

DISTRIBUTION AFTER ISSUANCE OF OPERATING LICENSE

NRC FORM 195

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NUMBER

50-289

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

FILE NUMBER

TO:

R W Reid

FROM:

Metropolitan Edison Company
Reading, Pa
J G Herbein

DATE OF DOCUMENT

9-8-77

DATE RECEIVED

9-14-77

LETTER

☐ NOTORIZED

PROP

INPUT FORM

NUMBER OF COPIES RECEIVED

☒ ORIGINAL☒ UNCLASSIFIED☐ COPY

1 SIGNED

DESCRIPTION

ENCLOSURE

Advising that they agree to
accomplish following items related
to heat decay pump shafts.....

1 Vibration testing

2 Ultrasonic Inspection

& transmitting the following:

4p

September 3 & 4 Testing results.....

16p

PLANT NAME: Three Mile Island #1

1493 128

9-14-77 ehf

SAFETY

FOR ACTION/INFORMATION

BRANCH CHIEF: (7)

REID

INTERNAL DISTRIBUTION

☒ REG FILE☐ NRC PDR☐ I & E (2)☐ OELD☐ HANAUER☐ CHECK☐ STELLO☐ EISENHUT☐ SHAO☐ BAER☐ BUTLER☐ GRIMES☐ J. COLLINS

EXTERNAL DISTRIBUTION

CONTROL NUMBER

LPDR: HARRISBURG PA.

TIC

NSIC

16 CYS ACRS SENT CATEGORY B

mgs

772570 2075

7910800 691



METROPOLITAN EDISON COMPANY SUBSIDIARY OF GENERAL PUBLIC UTILITIES CORPORATION

POST OFFICE BOX 542 READING, PENNSYLVANIA 19603

TELEPHONE 215 - 929-3601

September 8, 1977
GQL 1234

Director of Nuclear Reactor Regulation
Attn: R. W. Reid, Chief
Operating Reactors Branch No. 4
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Docket No. 50-289
Operating License No. DPR-50
Decay Heat Pump Shafts

As a result of our meeting with you on September 7, 1977, Met-Ed agrees to accomplish the following items which are related to the TMI-1 Decay Heat Pumps.

1. Monthly inspections and tests will be performed on each Decay Heat Pump. These will include both Ultrasonic and Vibration testing. Liquid Penetrant pump shaft inspections will be deferred, but may be conducted in the event the specific acceptance criteria of the UT and/or Vibration tests are not met.

A. Vibration Testing

Vibration testing shall be performed monthly at a flow rate of 600 GPM.

Two sets of vibration data shall be taken for each monthly test. The first set of data shall be taken prior to de-coupling the shaft, and the second set of data shall be taken after the shaft has been re-coupled.

The second set of data shall be the baseline data for the next monthly test. If the vibration level at any of the normally measured frequencies (900, 1800, 3600, and 18,000 RPM) increases by more than

1493 129

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50% above that month's baseline, or if any new frequency peaks are detected, such changes shall be evaluated. This evaluation will be based on the following criteria:

- (1) If vibration peaks exceed Hydraulic Institute limits for 1800 RPM (3.5 mils peak to peak) or the corresponding IRD Chart limits for other frequencies then pump coupling realignment, adjustment of operating conditions, and any other possible contributing factors will be investigated and evaluated with appropriate corrective actions taken. If these corrective actions do not reduce the vibration below the specified limits within 24 hours, then the pump will be disassembled and the pump shaft shall be removed for liquid penetrant and radial ultrasonic inspection.
- (2) If vibration levels increase by 50%, but are still less than the specified Hydraulic Institute limits, then the vibration levels will be analyzed to determine if they indicate an existing problem. This analysis will consider amplitude changes at all other frequencies, and whether re-coupling of the shaft or changes of system conditions caused the vibration changes. If this analysis results in a determination that a problem exists, then the pump will be disassembled and the pump shaft shall be removed for liquid penetrant and radial ultrasonic inspection.

The analysis of the 50% increase data shall be provided to the NRC together with the detailed test data.

- (3) If one pump shaft is inspected as a result of vibration tests, and it is confirmed to be defective, then the shaft shall be replaced with a new shaft, and the second pump shall be disassembled and inspected as soon as the first pump is returned to service.
- (4) Technical Specification limits on pump operability shall be observed.

The NRC shall immediately be notified if any vibration testing condition requiring the above evaluations is observed. The results of these evaluations and the detailed test data shall be forwarded to the NRC as part of a complete report.

B. Ultrasonic Inspection

Ultrasonic Inspections shall be performed monthly. If the presence of any new ultrasonic reflector is detected in one of the pump shafts, the following actions shall be taken:

- (1) The pump shall be disassembled within 24 hours, and the pump shaft removed for further inspections to determine the cause of the reflector. These inspections shall include liquid penetrant and radial ultrasonic inspections.

