DISTRIBUTION AFTER ISSUANCE OF OPERATING LICENSE

NRC FORM 195
(2-76)

U.S. NUCLEAR REGULATORY COMMISSION

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

TO: R W Reid	FROM: Metropolitan Edison Company, Reading, Pa, J G Herbein	DOCKET NUMBER: 50-289
		FILE NUMBER:
		DATE OF DOCUMENT: 9-8-77
		DATE RECEIVED: 9-14-77
☒ LETTER ☐ NOTORIZED ☒ ORIGINAL ☒ UNCLASSIFIED ☐ COPY	PROP / INPUT FORM	NUMBER OF COPIES RECEIVED: 1 SIGNED

DESCRIPTION

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

1 Vibration testing

2 Ultrasonic Inspection

& transmitting the following:

4p

ENCLOSURE

September 3 & 4 Testing results....... .....

16p

1493 128

PLANT NAME: Three Mile Island #1

9-14-77 ehf

FOR ACTION/INFORMATION

SAFETY			
BRANCH CHIEF: (7)	REID		

INTERNAL DISTRIBUTION

REG FILE
NRC PDR
I & E (2)
OELD
HANAUER
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STELLO
EISENHUT
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BAER
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7910300691

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

7709270207

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 vibrati 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 ± 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

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

Attachment #1
Met-Ed GQL 1234
9/8/77

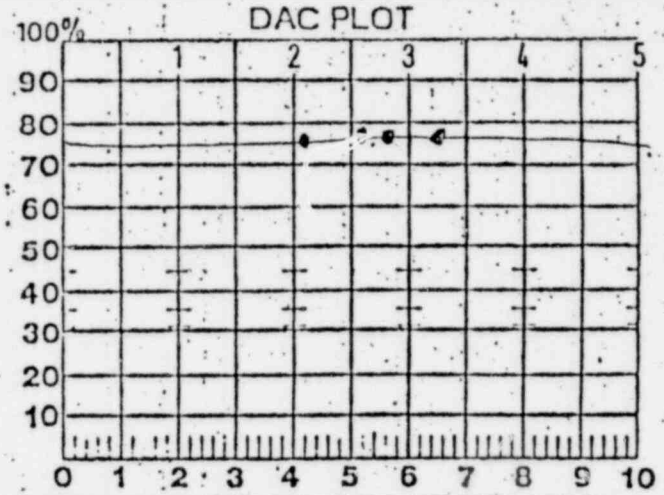
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOONE ST.
RAHWAY N.J.

CALIBRATION DATA SHEET

Plant & Unit No. TMI UNIT #1 WHSH		Data Sheet No.: 1
Component or System SHAFT STUD # 738-485-3000-1	Size 2⅞-3¼	Sketch/ISO No.:
Procedure No. UT-1-NP	Rev./Change No. 1	Date: 31 AUG 1977 (13 JUN 1969)
Page 1 of 1		Calibration Block Ident: SHAFT P.O.# 32405 ITEM 5

SEARCH UNIT	Scan Angle 0° Mode LONG
Fixturing (if any) :	NONE
Style or Type No. :	57A2214
Size & Shape :	.25" DIA.
Frequency :	5 MHZ
Serial No./Brand :	26496 A II
Measured Angle :	0
Cable Type & Length:	6' MICRO DOT
Couplant Used :	ULTRAGEL II LOT # 8276

DAC PLOT



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	80
20	+12	80

INSTRUMENT SETTINGS

Mfg./Model No.:	U.T. AUTOMATION
Serial No. :	89559-5
Sweep Length :	.5-5
Sweep Delay :	0.5
Pulse Length or Damping:	off
Frequency: 2.25	Filter: 3
Db Gain (fine):	10
Gain (coarse)	40

