED
1 1/4" x 19-3/4" x 27-1/4"	2 pcs	5499#	1275-A	1/5/70

Longitudinal Tensile Properties - Yield Temp. 900° Time 6 HOURS

No.	30-IR1	30-IR2	30MX-IR1	30MX-IR2
T.S. Psi	281100	201100	201100	200100
Y.S. Psi	273600	273600	273100	273100
Offset 0.2 Percent				
Reduction %	28.7	29.3	31.9	28.1
Elongation %	5.0	5.0	6.0	5.5

Annealed Rc = 30.7

Acid Etch - Satisfactory to MIL-STD 430, S-2, R-2, & C-2

Grain Size = 6.6

Ultrasonic Inspection - Satisfactory to MIL-I-8950A - Modified per Stone & Webster
NUS-193 Revised November 27, 1960NON-METALLIC RATING

	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
T	0	0	0	0	0	0	1	0	1	1/2
B	0	0	0	0	0	0	0	0	1	1

Fracture Toughness will be reported at a later date.

Heat No.	Analysis										
	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
1275-A	.020	.030	.030	.005	.005				4.78	9.00	18.07
	Al .10	Ti .65	B .003	Zr .012	Ca .05	Added					

Sworn and subscribed to before me
this 24th day of January, 1970:

NOTARY PUBLIC JOHN J. LATH, NOTARY PUBLIC
HARRISBURG, PENNSYLVANIA - DEWITT COUNTY

Certified Correct

LABORATORY MANAGER

POOR ORIGINAL



VASCO
LATRODE, PA. 15650

FORM VISC 30M-3-69

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

Additional Information
Fracture Toughness Results

Your Order No. 10411-7431

Our Order No. V-251716

Brand: CVN Vasco Max 300 Solution Annealed

Spec: Stone & Webster NUS 158

SIZE BARS

WEIGHT

HEAT No.

DATE SHIPPED

1/4" x 19-3/4" x 27-1/4"
2 pos.

5499H

1975-A

1/5/70

Fracture Toughness
K_{IC}

3B - 64.4, 64.4, 62.2
3BM - 65.9, 69.2, 71.9

Heat No. C Si Mn S P W Cr V Mo Co Ni

Analysis

Sworn and subscribed to before me
this 22nd day of January, 1970:

Certified Correct

POOR ORIGINAL

James S. Searles
LABORATORY MANAGER

JOHN L. ROSS, Notary Public
MONROE COUNTY, ALABAMA
JAN 23 1970



VASCO
LATROBE, PA. 15650

FORM V184C 20M-1-67

ANALYSIS REPORT

Customer: Nuclear Service & Construction Co.
Newport News, Virginia

Your Order No. 10420/421-1

Our Order No. V-251716

Material: CVN Vasco Max 300 Solution Annealed
Special Steels & Metals NUS-193
SIZES WEIGHT

HEAT No.

DATE SHIPPED

1 1/4" x 19-3/4" x 27-1/4"
1 pc.

2746H

2019-A

1/5/68

Longitudinal Tensile Properties Anneal Temp. 900° Time 6 Hours

	3-1	3-2	3X-1	3X-2
Hot				
T.S. Psi	203500	207000	205700	204700
Y.S. Psi	204400	202700	200300	279600
Offset 0.2 Percent				
Reduction %	34.0	37.0	37.0	37.0
Elongation %	7.0	7.5	7.5	8.5

Annealed Rc = 31.1

Acid Etch = Satisfactory to MIL-STD 430, S-2, R-2, & C-2

Grain Size = 6.2

Ultrasonic Inspection = Satisfactory to MIL-I-9950a - Modified per
Steno & Webster NUS-190 Revised November 27, 1963

Non-Metallic Rating

	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
T	0	0	0	0	0	0	0	0	3/4	1 1/2
B	0	0	0	0	0	0	0	0	1	2

Fracture Toughness will be reported at a later date.