- (2) If a defect condition is determined to be present, the shaft shall be replaced with a new shaft, and the second pump will be disassembled and inspected as soon as the first pump is returned to service.
- (3) Technical Specification limits on pump operability shall be observed.

The NRC shall immediately be notified if any ultrasonic inspection condition requiring the above actions, is observed. The inspection data and test results shall be forwarded to the NRC with a detailed report.

C. September 3 & 4 Test Results

Attached hereto are the results of the vibrational testing and UT inspections performed on the shafts of decay heat pump 1A and 1B on September 3 and 4, respectively. The second set of vibration data establishes the baseline for the next monthly test, and the UT inspection data establishes the baseline for all subsequent UT inspections.

Monthly inspections shall follow the September 3 and 4 inspection dates \pm 25% of the inspection interval per TMI-1 Technical Specification Section 4.

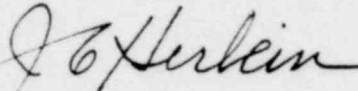
2. A metallurgical and Fracture analysis of the Crystal River Unit #3 failed shaft is being performed by Babcock and Wilcox. The preliminary report shall be submitted to the NRC by September 14, and the final report by September 28, 1977.
3. Met-Ed and B & W are investigating and reviewing the metallurgical the 1A and 1B decay heat pump shafts based on the QC records and material certifications. A preliminary report shall be submitted to the NRC by September 21, and the final report by October 5, 1977.
4. A review of the decay heat pump design and its operation in the 80 GPM recirculation mode is being performed by Met-Ed and B & W. The results of this review shall be submitted to the NRC by October 5, 1977.
5. The pump manufacturer has established that the decay heat pumps will provide continuous operation in the 80 gpm recirculation mode for two (2) hours while maintaining their capability to respond to full flow demand. Our NSSS vendor has reviewed this capability and compared it to his analysis of the capability required to respond to the loss of coolant accidents as analyzed in the TMI Unit I FSAR and has concluded that the decay heat pumps are adequate for this application. In addition, our

1493 131

September 8, 1977
GQL 1234

Met-Ed Generation Engineering Department has reviewed the results of both of these foregoing reviews and has concluded that the decay heat pumps do indeed provide assurance that TMI Unit 1 meets the requirements of the Final Safety Analysis Report, thus assuring the health and safety of the public.

Sincerely,



J. G. Herbein
Vice President

JGH:WEP:iem

Attachments 3

1493 132

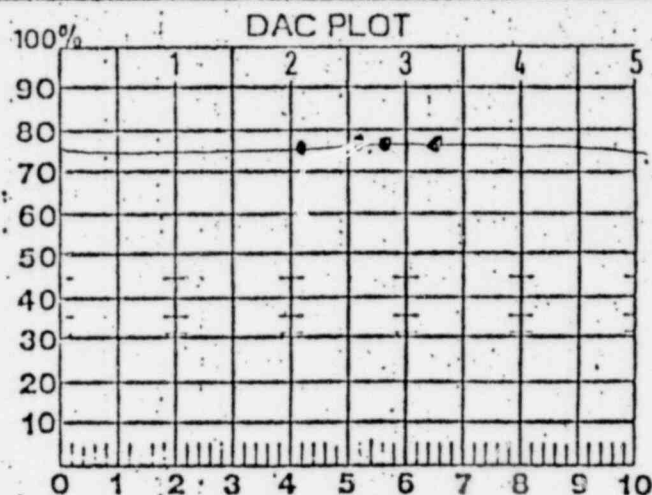


NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOONE ST.
RAHWAY N.J.

CALIBRATION DATA SHEET

Plant & Unit No. <u>TM1 UNIT #1 WHSH</u>		Data Sheet No.: <u>1</u>	
Component or System <u>SHAFT</u> <u>shaft # 738-485-300-1</u>		Size <u>2 1/8 - 3 1/4</u>	Sketch/ISO No.:
Procedure No. <u>UT-1-NP</u>		Rev./Change No. <u>1</u>	Date: <u>31 AUG 1977</u> <u>10# 32408</u>
Page <u>1</u> of <u>1</u>		Calibration Block Ident: <u>SHAFT ITEM 5</u>	

SEARCH UNIT	Scan Angle <u>0°</u> Mode <u>LONG</u>
Texturing (if any)	<u>None</u>
Style or Type No.	<u>57A2214</u>
Size & Shape	<u>.25" DIA.</u>
Frequency	<u>5 MHz</u>
Serial No./Brand	<u>26496 A II</u>
Measured Angle	<u>0</u>
Cable Type & Length	<u>6' MICRO DOT</u>
Couplant Used	<u>ULTRAGEL II MAT # 8276</u>