Ident.	Depth In.	Amp %	Atten. dB
1	2⅛	75	50
2	2½	75	50
3	2⅞	75	50
4	3⅛	75	50

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Examination Item/Weld	Recordable Indication Yes	No	Comments or Reason For Incompleted Scan(s)
SHAFT		X	NO DISCONTINUITIES
P.O.# 32408			DETECTED
ITEM #5			

POOR ORIGINAL

Scan Area	Calibration Checks	Time
0° Whaz X	Initial Cal.	1:20
0° Mat'l	Intermediate	
~~Axial~~	Intermediate	
~~Circ.~~	Final Cal.	14:25

Additional Sheet Attached (check box)

Continuation		Beam Plot	
Supplement		No attachments	

Examiner(s)
1. Bill Thompson TC-1A Level III
2. _____ TC-1A Level _____
Date: 31 Aug 1977
Reviewed: _____

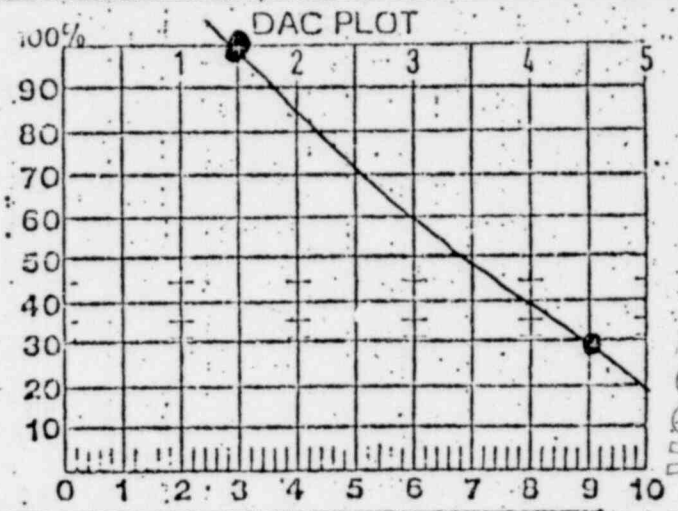
CALIBRATION DATA SHEET

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

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

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

DAC PLOT



Instrument Linearity Calibration Amplitude

high	low	high	low
1		5.	
2.		6.	
3.		7.	
4.		8.	

POOR ORIGINAL

Amplitude Control Linearity

Initial	dB A	
80	-6	40
80	-12	19
40	-6	80
20	-12	80

Calibration Checks

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

INSTRUMENT SETTINGS

Mfg./Model No.:	U.T. Reflectoscope
Serial No. :	89559-5
Sweep Length :	5-50
Sweep Delay :	5-50
Pulse Length or Damping:	MUN
Frequency : 2.25 Filter:	3
Db Gain (fine):	2
Gain (coarse)	40

Examination Item/Weld	Recordable Indication Yes	No	Comments or Reason For Incompleted Scan(s)
SHAFT		X	NO DISCONTINUITIES
Pump			DETECTED
DHPIB			

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

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Additional Sheet Attached (check box)

Continuation	NO	Beam Plot	NO

Examiner(s)