POOR ORIGINAL

Analysis

Heat No.	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
2019-A	.020	.04	.02	.005	.005				4.84	9.03	19.46
	Al .09		Ti .63	B .004		Zr .011		Ca .05 Added			

Sworn and subscribed to before me
this 2th day of January, 1970:

Certified Correct

John J. Smith
JOHN J. SMITH, Notary Public

James J. [Signature]
LABORATORY MANAGER

ANALYSIS REPORT

Customer: Harbort Service & Construction Co.
 Newport News, Virginia

Our Order No. 100017491-4

or Order No. 100017491

and: CVM Vasco Max 300 Solution Annealed

Spec: STONE WHEELER 400-197

SIZE	BARS	WEIGHT	HEAT No.	DATE SHIPPED
1/4" x 3/8" x 1/4"	2 pcs.	5.000	1975-A	1/2/75

Longitudinal Tensile Properties: Anneal Temp. 900° Time 6 HRS

No.	30-MR1	30-MR2	30XK-MR1	30XK-MR2
T.S. Psi	281100	281100	281100	280100
Y.S. Psi	272600	272600	273100	273100
Offset 0.2 Percent				
Reduction %	23.7	29.3	31.9	23.7
Elongation %	5.0	5.0	6.0	5.5

Annealed Rc = 30.7

Acid Etch = Satisfactory to MIL-STD-400, C-2, R-2, & C-2

Grain Size = 6.6

Ultrasonic Inspection = Satisfactory to MIL-STD-1050A - Modified per Stone & Webster
 NBS-190 Revised November 27, 1969

NON-METALLIC RATING

A		D		C		B		E	
Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
0	0	0	0	0	0	1	0	1	1/2
0	0	0	0	0	0	0	3	1	1

Fracture Toughness will be reported at a later date.

Analysis

wt %	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
HA	.020	.030	.030	.005	.035				4.70	2.00	10.07
	Al .10	Ti .65		B .003		Zr .012	Ca .05 Added				

Worn and subscribed to before me

is: January 1, 1970

Certified Correct

JOHN J. ANTO, NOTARY PUBLIC
 NOTARY PUBLIC - HENRICH, HENRICH COUNTY
 BY COMMISSION EXPIRES FEB. 1, 1972

LABORATORY MANAGER

POOR ORIGINAL

Customer: Nuclear Service & Construction Co.
Newport News, Virginia

Order No. 101057551-4

Order No. V-65773

Material: GUN Vasco Van 300 Solution Annealed
Specs: Specs & Methods: NUC-100
BARS WEIGHT

HEAT No.

DATE SHIPPED

Size: 12.5/16" x 37.5/16"
1 pc.

27162

2019-A

1/1/70

Longitudinal Tensile Properties Analysis Table, 300° Film & Heavy

No.	3-1	3-2	3-1	3-2
Y.S. Ref	203500	207000	205700	204700
Y.S. Ref	204400	202700	200000	209000
Offset 0.2 Percent				
Reduction %	34.0	37.0	37.0	37.0
Elongation %	7.0	7.5	7.5	8.5

Annealed Re = 37.5

Add Spec & Satisfactory to NUC-STD 400, C-2, R-2, & C-2

Grain Size = 6.2

Ultrasonic Inspection & Satisfactory to NUC-STD 400 - Modified per
Specs & Methods: NUC-100 Revised November 27, 1960

Non-Metallic Defects

	A	B	C	D	E
	Thin Heavy	Thin Heavy	Thin Heavy	Thin Heavy	Thin Heavy
T	0	0	0	0	3/4
D	0	0	0	0	2

Fracture Toughness will be reported at a later date.

POOR ORIGINAL

Test No.	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
2019-A	.020	.04	.02	.003	.003				4.04	0.03	10.46
	As .02		79 .03		D .004	Zr .001		Co .05 Added			

Sworn and subscribed to before me
At City of January, 1970:

Certified Correct

JOHN L. RYAN, Notary Public
NOTARY PUBLIC HONORARY COMMISSION, DEWATER COUNTY
My Comm. Exp. 1-1-72

LABORATORY MANAGER

MATERIAL CHECK AND INSPECTION REPORT

SECTION REPORT		CH - Yes	CONTRACT NO. 104N	INSPECTION DATE December 23, 1969
17	<input type="checkbox"/> INSTALLATION	<input checked="" type="checkbox"/> Proceed OTHER	CHANGE NO. 104N	FILE NO. 33.8.5 (12)
SHOP		P.C. NO. 104N-7431-B		
LOT		PROCEDURE NO. 33-1 (Procurement - Raw Materials)		
Vasco Steel				

DRAWING NO.	ITEM NO.	QTY.	DESCRIPTION AND INSPECTION REMARKS
	5	2	Vasco Steel (Machined), 19-3/4" x 17-3/4" x 27-1/4", Heat Number 2957A
	2	5	Vasco Steel (Machined), 9-1/4" x 8-1/8" x 22-3/8", Heat Number 2957A
<p>NOTES:</p> <ol style="list-style-type: none"> 1. No deficiencies noted. 2. Material die stamped with heat number. 3. Inspection at Newport News Shipbuilding and Dry Dock Company. 			