Instrument Linearity Calibration			
Amplitude			
high	low	high	low
1 80	40	5.30	15
2.60	30	6.20	10
3.50	25	7.15	8
4.40	20	8.10	~

Amplitude Control Linearity

Initial	dB Δ	Result
80	-6	40
80	-12	19
40	+6	89
20	+12	80

Calibration Checks

Scan Area	Initial Cal.	Time
0° Whaz <input checked="" type="checkbox"/>	Intermediate	1:20
0° Mat'l <input checked="" type="checkbox"/>	Intermediate	
Axial <input checked="" type="checkbox"/>	Intermediate	
Girth <input checked="" type="checkbox"/>	Final Cal.	14:25

INSTRUMENT SETTINGS			
Mfg./Model No.: <u>U. J. AUTOMATION</u>			
Serial No.: <u>89559-5</u>			
Sweep Length: <u>.5-5</u>			
Sweep Delay: <u>0.5</u>			
Pulse Length or Damping: <u>OFF</u>			
Frequency: <u>2.25</u> Filter: <u>3</u>			
Db Gain (fine): <u>10</u>			
Gain (coarse): <u>40</u>			

Depth	Amp	Atten.
In.	%	dB
1 2 1/8	75	50
2 2 1/2	75	50
3 2 3/4	75	50
4 3 1/8	75	50

1493 133

Examination Item/Weld	Recordable Indication		Comments or Reason For Incompleted Scan(s)
	Yes	No	
SHAFT		<input checked="" type="checkbox"/>	NO DISCONTINUITIES DETECTED
P.O.# 32408			
ITEM #5			
POOR ORIENTATION			

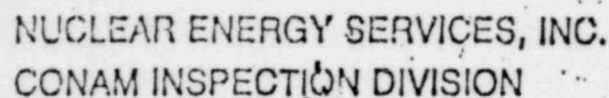
Additional Sheet Attached (check box)

Continuation ☒ Beam Plot ☒

Examiner(s)
1. Bill Thompson TC-1A Level II
2. _____ TC-1A Level _____

Date: 31 Aug 1977

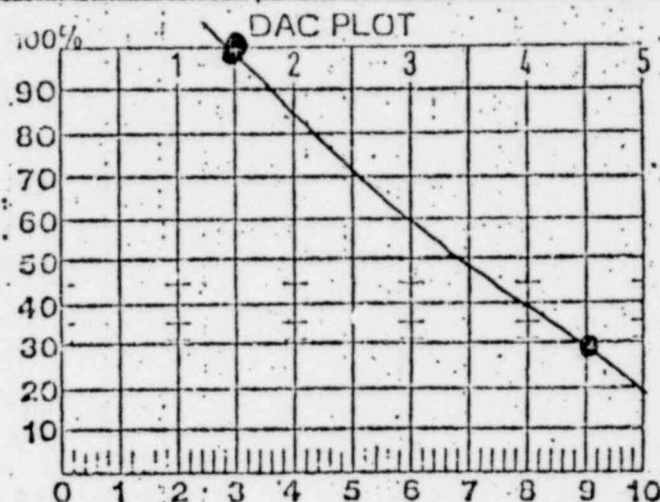
Reviewed: _____



CALIBRATION DATA SHEET

Plant & Unit No. <u>TMI UNIT 1</u>		Data Sheet No.:	
Component or System <u>DHP1B SHAFT</u>		Size <u>35" LONG</u>	Sketch/ISO No.:
Procedure No. <u>UT-1-NP</u>	Rev./Change No. <u>1</u>	Date: <u>12 JAN 1969</u>	
Page <u>1</u> of <u>1</u>	Calibration Block Ident: <u>1/8" FBH 12" x 35" DEEP</u>		

SEARCH UNIT	Scan Angle <u>0°</u> Mode <u>Long</u>
Texturing (if any) :	<u>NONE</u>
Style or Type No. :	<u>SFE 57K0219</u>
Size & Shape :	<u>1/2" DIA.</u>
Frequency :	<u>2.25 MHz</u>
Serial No./Brand :	<u>Automation S/N 46111</u>
Measured Angle :	<u>0°</u>
Cable Type & Length:	<u>6' MICRODOT</u>
Couplant Used :	<u>ULTRAGEL</u>



Instrument Linearity Calibration			
Amplitude			
high	low	high	low
1.	N	5.	
2.		6.	
3.		7.	
4.		8.	