1. [signature] TC-1A Level
2. _____ TC-1A Level

Date: 3 SEPT 1977

Reviewed: _____

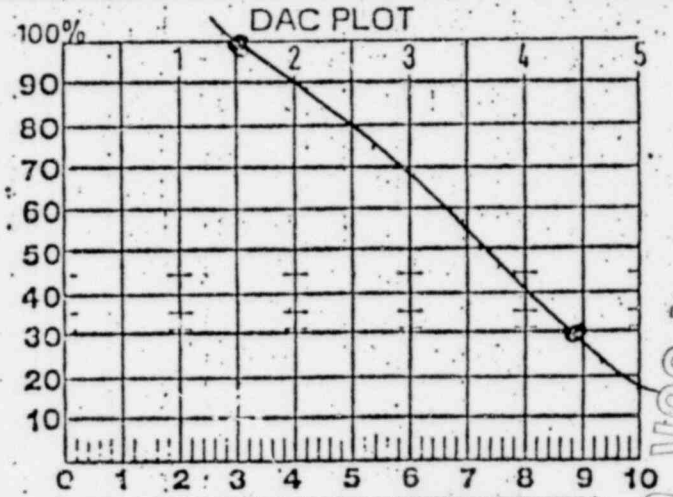
CALIBRATION DATA SHEET

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

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

SEARCH UNIT	Scan Angle 0° Mode LONG
Fixturing (if any) :	NONE
Style or Type No. :	SFE57K0219
Size & Shape :	1/2" DIA.
Frequency :	2.25 MHZ
Serial No./Brand :	AUTOMATION S/N 46111
Measured Angle :	0°
Cable Type & Length:	6' MICRODOT
Couplant Used :	ULTRAGEL

DAC PLOT



Instrument Linearity Calibration

Amplitude

high	low	high	low
1		5.	
2.		6.	
3.		7.	
4.		8.	

POOR ORIGINAL

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

Examination Item/Weld	Recordable Indication Yes	No	Comments or Reason For Incompleted Scan(s)
SHAFT		X	NO DISCONTINUITIES
PUMP			DETECTED
DHPIA			

Amplitude Control Linearity

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

Scan Area	
0° Whaz	
0° Mat'l	X
Axial	X
Circ.	

Calibration Checks	Time
Initial Cal.	00
Intermediate	
Intermediate	
Intermediate	
Final Cal.	1130

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

1493 135

Examiner(s)

1. Russell Thompson TC-1A Level III
2. _____ TC-1A Level _____

Date: 4 SEPT 1977

Reviewed: _____

Additional Sheet Attached (check box)

Continuation	NO	Beam Plot	NO
Supplements	NO	No attachments	NO

Block Temp. 68 °F Component Temp. 72 °F

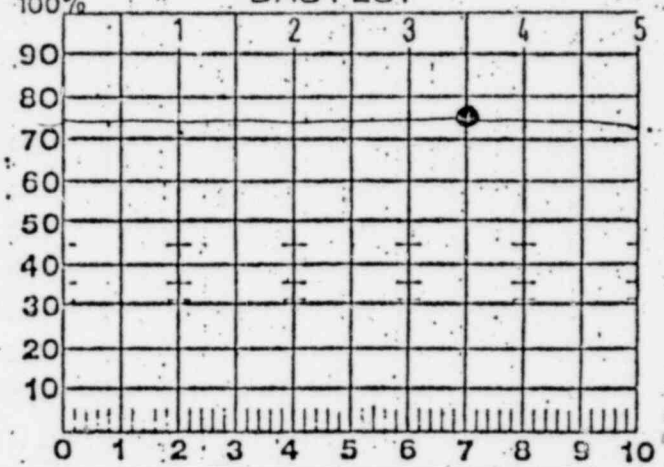
CALIBRATION DATA SHEET

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

Plant & Unit No. TMI UNIT 1		Data Sheet No.:	
Component or System DHP SHAFT	Size 48"	Sketch/ISO No.:	
Procedure No. U.T-1-NP	Rev./Change No. 1	Date: 12 JAN 1969	
Page 1 of 1	Calibration Block Ident: BACK REFLECTION	PO# 39352	ITEM 1

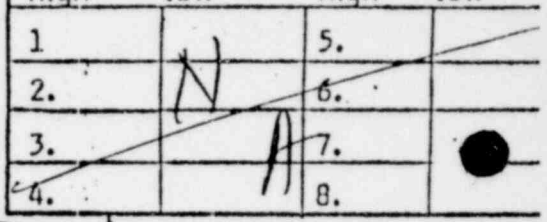
SEARCH UNIT	Scan Angle 0° Mode LONG
Fixturing (if any) :	NONE
Style or Type No. :	SFZ 5.7K0219
Size & Shape :	½" DIA
Frequency :	2.25 MHZ
Serial No./Brand :	AUTOMATION S/N 46111
Measured Angle :	0°
Cable Type & Length:	6' MICRODOT
Couplant Used :	ULTRAGEL