SRM:ccc

POOR ORIGINAL

DISTRIBUTION:

- 1 - Mr. Selenski/Stone & Webster
- 1 - Mr. T. W. Kilpatrick, Jr./JLP/File
- 1 - Mr. B. P. Hill
- 1 - Mr. A. F. Ciannavol
- 1 - Mr. L. S. Wells
- 1 - Mr. S. R. McCraw

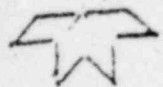
DISPOSITION OF MATERIAL

Satisfactory - Released

REINSPECTOR

DATE

January 8, 1970



A TELETYPE COMPANY

VASCO
LATROBE, PA. 15650

FORM VISC 10W-2 11

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock
Newport, News, Virginia

Your Order No. 104N-7431-4-Balances (5)

Our Order No. V-25716 #3

Brand: GVM Vasco Max 300 Solution Annealed
Spec: Stone & Webster NUS 193 Revised November 27, 1968

SIZE

1/4" x 19-3/4" x 27-1/4"

2 pcs.

WEIGHT

5530W

HEAT No.

1058-A

DATE SHIPPED

12/16/69

Longitudinal Tensile Properties - Anneal Temp 900° Time 3 Hours

No.	50-MAX	50-MAX
T.S. Psi	293200	280300
Y.S. Psi	274500	272600
Offset 0.2 Percent		
% Reduction	33.5	28.0
% Elongation	7.0	6.0

Annealed Rc = 30.7

Acid Etch - Satisfactory to MIL-STD 430, S-2, R-2, & C-2

Grain Size = 6.0

Ultrasonic Inspection - Satisfactory to MIL-I-0950A - Modified per Stone & Webster NUS-193 Revised November 27, 1968

		Non-Metallic Rating									
		A		B		C		D		E	
		Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
Top		0	0	0	0	0	0	0	0	2	2
Bottom		0	0	0	0	0	0	0	0	1	1

Fracture Toughness will be reported at a later date.

POOR ORIGINAL

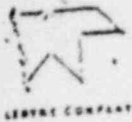
Heat No.	Analysis						Cr	V	Mo	Co	Ni
	C	Si	Mn	S	P	W					
1058-A	.006	.02	.02	.007	.004				4.83	8.93	10.48
	Al .09	Ti .59	B .004	Zr .003	Ca .05 Added						

Sworn and subscribed to before me
this 19th day of December 1969:

Certified Correct

[Signature]
MANAGER

NOTARY PUBLIC



VASCO
LATROBE, PA. 15650

FORM VASCO 100-1-19

ANALYSIS REPORT

Customer:

Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

Additional Information
Fracture Toughness Results

our Order No. 104K-7431-4 Balance

ur Order No. V-251716 #3

and: CVN Vasco Max 300 Solution Annealed
Spec: SAE & Webster 100 Revised November 27, 1968
SIZE WEIGHT HEAT No.

DATE SHIPPED

1" x 19-3/4" x 27-1/4"
2 pcs.

5538#

1858-A

12/16/69

Fracture Toughness
K_{IC}

53 - 61.1, 66.0, 67.9
58MX - 61.5, 69.0, 65.6

Heat
No.

C

Si

Mn

S

P

W

Cr

V

Mo

Co

Ni

Analysis

POOR ORIGINAL

Sworn and subscribed to before me

this 22nd day of January, 1970:

Certified Correct

[Signature]

[Signature]



VASCO
LATROBE, PA. 15650

FORM VIBAC 30M 1-67

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock
Newport News, Virginia

Your Order No. 1044-7431-4 Part ②

Our Order No. V.251713 Part

Brand: CVI Vasco Max 350 Solution Annealed
Spec: Stone & Webster HUS 214 Revised November 27, 1969
SIZE: 1/8" x 9-1/4" x 22-1/2" WEIGHT: 2467# HEAT No. 1967-A

DATE SHIPPED

1/8" x 9-1/4" x 22-1/2"

5 pcs.

2467#

1967-A

12/16/69

Longitudinal Tensile Properties Anneal Temp 950° Time 3 Hours

No.	10-1	10X-1
T.S. Psi	341100	339200
Y.S. Psi	336000	330900
Offset 0.2 Percent		
% Reduction	19.0	17.0
% Elongation	3.5	2.5

Annealed Re - 34.1

Acid Etch - Satisfactory to MIL-STD 430, S-2, R-2, & C-2

Grain Size - 6.0

Ultrasonic Inspection - Satisfactory to Stone & Webster HUS-214
Revised November 27, 1969

	<u>Non-Metallic Rating</u>									
	A		B		C		D		E	
	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
Top	0	0	0	0	0	0	0	0	1½	1½
Bottom	0	0	0	0	0	0	0	0	1	½

Fracture Toughness will be reported at a later date.