Amplitude Control Linearity

Initial	dB Δ	Final
80	-5	40
80	-12	19
40	-5	80
20	-12	80

Calibration Checks | 11

Scan Area	Initial Cal.	1425
0° Whaz	Intermediate	
0° Mat'l	Intermediate	
0° Axial	Intermediate	
Circ.	Final Cal.	1600

Examiner(s)	
1. <u>[Signature]</u>	TC-1A Level
2. _____	TC-1A Level

Date: 3 SEPT 1977

Reviewed:

INSTRUMENT SETTINGS

Mfg./Model No.: *W. J. Reflectoxide*

Serial No. : *89559-5*

Sweep Length : *5-50*

Sweep Delay : *5-50*

Pulse Length or Damping: *mu N*

Frequency: *2.25* Filter: *3*

Db Gain (fine): *2*

Gain (coarse) *40*

1/8" Int.	Depth In.	Amp %	Atten. dB
12 ^s	12"	SAT	42
35 ^v	35"	30	42

1493 134

[illegible]

Additional Sheet Attached (check box)

Continuation	NO	Beam Plot	NO
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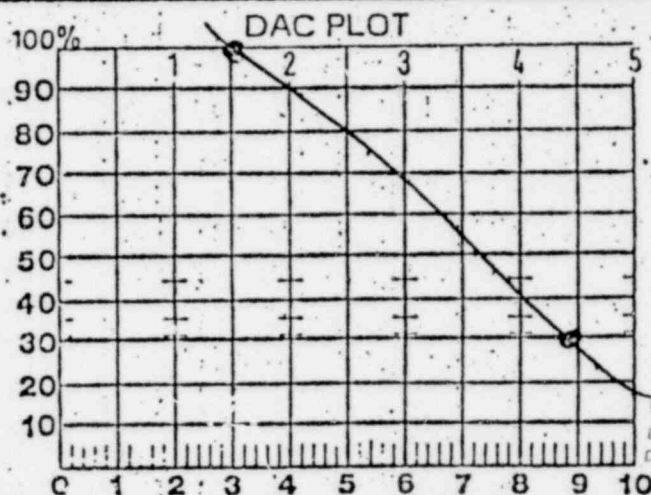


NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

CALIBRATION DATA SHEET

Plant & Unit No. <u>TM1 UNIT 1</u>		Data Sheet No.:	
Component or System <u>DHP1A SHAFT</u>		Size <u>35" DIA</u>	Sketch/ISO No.:
Procedure No. <u>UT-1-NP</u>	Rev./Change No. <u>1</u>	Date: <u>12 JUN 1969</u>	
Page <u>1</u> of <u>1</u>	Calibration Block Ident: <u>1/8" FBH 12" & 35" DEEP</u>		

SEARCH UNIT	Scan Angle <u>0°</u> Mode <u>LONG</u>
Texturing (if any)	<u>NONE</u>
Style or Type No.	<u>SFZ 57K0219</u>
Size & Shape	<u>1/2" DIA.</u>
Frequency	<u>2.25 MHz</u>
Serial No./Brand	<u>AUTOMATIC S/N 46111</u>
Measured Angle	<u>0°</u>
Cable Type & Length	<u>6' MICRODOT</u>
Couplant Used	<u>ULTRAGEL</u>



Instrument Linearity Calibration			
Amplitude		Amplitude	
high	low	high	low
1		5.	
2.		6.	
3.		7.	
4.		8.	

Amplitude Control Linearity

Initial	dB Δ	Result
80	-6	40
80	-12	19
40	+6	80
20	+12	80

Calibration Checks

Scan Area	Initial Cal.	Time
0° Whaz	Intermediate	
0° Mat'l	Intermediate	
Axial	Intermediate	
Circ.	Final Cal.	1130

INSTRUMENT SETTINGS			
Mfg./Model No.:	<u>U.T. REFLECTOR</u>		
Serial No.:	<u>89559-5</u>		
Sweep Length	<u>5-50</u>		
Sweep Delay	<u>5-50</u>		
Pulse Length or Damping	<u>MIN</u>		
Frequency	<u>2.25</u>	Filter:	<u>MIN</u>
Db Gain (fine):	<u>1</u>		
Gain (coarse)	<u>40</u>		

Depth	Amp	Atten.
In.	%	dB
1/8" FBH 12"	30	41
1/8" FBH 35"	30	41

1493 135

Examination Item/Weld	Recordable Indication		Comments or Reason For Incompleted Scan(s)
	Yes	No	
SHAFT		<input checked="" type="checkbox"/>	NO DISCONTINUITIES DETECTED
PUMP		<input checked="" type="checkbox"/>	
DHP1A		<input checked="" type="checkbox"/>	

Additional Sheet Attached (check box)

Continuation	<u>NO</u>	Beam Plot	<u>NO</u>
Supplements	<u>NO</u>	No attachments	<u>NO</u>