DAC PLOT



Instrument Linearity Calibration

Amplitude



POOR ORIGINAL

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.S. Reflectories
Serial No. :	89559-5
Sweep Length :	.5-5
Sweep Delay :	.5-5
Pulse Length or Damping:	MIN
Frequency: 2.25 Filter:	3
Db Gain (fine):	24
Gain (coarse)	20

Examination Item/Weld	Recordable Indication Yes	No	Comments or Reason For Incompleted Scan(s)
3½" DIA		X	NO DISCONTINUITIES
BAR 48" LONG			DETECTED,
PO# 39352			NO LOSS of BACK
ITEM # 1			REFLECTION DETECTED

Scan Area	Calibration Checks	Time
0° Whaz	Initial Cal.	1120
0° Mat'l X	Intermediate	
Axial X	Intermediate	
Circ.	Final Cal.	1215

Ident.	Depth In.	Amp %	Atten. dB
T	3½"	75	44

1493 136

Additional Sheet Attached (check box)

Continuation	/	Beam Plot	/

Examiner(s)

1. [signature] TC-1A Level
2. _____ TC-1A Level

Date: 4 SEPT 1977

Reviewed: _____

Name THOMPSON, CLYDE W LIAM

Birth Date 10-13-42 (Jaeger Type J-1 tters)

Distant Vis.on Near Vision Colorvision Optometrist

Date	Uncorrect LE	Uncorrect RE	Correct LE	Correct RE	Uncorrect LE	Uncorrect RE	Correct LE	Correct RE		
5-31-72	20/40		20/20		J1	J1			Normal	Fred W Marsh
Oct-8-76	20/20	20/20			J1	J1			Normal	Fred W Marsh
1/21/77	20/20	20/20			J-1	J-1			Normal	F. Marsh

Education, Name of School		Length, Date's Attended		Subj's. Studied
Grammer School	Worthington, Ohio	3 yrs.	6-56	General
High School	Hilliard, Ohio	4 yrs.	6-60	Industrial Arts
College				
Tech.School	Chanute AFB	13 mon.	7-70	NDT
Correspondence	Air University Extention Course	5 mon.	7-71	NDT

N.D.T. School and Courses	Date's		Subject
Chanute AFB	3 months	7-70	NDT
Air University Extention Course	6 months	7-71	NDT

Experince, Training, Type	Date's		Level	
N D Inspection U.S.A.F.	1967 to	19 Oct-71	Inspector (Staff Sgt.)	
Isotope Radiographic Cert	8-5-72			Frd. 192, Co 60
Conam Inspection, Cols, OH	4-5-72	to 2-20-73	II	RT;MT;PT;UT
Conam Inspection, Rahway NJ	2-23-	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

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

CONAM INSPECTION, Cols. OH Div.
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 Clyde Wm Thompson DATE 2-77

Issued: 5-3-76
Revision: Issued:

99-CWTP-001

CERTIFICATIONS				EXAM SCORES				TNG	RECERTIFICATIONS		
METHOD	LEVEL	DATE	EXAMINER	GEN	SPEC	PRAC	COMP	HRS	DATE/EXAMINER	DATE/EXAMINER	DATE/EXAMINER
RT	II	1-77	Robt. Foster	82.5	90	95	90	240	2-77 RTF		
MT	II	1-77	Robt. Foster	77	82.5	100	88	80	2-77 RTF		
PT	II	1-77	Robt. Foster	86.6	72	95	86	80	2-77 RTF		
UT	II	1-77	Robt. Foster	90	73-3	100	89	120	2-77 RTF		