Heat No.	Analysis										
	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
1967-A	.011	.03	.03	.006	.004				4.74	11.64	18.46
	Al .11	Ti 1.45		B .003		Zr .010		Ca .05 Added			

Sworn and subscribed to before me
this 19th day of December, 1969:

Notary Public

JOHN J. MITCHELL, Notary Public
MONROE COUNTY, GEORGIA
COMMISSION EXPIRES FEB. 1, 1972

Certified Correct

POOR ORIGINAL

Laboratory Manager



VASCO
LATROBE, PA. 15650

FORM VASCO 10-1-69

(2)

ANALYSIS REPORT

Customer: Newport News Shipbuilding & Dry Dock Company
Newport News, Virginia

Additional Information
Fracture Toughness Results

our Order No. 104N-7431-4

for Order No. V-251713

Material: CV: Vasco Max 350 Solution Annealed
Spec: Stone & Webster HUS 214 Revised November 27, 1968

SIZE	BARS	WEIGHT	HEAT No.	DATE SHIPPED
3" x 9-1/4" x 22-1/0"				
5 pcs.	2467#		1967-A	12/16/69

Fracture Toughness
K
IC

1B - 35.7, 35.9, 36
1BX - 38.6, 36.2, 37.6

Heat No.	C	Si	Mn	S	P	W	Cr	V	Mo	Co	Ni
----------	---	----	----	---	---	---	----	---	----	----	----

Sworn and subscribed to before me
this 22nd day of January, 1970:

JOHN J. NUTH, NOTARY PUBLIC
STATE OF VIRGINIA

Certified Correct

POOR ORIGINAL

SURRY POWER STATION
VIRGINIA ELECTRIC AND POWER COMPANY

APPENDIX A

30010-P-2-112

[illegible]

POOR ORIGINAL

CONTROLLING PROCEDURE:

1.0 PURPOSE

The purpose of this procedure is to describe the means by which the RC Pump and Pressurizer Supports shall be nondestructively examined to verify their compliance with the original design.

Initials Date

2.0 INITIAL CONDITIONS

2.1 Cleanliness requirements of Attachment I are met.

2.2 RWP obtained. RWP No. _____

2.3 Lighting available.

2.4 Electrical power and magnetic particle inspection and visual inspection materials are available (Daniel Procedure QCP-303 and WF-A-0-77-75).

3.0 PRECAUTIONS

(To be signed off prior to commencing work.)

3.1 During cleaning of the castings and supports, do not scratch or gouge the metal surfaces or coating. When cleaning with a liquid, use only hot water with Syla and Span or Alcohoh.

4.0 INSTRUCTIONS

(Perform the visual inspection prior to the magnetic particle inspection. The other steps may be completed in any order, as necessary.)

4.1 Perform a complete visual inspection of all the supports listed in Table 1. Visual examination shall be performed in accordance with Daniel Procedure No. QCP-303, Rev. 1 and the requirements of Section 7 of the ASME Code, Paragraph T293 and/or Section XI of the ASME Code, Paragraph UW-2210. A description of the specific methods to be used is as follows:

A. Direct Visual Method:

For this method, the eye must be placed within 24 inches of the surface to be examined and at an angle no less than 30 degrees with the surface to be examined.

POOR ORIGINAL

CONTROLLING PROCEDURE:

Initials Date

E. Remote Visual Method:

This method may be used where conditions exist that do not permit direct visual examination. In this method, use is made of visual aids such as telescopes, periscopes, boroscopes, fiber optics, or TV cameras and monitoring systems.

C. Lighting:

For Section V of the code, the area subject to examination shall have a minimum of 15-foot candles (160 lux) for general examination and a minimum of 50-foot candles (540 lux) for detection of small indications. For Section XI of the code, the light shall be sufficient to resolve a 1/32" black line on the surface or a similar surface to that being examined. Mirrors may be used to improve the angle of vision which is not to be less than 30 degrees with the surface to be examined. Welds in components being inspected shall be examined by using the direct or remote visual methods as described in Section 4.1 - A or 4.1 - B. Examinations shall include the weld and the adjacent base metal for at least one thickness on each side of the weld.