Examiner(s)	
1. <u>W. J. Thompson</u>	TC-1A Level III
2. <u></u>	TC-1A Level
Date: <u>4 SEPT 1977</u>	
Reviewed: <u></u>	

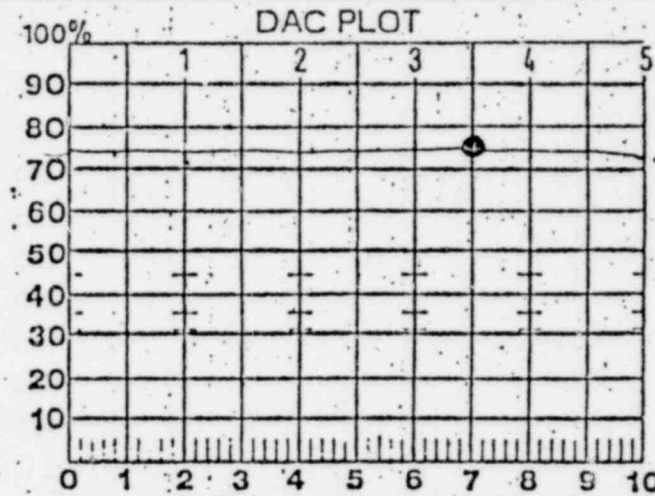


NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

CALIBRATION DATA SHEET

Plant & Unit No. <u>TM1 UNIT 1</u>		Data Sheet No.:	
Component or System <u>DHP SHAFT</u>		Size <u>48"</u>	Sketch/ISO No.:
Procedure No. <u>U.T-1-NP</u>		Rev./Change No. <u>1</u>	Date: <u>12 JUN 1969</u>
Page <u>1</u> of <u>1</u>	Calibration Block Ident: <u>BACK Reflection</u> ^{Pot# Item} <u>31352 1</u>		

SEARCH UNIT	Scan Angle <u>0°</u> Mode <u>LONG</u>
Fixturing (if any)	<u>NONE</u>
Style or Type No.	<u>SFZ 57K0219</u>
Size & Shape	<u>1/2" DIA</u>
Frequency	<u>2.25 MHz</u>
Serial No./Brand	<u>Automation S/N 46111</u>
Measured Angle	<u>0°</u>
Cable Type & Length	<u>6' MICRODOT</u>
Couplant Used	<u>ULTRAGEL</u>



Instrument Linearity Calibration			
Amplitude			
high	low	high	low
1		5.	
2.		6.	
3.		7.	
4.		8.	

Amplitude Control Linearity		
Initial	dB Δ	Result
80	-6	40
80	-12	19
40	+6	80
20	+12	80

INSTRUMENT SETTINGS			
Mfg./Model No.: <u>U.S. Reflectance</u>			
Serial No.: <u>89559-5</u>			
Sweep Length: <u>.5-5</u>			
Sweep Delay: <u>.5-5</u>			
Pulse Length or Damping: <u>MIN</u>			
Frequency: <u>2.25</u> Filter: <u>3</u>			
Db Gain (fine): <u>24</u>			
Gain (coarse): <u>20</u>			

lent.	Depth In.	Amp %	Atten. dB
<u>T</u>	<u>3 1/2"</u>	<u>75</u>	<u>44</u>

Examination Item/Weld	Recordable Indication		Comments or Reason For Incompleted Scan(s)
	Yes	No	
<u>3 1/2" DIA</u>		<input checked="" type="checkbox"/>	<u>NO DISCONTINUITIES DETECTED,</u> <u>NO LOSS OF BACK REFLECTION DETECTED</u>
<u>BAR 48" LONG</u>			
<u>POT# 31352</u>			
<u>ITEM# 1</u>			

POOR ORIGINAL

Scan Area	Initial Cal.	Time
0° Whaz	Intermediate	
0° Mat'l	Intermediate	
Axial	Intermediate	
Circ.	Final Cal.	<u>1215</u>

Examiner(s)	
1. <u>[Signature]</u>	TC-1A Level
2. <u>[Signature]</u>	TC-1A Level
Date: <u>4 SEPT 1977</u>	
Reviewed: _____	

Additional Sheet Attached (check box)	
Continuation <input checked="" type="checkbox"/>	Beam Plot <input checked="" type="checkbox"/>

Name THOMPSON, CLYDE W LIAM

Birth Date 10-13-42

(Jaeger Type J-1 Lenses)

Distant Vision

Near Vision

Colorvision Optometrist

Date	Uncorrect		Correct		Uncorrect		Correct			
	LE	RE	LE	RE	LE	RE	LE	RE		
5-31-72	20/40		20/10		5/1	5/1			Normal	Lydia M. Munk
Oct-8-76	20/20	20/20			5/1	5/1			Normal	Paul M. Munk
4/11/77	20/40	20/20			5/1	5/1			Normal	J. Munk