EXPERIENCE FROM	TO (MO/YR)	COMPANY	NDT METHODS & HIGHEST LEVEL ATTAINED
1967	10-71	USAF	NDT - Inspector (Staff Sgt.)
1972	73	Conam Inspection	Cols. OH RT:MT:PT:UT - Level II
73	64	Conam Inspection	Rahway NJ -RT, MT:PT:UT - Level II
74	75	Aerospace Mat.	Cols. OH - QC Mgr. RT, M PT, UT -Level III
76	present	Conam Inspection	Cols. OH -RT, MT, PT, UT -Level II

EYE EXAMINATIONS DATE	EXAMINED BY	
1-12-77	F. Marsch	D see attached

EDUCATION AND TRAINING (HIGHEST PUBLIC, ADVANCED AND NDT) SCHOOL	LOCATION	DATE	LENGTH	SUBJECT
Worthington	Ohio	6-56	3 yrs	General
Hilliard,	Ohio	6-60	4 yrs	Industrial Arts
Chanute AFB	IL	7-70	3 mos.	NDT
Air Univ. Extention Course		7-71	6 mos.	NDT

1495 138

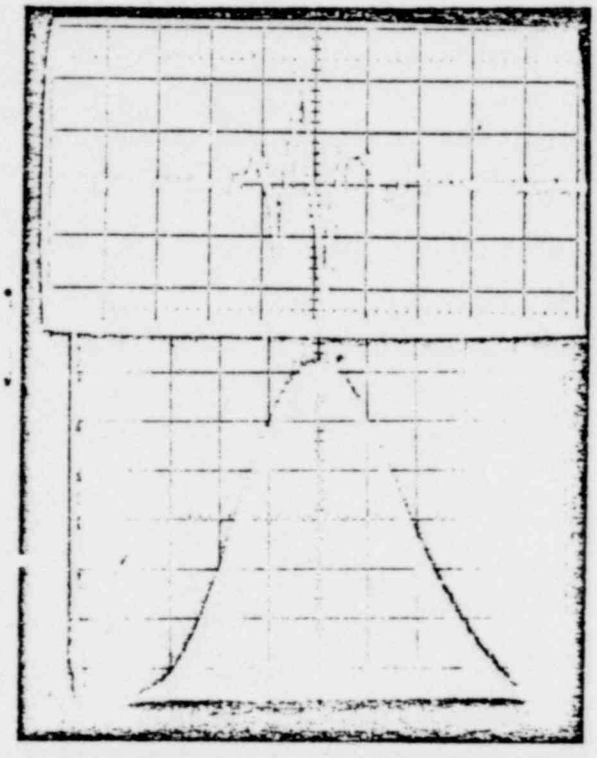
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 26496

MARKED FREQUENCY: 5.0 MHz SIZE: .25"

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 5.0 MHz (1.0 MHz/Division)

Transducer Central Frequency 5.0 MHz

1493 139

[xx] Acceptable

[__] Unacceptable

Interpretation By F.T. CARR 8/1/75

BRANCH OFFICE
WENCOTE P. O. BOX 13
207 GLENSIDE AVENUE
WENCOTE, PENNA. 19095
(215) 884-5498

International Testing Laboratories, Inc.
Materials Testing and Consulting Engineers
Weighers, Samplers and Assayers
578 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.