D. Studs and Nuts:

Studs, nuts, bolts, and washers shall be examined in place. In-place-examination shall consist of checking for tightness and all exposed surfaces of threads, nuts, etc., shall be examined to insure they are free of cuts, cracks, or oxidation.

4.1.1 Acceptance criteria for welds is included in Daniel Procedure QCP-505. Component surfaces other than welds shall be free of cuts, cracks, or oxidation.

4.1.2 Initial and date Table 1 as each component is visually inspected. Also, note on Table 1 under "Remarks" whether the component inspected is satisfactory or unacceptable.

POOR ORIGINAL

CONTROLLING PROCEDURE:

Initials	Date
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4.2 Perform a magnetic particle inspection of the components listed in Table 2, as well as any suspect areas found during the inspection. Perform the magnetic particle inspection in accordance with Daniel Procedure No. MT-A-C-77-VS, Revision 0.

4.2.1 Acceptance criteria for all surfaces shall be as defined in Daniel Procedure No. MT-A-C-77-VS, Revision 0.

4.2.2 Initial and date Table 2 as each component is magnetic particle inspected. Also note on Table 2 under "Comments" whether the component inspected is satisfactory or unsatisfactory.

4.3 The items listed in Table 3 are units of Macconax and are to be visually inspected for coating integrity using the procedure in Appendix A.

4.3.1 Acceptance criteria shall be as noted in the procedure in Appendix A.

4.3.2 Initial and date Table 3 as each component is inspected. Also note on Table 3 under "Comments" whether the component inspected is satisfactory or unsatisfactory.

Completed by _____

DATE _____

POOR ORIGINAL

STEAM GENERATOR REPLACEMENT

Recommended Approval: _____

Date: _____

Reviewed By: _____

Date: _____

Approved By: _____

Chairman, Station Nuclear Safety, and
Operating Committee

Date: _____

List of Effective Revisions:

Section

Date

Attachments

POOR ORIGINAL

APPENDIX A

PROCEDURE FOR VERIFYING CONTINUITY OF PERESITE VR-514 PHENOLIC COATING FOR VASCOMAX BOLTS

PURPOSE — The purpose of this procedure is to establish a means of inspection with a low-voltage, non-sparking holiday detector device, the coating applied to Vascomax material.

INSPECTION DEVICE — Use a Tinker & Eisco Model M/I Holiday Detector which utilizes a 6.75-V battery as a source of current. The current is imposed upon the surface to be inspected by a means of a sponge-type probe. A film discontinuity causes a flow of current to "ground" which causes an audible sound to be emitted from the annunciator box.

TEST METHOD — Any freshly applied coating shall have been dried at least 24 hours prior to testing. One hundred percent (100%) of the surface area which is physically accessible to the sponge probe shall be checked.

The procedure for assembling and operating the "T/E" shall be as set forth in Attachment I. A wetting agent, such as "Farnona 100" by Dow Corning Corporation or Photo Flo-200 by Eastman Kodak, shall be added to the water used to wet the sponge to enhance the sensitivity (the latter product is available from most photographic services agencies). Periodically inspect the ground to ensure that the unit is properly grounded; this can be accomplished by intentionally placing the probe on an obvious discontinuity or a grounded, uncoated conductive metal surface. An audible signal indicates a coating flaw. Turn the sponge or end, using the corner only, to zero on a suspected flaw.

When a pinhole is located, the flaw shall be designated by encircling with chalk or a comparable, easily removable marking.

ACCEPTANCE CRITERIA — Any discontinuities shall be referred to Engineering for evaluation and disposition.

POOR ORIGINAL

APPENDIX A

PROCEDURE FOR
VERIFYING CONTINUITY OF MERESITE VR-514
PHENOLIC COATING FOR VASCOMAX BOLTS

PURPOSE — The purpose of this procedure is to establish a means of inspection with a low-voltage, non-sparking holiday detector device, the coating applied to Vascomax material.

INSPECTION DEVICE — Use a Tinker & Rascoe Model M/I Holiday Detector which utilizes a 6.75-V battery as a source of current. The current is imposed upon the surface to be inspected by a means of a sponge-type probe. A film discontinuity causes a flow of current to "ground" which causes an audible sound to be emitted from the annunciator box.

TEST METHOD — Any freshly applied coating shall have been dried at least 24 hours prior to testing. One hundred percent (100%) of the surface area which is physically accessible to the sponge probe shall be checked.