Education, Name of School

Length, Date's

Attended

Subj's. Studied

Grammar School	Worthington, Ohio	3 yrs.	6-56	General
High School	Hilliard, Ohio	4 yrs.	6-60	Industrial Arts
College				
Tech. School	Chanute AFB	13 months	7-70	NDT
Correspondence	Air University Extension Course	5 months	7-71	NDT

N.D.T. School and Courses

Date's

Subject

Chanute AFB	3 months	7-70	NDT
Air University Extension Course	5 months	7-71	NDT

Experience, Training, Type

Date's Level

N.D. Inspection U.S.A.R.	1967 to 19 Oct-71	Inspector (Staff Sgt.)
Isotope Radiographic Cert.	8-5-72	Ind. 192, Co 60
Conam Inspection, Cols. OH	4-5-72 to 2-20-73	II RT; MT; PT; UT
Conam Inspection, Rahway NJ	2-73 to 6-74	II RT; MT; PT; UT
Aerospace Materials, Cols. OH	6-74 to 8-75	III (QC Mgr. also)
Conam Inspection, Cols. OH	10-7-76 to present	II RT; MT; PT; UT

Certified To SNT-TC-1A, Type

Date's Level

Conam Inspection, Inc. PT, MT,	5-11-72	II
Conam Inspection, Inc. UT, RT,	5-4-72	II
Conam Inspection Rahway NJ Div. RT; MT; PT; UT	2-73	II
Aerospace Materials, Cols. OH. MT; PT; UT	6-74	III
Conam Inspection Cols. OH RT; MT; PT; UT	10-7-76	II
Conam Inspection Cols. OH RT; MT; PT; UT	2-77	II 99-CNTP-001

POOR ORIGINAL

Signed by Dale T. Fister Level III ASNT-TC-1A

Dale T. Fister

Page 14 of 12

1493-137

PERSONNEL CERTIFICATION

NAME Clyde Wm. Thompson

ALL HISTORICAL INFORMATION SUPPLIED BY ME TO COMPILE THIS CERTIFICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. SIGNED Clayton H. McCreary DATE 2-77

Revision:

Issued: 5-3-76

Issued:

[illegible][illegible]



NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

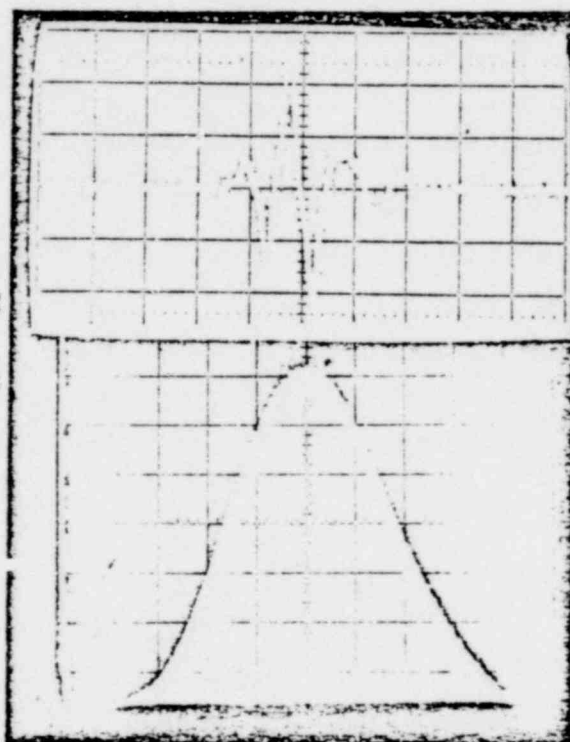
1385 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 26496

MARKED FREQUENCY: 5.0 MHz SIZE: .25"

DATA SUPPLIED BY: Panametrics



POOR ORIGINAL

RESULTS

Central Scale Frequency 5.0 MHz (1.0 MHz/Division)

Transducer Central Frequency 5.0 MHz

1493 139

☒ Acceptable

☐ Unacceptable

Interpretation By

F.T. Carr

F.T. CARR 8/1/75

BRANCH OFFICE
WENCOTE P. O. BOX 13
207 GLENSIDE AVENUE
WENCOTE, PENNA. 19095

(215) 634-5495

International Testing Laboratories Inc.