David H. Hoffman

ITL 112B REV. 20M 8-75

NUCLEAR ENERGY SVCS

CONAM INSPECTION INC.
1385 WITHERSPOONE ST
RAHWAY NEW JERSEY

U.J. REFLECTOSCOPE:
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

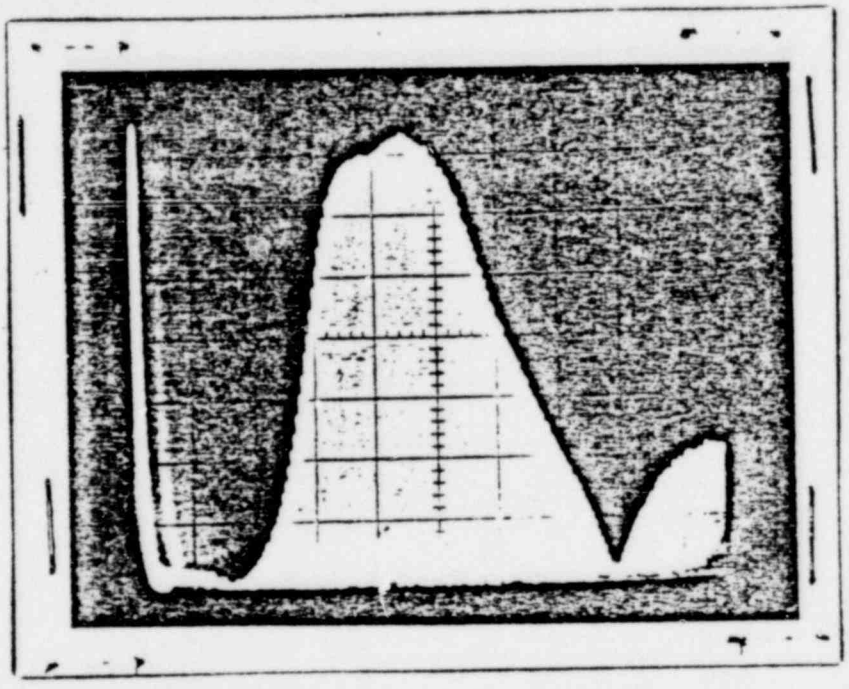
NUCLEAR ENE[illegible] / SERVICES, INC.
CONAM INSPECTION DIVISION
1365 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 46111

MARKED FREQUENCY: 2.25 MHz SIZE: .5" diameter

DATA SUPPLIED BY: Automation Industries



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.25 MHz

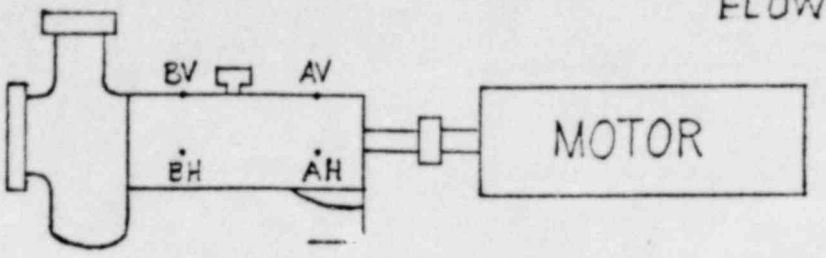
[XXX] Acceptable

[ ] Unacceptable

1493 142

Interpretation By F. T. Carr 8/26/77

DATA TAKEN: 9/5/77
TAKEN BY: G. M. STAUDT
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	.03	.01

Attachment #2
Met-Ed
GQL 1234 9/8/77

Babcock & Wilcox

Power Generation Group

P.O. Box 1260, Lynchburg, Va. 24505
Telephone: (804) 384-5111

September 8, 1977

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

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 phenonema 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.

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.

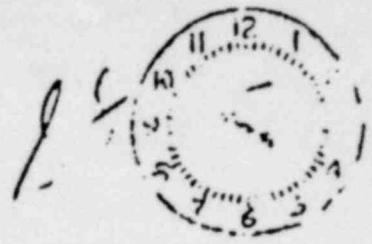
Very truly yours,

J. D. Phinney, 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

Attachment #3
Met-Ed
GQL 1234 9/8/77



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BABWILCOX LURG

WORTHGTN HSON

U R G E N T

SEPT 8 HARRISON NJ 032 1080
ATTN DON WOOD / STAN FUNKHAUSER
RE CONVERSATIONS MET ED TMI WE FEEL THAT 8 HN-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 80
HOURS WHICH IS EQUIVALENT TO 40 YEAR LIFE. WE HAVE HAD EXCELLENT
OPERATION WITH THIS PRODUCT LINE AND THIS INFLUENCES THIS
DECISION

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

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