The procedure for assembling and operating the "M/I" shall be as set forth in Attachment I. A wetting agent, such as "Wetters 100" by Dow Corning Corporation or Photo Flo-200 by Eastman Kodak, shall be added to the water used to wet the sponge to enhance the sensitivity (the latter product is available from most photographic services agencies). Periodically inspect the ground to ensure that the unit is properly grounded; this can be accomplished by occasionally placing the probe on an obvious discontinuity or a grounded, uncoated conductive metal surface. An audible signal indicates a coating flaw. Turn the sponge or rod, using the corner only, to zero on a suspected flaw.

When a pinhole is located, the flaw shall be designated by encircling with chalk or a comparable, easily removable marking.

ACCEPTANCE CRITERIA — Any discontinuities shall be referred to Engineering for evaluation and disposition.

*This is a duplicate — Probably because
the entire inspection is 100% OK!
in Bond Ballhit!*

POOR ORIGINAL

Vancomar Conting Inspected

3. 2-RC-P-1C Reactor Coolant Pump Supports - Ref. Dwg. 11448-MH-53C and H

1. Eight (8) Lug ends (Item 1, FH-53C).
2. Eight (8) Clevis ends (Item 2, MH-53C).
3. Eight (8) Pins (Item 3, MH-53C).
4. Two (2) Clevis's (Item 18 and 20, MH-53H).
5. Four (4) Rods (Item 17, FH-53H).

Initials

Date

Comments

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

4. 2-RC-R-2 Pressurizer Support - Ref. Dwg. 11448-MH-53B

1. Four (4) Clevis's (Item 2).
2. Four (4) Pins (Item 3).
3. Eight (8) Guide Brackets (Item 52).
4. Twelve (12) Bracket Pins (Item 53).
5. Eight (8) Trunnion Caps (Item 5).
6. Four (4) Trunnion Mounts (Item 6).
7. Four (4) Insert Plates (Item 7).

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

POOR ORIGINAL

TABLE 3 -- VASTNESS OF THE OCEAN

Vulcanox Coating Improved

Deco

10

2000

RECTOR CONTACT PUGS SUPPOTIS - Ref. Dv8. 11/18-11-53

Elmer (a) Businda (litter 1, PH-53C).

Fish (B) closely con. (Item 2, PL-532).

K142E (8) P140 (1704 3, PM-52C).

(2) Cleveland (Trains 17 and 19, FH-53H).

U.S. DEPT. OF AGRICULTURE

80-11-10 Vector Control Pulp Supports

Reiche (8) Luzardo (Iowa I, PI-53C).

(8) Clevehead (Itca 2, HT-53C).

(8) Pines (1893-3, F-53C).

Q166-14 and 19. HL-5317.

THE

FOR ORIGINAL

Magnetic Particle Inspected

<u>Initials</u>	<u>Date</u>	<u>Comments</u>
-----------------	-------------	-----------------

3. 2-FC-P-1C Reactor Coolant Pump Support - Ref. Dwg. 11468-FH-53A

- | | | | |
|---|-------|-------|-------|
| 1. The four upper legs (Items 1-4, FH-53A) including the welds between the pipe and plug. | _____ | _____ | _____ |
| 2. The four lower legs (Items 5-8, FH-53A) including the welds between the pipe and plug. | _____ | _____ | _____ |
| 3. The four horizontal pipe braces (Item 9, FH-53A) including the weld between the pipe and plug. | _____ | _____ | _____ |
| 4. The four upper support diagonals (Item 10, FH-53A) including the three welds between pipe and plug and two welds between plug and plate. | _____ | _____ | _____ |
| 5. The support beam assemblies (Items 13 and 20, FH-53A):

The 16-inch Sch. 12 pipe, including end pieces, details 2, 3, 7, and 8 - FH-53H and welds between pipe and end pieces. | _____ | _____ | _____ |
| 6. The two lower support diagonals (Item 35, FH-53A) including welds between pipe and end pieces. | _____ | _____ | _____ |
| 7. The Clevis's (Items 26, 34, 36, and 37, FH-53A). | _____ | _____ | _____ |

4. 2-AC-B-2 Pressurizer Support - Ref. Dwg. 11440-FH-52A and B

- | | | | |
|--|-------|-------|-------|
| 1. Entire length of each support rod (FH-52A). | _____ | _____ | _____ |
| 2. All accessible welds (FH-52A). | _____ | _____ | _____ |
| 3. Welds on trunnion mount (Item 6, FH-52B). | _____ | _____ | _____ |

POOR ORIGINAL

Magnetic Particle Inspection

Initials Date Comments

2. 2-RC-P-1B Reactor Coolant Pump Support - Ref. Dwg. 11443-FM-53A

1. The four upper legs (Items 1-4, FM-53A) including the welds between the pipe and plug.

2. The four lower legs (Items 5-8, FM-53A) including the welds between the pipe and plug.

3. The four horizontal pipe braces (Item 9, FM-53A) including the weld between the pipe and plug.

4. The four upper support diagonals (Item 10, FM-53A) including the three welds between pipe and plug and two welds between plug and plate.