Materials Testing and Consulting Engineers

Weighers, Samplers and Assayers

578-1 MARKET STREET

NEWARK, N. J., 07105

PHONE (201) 589-4772-3-4

TELEX 139187

BRANCH OFFICE
333 N. MICHIGAN AVE.
CHICAGO, ILLINOIS 60601

(312) 427-7000

REPORT OF ASSAY

No. 416945

DATE August 12, 1976

Our assay of the sample of Ultragel II Ultrasonic Couplant

From Echo Laboratories

Marked: Batch #8276
Spec. ASTM-D-129 and D-808
Purchase Order No. 1452

and submitted to us, show

Halogens-----7.5 ppm

Sulphur-----4.1 ppm

To Echo Laboratories
Titusville, Penna.

INTERNATIONAL TESTING LABORATORIES, INC.

The liability of the International Testing Laboratories, Inc. with respect to the services charged for herein, shall in no event exceed the amount of the invoice. Our reports pertain to the sample tested only. Information contained herein is not to be reproduced, except with our permission.

David H. Hoffman

ITL 112B REV. 20M 6-75

POOR ORIGINAL

1493 140

NUCLEAR ENERGY SVCS

CONAM INSPECTION INC.

U.J. REFLECTOSCOPE:

1385 WITHERSPONE ST
RAHWAY NEW JERSEY

S/N 89559-5

① INSTRUMENT CALIBRATION DATE 20 APR 1977

② INSTRUMENT LINEARITY VERIFICATION

DATE 1 AUGUST 1977

DATE NEXT DUE NOVEMBER 1, 1977

31 AUGUST 1977

Bill Thompson

CONAM INSPECTION

1493 141

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

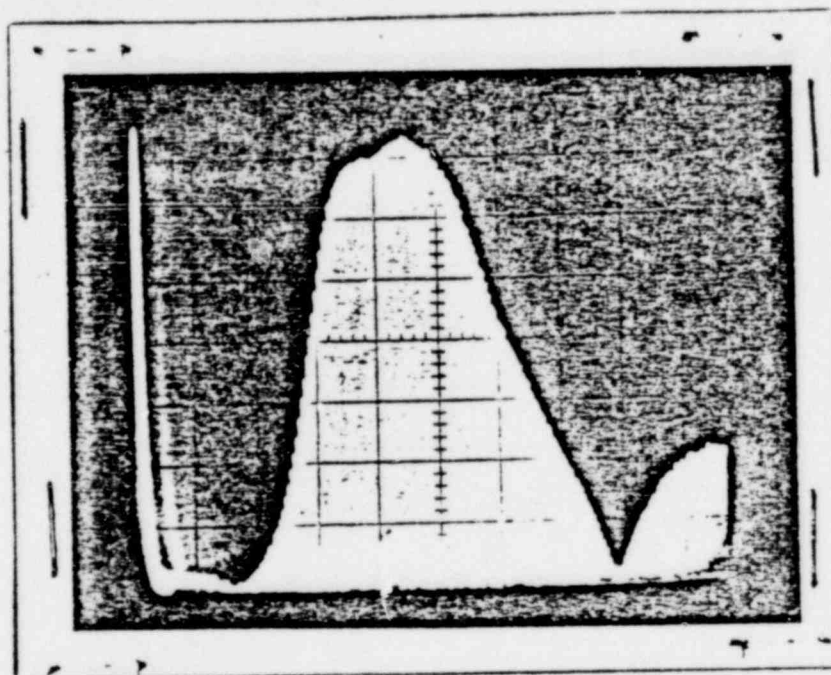
1365 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 46111

MARKED FREQUENCY: 2.25 MHz SIZE: .5" diameter

DATA SUPPLIED BY: Automation Industries



POOR ORIGINAL

RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.25 MHz

☒ Acceptable

☐ Unacceptable

1493 142

Interpretation By

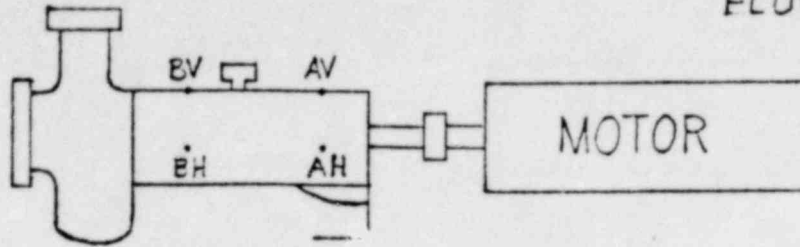
F. T. Carr

8/26/77

AN AUTOMATION INDUSTRIES PRODUCT

F. T. Carr

DATA TAKEN: 9/5/77
 TAKEN BY: G. M. STAUBT
 INST. MODEL: 330
 CAL. DUE DATE: 3-14-78
 FLOW: 675 GPM



DHP-1A

CPM		900	1800	3600	18,000
AV	DISPLACEMENT - MILS	.08	.04	.06	.02
BV		.04	.05	.05	.01
AH		.05	.05	.12	.018
BH		.08	.09	.1	.02