5. The support beam assemblies (Items 17 and 19, FM-53A):

The 16 in. Sch. 12 pipe, including end pieces, details 2, 3, 7, and 8 - FM-53H and welds between pipe and end pieces.

6. The two lower support diagonals (Item 35, FM-53A) including welds between pipe and end pieces.

7. The Clevis's (Items 26, 34, 36, and 37, FM-53A).

POOR ORIGINAL

TABLE 2 -- COMPONENTS TO BE MAGNETIC PARTICLE INSPECTED

	<u>Magnetic Particle Inspection</u>		
	<u>Initials</u>	<u>Date</u>	<u>Comments</u>
1. 2-RC-E-1A Reactor Coolant Pump Support - Ref. Des. 11443-FM-53A			
1. The four upper legs (Items 1-4, FM-53A) including the welds between the pipe and plug.	_____	_____	_____
2. The four lower legs (Items 5-8, FM-53A) including the welds between the pipe and plug.	_____	_____	_____
3. The four horizontal pipe braces (Item 9, FM-53A) including the weld between the pipe and plug.	_____	_____	_____
4. The four upper support diagonals (Item 10, FM-53A) including the three welds between pipe and plug and two welds between plug and plate.	_____	_____	_____
5. The support beam assemblies (Items 17 and 19, FM-53A): The 16-inch Sch. 12 pipe, including end pieces, details 2, 3, 7, and 8 - FM-53B and welds between pipe and end pieces.	_____	_____	_____
6. The two lower support diagonals (Item 23, FM-53A) including welds between pipe and end pieces.	_____	_____	_____
7. The Clavies (Items 25, 26, 35, and 37, FM-53A).	_____	_____	_____

POOR ORIGINAL

Visually Inspected

	<u>Initials</u>	<u>Date</u>	<u>Comments</u>
4. 2-RC-E-2 Pressurizer Support - Ref. Dwg. 11448-N1-52B			
1. Clevis (Item 2)	_____	_____	_____
2. Pin (Item 3) Limited Access	_____	_____	_____
3. Stop Plate (Item 4)	_____	_____	_____
4. Trunnion Cap (Item 5)	_____	_____	_____
5. Trunnion Mount (Item 6)	_____	_____	_____
6. Insert Plate (Item 7)	_____	_____	_____
7. Guide Bracket (Item 52)	_____	_____	_____
8. Bracket Pin (Item 53)	_____	_____	_____
9. Support Rods - N1-52A	_____	_____	_____