DHP-1B

CPM		900	1800	3600	18,000
AV	DISPLACEMENT - MILS	.15	.18	.06	.03
BV		.08	.17	.07	.03
AH		.15	.52	.09	.06
BH		.1	.9	.08	.01

Babcock & Wilcox

Power Generation Group

P.O. Box 1260, Lynchburg, Va. 24505

Telephone: (804) 384-5111

September 8, 1977 i

Mr. R. M. Klingaman
Manager, Generation Engineering
Metropolitan Edison Company
P.O. Box 542
Reading, Pennsylvania 19603

POOR ORIGINAL

Dear Mr. Klingaman:

Per Met Ed request, we are responding to the NRC question raised yesterday, September 7, 1977, in an NRC/Met Ed meeting in which B&W participated. This question concerned limits on extended operation of the Met Ed, TMI-1 Decay Heat pumps in the 80 gpm recirculation mode and the impact of those limits on requirements of the TMI-1 ECCS analysis.

B&W requested that Worthington, the Decay Heat pump vendor, state in writing the limits that apply to these pumps during the 80 gpm recirculation mode which would avoid pump degradation. B&W has received a Worthington TWX on September 8, 1977, copy attached, that supports 30 minute runs, four times per year or a two-hour run at one time. The upper limit in this mode is a total of 80 hours for the life of the pump. Worthington has verbally stated that, with further investigation, these limits may be further relaxed without pump degradation.

B&W has investigated this situation relative to the two-hour Decay Heat pump limit and the TMI-1 ECCS analysis and recommend a procedure change to align the ECCS systems for piggyback operation (DH pump discharge align to MU pump suction) at one hour following the small LOCA if the Decay Heat pump flow rate is less than 550 gpm (including 80 gpm recirculation flow rate). If only one makeup pump is operating, the decay heat pump associated with the makeup pump which is not operating should be shut down. This recommendation is based upon the following:

During a small break LOCA two depressurization phenomena occur independent of break size or orientation. The system immediately depressurizes (several seconds) to saturated pressure corresponding to the initial hot leg enthalpy. This initiates a reactor trip shutting down the core fission reaction. Depressurization continues via heat transfer through the steam generators until such time as the primary system is in approximate equilibrium. The process takes only a few minutes and the resulting pressure corresponds to the setpoint for the secondary system safety valves (1050 psig). Further depressurization will continue at a rate depending on break size. In the piggyback ECCS lineup, each high pressure pump will flow 475 gpm against a back pressure of 1050 psig.

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This flow, plus the 80 gpm decay heat pump recirculation flow, will assure adequate flow through the decay pumps well before the time limit specified by Worthington.

In addition, we believe that the one hour time limit is conservative with respect to the NRC allowance of a half an hour for operator action. Also, placing the plant in the piggyback mode is consistent with operating the plant in a "normal" mode of operation for a small LOCA.

The modified procedure for implementing piggyback operation prescribed above assures the mitigation of all postulated small break LOCA's within the constraints specified for operation of the DH pumps in the recirculation mode and within the NRC criteria for ECCS performance analysis. The ECCS analyses supporting the operating license award for Three Mile Island Nuclear Station Unit 1 will be unaffected by the recommended procedure change.

Very truly yours,

J. D. Phinney
J. D. Phinney, Manager
Operating Plant Services

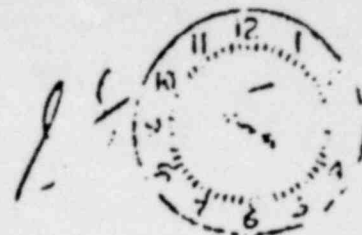
JDP/hh
Attachment

cc: (w/attachment)

GP Miller
JP O'Hanlon
JG Herbein
LC Rogers
JT Janis
EL Logan
LL Lawyer

POOR ORIGINAL

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BABWILCOX LURG

WORTHGTON HSON

U R G E N T

SEPT 8 HARRISON NJ 032 1080
ATTN DON WOOD / STAN FUNKHAUSER
RE CONVERSATIONS MET ED IMI WE FEEL THAT 8 MN-194 OPERATION
AT 30 MINUTE INTERVALS 4 TIMES PER YEAR OR 2 HOURS AT ONE TIME
IS SATISFACTORY. YOU CAN OPERATE IN THIS SITUATION UP TO 60
HOURS WHICH IS EQUIVALENT TO 40 YEAR LIFE. WE HAVE HAD EXCELLENT
OPERATION WITH THIS PRODUCT LINE AND THIS INFLUENCES THIS
DECISION

JOHN H BROCE
WORTHINGTON PUMP CORP
HARRISON NJ
TLX 138972
CC: J ANDERSON
E O MORRISON

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