Visually Inspected

3. 2-BC-P-1C Reactor Coolant Pump Supports - Ref. Eng. 11446-1M-53A

1. Upper Leg (Item 1)

2. Upper Leg (Item 2)

3. Upper Leg (Item 3)

4. Upper Leg (Item 4)

5. Lower Leg (Item 5)

6. Lower Leg (Item 6)

7. Lower Leg (Item 7)

8. Lower Leg (Item 8)

9. Horizontal Pipe Brace (Item 9)

10. Upper Support Diagonal (Item 10)

11. Adjustable Clevis (Item 12)

12. Adjustable Clevis (Item 13)

13. Support Beam Assembly (Item 18)

14. Support Beam Assembly (Item 20)

15. Clevis (Item 25)

16. Clevis (Item 32)

17. Lower Support Diagonal (Item 35)

18. Clevis (Item 36)

19. Adjustable Clevis (Item 37)

InitialsDateComments

POOR ORIGINAL

Visually Inspected

2. 2-RC-P-18 Reactor Coolant Pump Supports - Ref. Des. 11448-RM-53A

	<u>Initials</u>	<u>Date</u>	<u>Comments</u>
1. Upper Leg (Item 1)	_____	_____	_____
2. Upper Leg (Item 2)	_____	_____	_____
3. Upper Leg (Item 3)	_____	_____	_____
4. Upper Leg (Item 4)	_____	_____	_____
5. Lower Leg (Item 5)	_____	_____	_____
6. Lower Leg (Item 6)	_____	_____	_____
7. Lower Leg (Item 7)	_____	_____	_____
8. Lower Leg (Item 8)	_____	_____	_____
9. Horizontal Pipe Brace (Item 9)	_____	_____	_____
10. Upper Support Diagonal (Item 10)	_____	_____	_____
11. Adjustable Clevis (Item 12)	_____	_____	_____
12. Adjustable Clevis (Item 13)	_____	_____	_____
13. Support Beam Assembly (Item 17)	_____	_____	_____
14. Support Beam Assembly (Item 19)	_____	_____	_____
15. Clevis (Item 26)	_____	_____	_____
16. Clevis (Item 34)	_____	_____	_____
17. Lower Support Diagonal (Item 35)	_____	_____	_____
18. Clevis (Item 36)	_____	_____	_____
19. Adjustable Clevis (Item 37)	_____	_____	_____

POOR ORIGINAL

TABLE 1 -- COMPONENTS TO BE VISUALLY INSPECTED

	Visually Inspected		
	Initials	Date	Comments
1. 2-RC-P-1A Reactor Coolant Pump Supports - Ref. DWG. 11440-EM-53A			
1. Upper Leg (Item 1)			
2. Upper Leg (Item 2)			
3. Upper Leg (Item 3)			
4. Upper Leg (Item 4)			
5. Lower Leg (Item 5)			
6. Lower Leg (Item 6)			
7. Lower Leg (Item 7)			
8. Lower Leg (Item 8)			
9. Horizontal Pipe Brackets (Item 9)			
10. Upper Support Diagonal (Item 10)			
11. Adjustable Clevis (Item 12)			
12. Adjustable Clevis (Item 13)			
13. Support Beam Assembly (Item 17)			
14. Support Beam Assembly (Item 19)			
15. Clevis (Item 26)			
16. Clevis (Item 34)			
17. Lower Support Diagonal (Item 35)			
18. Clevis (Item 36)			
19. Adjustable Clevis (Item 37)			

POOR ORIGINAL

To: Don Neighbors (NRC)

Summary of stress for earthquake concurrent with complete failure of reactor coolant pump support.

(Values are given for both old ARS and New ARS being used in Sump pipe stress work)

Line Loop	Original ARS				New ARS			
	OBE	%yp	DBE	%yp	OBE	%yp	DBE	%yp
1 A	17,058	93	16,249	88	15,908	86	15,191	88
B	17,926	97	17,050	92	16,627	90	16,918	92
C	29,893	162	29,335	158	27,788	150	28,122	155
2 A	17,174	93	14,931	81	14,711	80	13,100	17
B	19,002	103	18,012	87	17,321	94	16,419	90
C	27,829	146	27,337	115	23,074	125	19,377	105
3 A	37,227	201	35,697	193	30,462	165	27,281	147
B	35,193	190	33,775	182	28,957	156	26,039	141
C	40,480	219	39,391	213	29,148	158	25,466	136
4 A	19,053	103	22,719	123	18,070	98	18,335	99
B	24,251	131	24,240	131	19,358	105	18,029	97
C	24,597	117	26,162	141	13,158	99	13,371	99
5 A	27,631	149	34,466	186	21,910	118	23,332	129
B	27,362	148	34,156	185	21,517	116	23,554	127
C	28,074	152	34,740	188	21,947	119	23,206	128
6 A	24,657	187	43,262	234	27,092	146	29,574	162
B	46,691	252	46,423	251	35,657	193	31,401	176
C	50,240	272	49,189	266	33,912	210	33,770	182

POOR ORIGINAL

The following is a summary of the stresses for the case of normal operation loads plus the OBE plus the complete failure of ~~the~~ the reactor coolant pump support.

The values listed are the maximum for all three loops.

LocationStress

S.G. Outlet (near nozzle)

37,069 psi

52% ultimate

200% above yield

R.V. Inlet (safe end)

40,911 psi

57% ultimate

221% above yield

The maximum stresses occur at the S.G. Outlet and ~~at~~ near the R.V. Inlet and ~~the~~ decrease in towards the R.C. pump.

Don Neighbors

2 of 2

The following is a load summary
for the same case as on page 1.
The allowables listed are the DBE
allowables

Location

Load

S.G. Outlet (near nozzle)

3.9×10^6 ft-lbs.

allowable

2.1×10^6 ft-lbs.

A.V. Inlet (safe end)

3.6×10^6 ft-lb.

allowable

4.0×10^6 ft-lb.

Stresses and loads from DBE
will be available tomorrow morning