



CONNECTICUT YANKEE ATOMIC POWER COMPANY

BERLIN, CONNECTICUT

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September 29, 1980

Docket No. 50-213

A01043

Director of Nuclear Reactor Regulation
Attn: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

- References:
- (1) D. G. Eisenhut letter to D. C. Switzer dated October 11, 1979.
 - (2) W. G. Council letter to D. G. Eisenhut dated December 4, 1979.
 - (3) D. M. Crutchfield letter to W. G. Council dated May 7, 1980.
 - (4) W. G. Council letter to D. M. Crutchfield dated June 10, 1980.

Gentlemen:

Haddam Neck Plant
Auxiliary Feedwater Systems -
Additional Short-Term Recommendation No. 2

Reference (1) advised the Connecticut Yankee Atomic Power Company (CYAPCO) of Staff requirements for the Auxiliary Feedwater Systems at the Haddam Neck Plant. Reference (1) also forwarded Additional Short-Term Recommendation No. 2, which required that a 72-hour endurance test be performed on all Auxiliary Feedwater System pumps. Parameters which were to be monitored to ensure that they remained within design limits were bearing and bearing oil temperatures, vibration, and pump room ambient conditions.

Reference (2) furnished CYAPCO's responses to the Staff requirements of Reference (1). Specifically, CYAPCO's response to Additional Short-Term Recommendation No. 2 maintained that the significant financial impact associated with this recommendation would far exceed the benefits with respect to reliability verification due to the fact that the auxiliary feedwater pumps had already been operated reliably for extended periods of time at hot standby as a result of normal plant operations. CYAPCO also stated that the operating history of the Haddam Neck Plant Auxiliary Feedwater System was being reviewed and that the appropriateness of supplemental endurance tests would be addressed at a later date.

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Reference (3) forwarded the Staff review of CYAPCO's Reference (2) responses. Via Reference (3), Additional Short-Term Recommendation No. 2 was revised such that a 48-hour pump endurance test was required rather than a 72-hour test. Reference (3) also forwarded the required test conditions and the data to be submitted to the Staff.

In Reference (4), CYAPCO advised that although the auxiliary feedwater pumps had been operated for extended periods of time, it was not possible to provide the required documentation. Therefore, CYAPCO intended to monitor pump performance and test conditions during startup from the recent refueling outage. The endurance test was performed during startup from the 1980 refueling outage and the test results are included in Attachment 1. Flow schematic diagrams are also included.

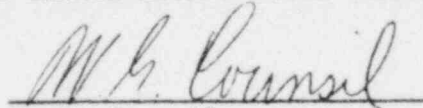
Pump bearing temperatures were maintained well within the 180°F design limits set by the pump manufacturer. Bearing temperatures were measured by contact with the pump casing near the bearings. Design limits for the turbine specify that bearing cooling water temperature be maintained less than 180°F, however, the turbine bearings may operate up to 240°F without damage. The test results in Attachment 1 show that these limits were not exceeded.

The auxiliary feedwater pumps were operated at design operating conditions for pump discharge pressure and speed, but at a lower turbine steam pressure, and thus, a lower flow rate. The pump discharge was directed back to the Demineralized Water Storage Tank (DWST), thus, accounting for the slight rise in DWST temperature at the start of the run. Pump room ambient conditions did not exceed environmental qualification limits for safety-related equipment in the room. Although it was not possible to provide all the data points requested by the Staff during the conduct of the test, adequate information was obtained to fulfill the intent of the Staff requirement.

We trust you will find this information responsive to resolve this matter; no further action is planned.

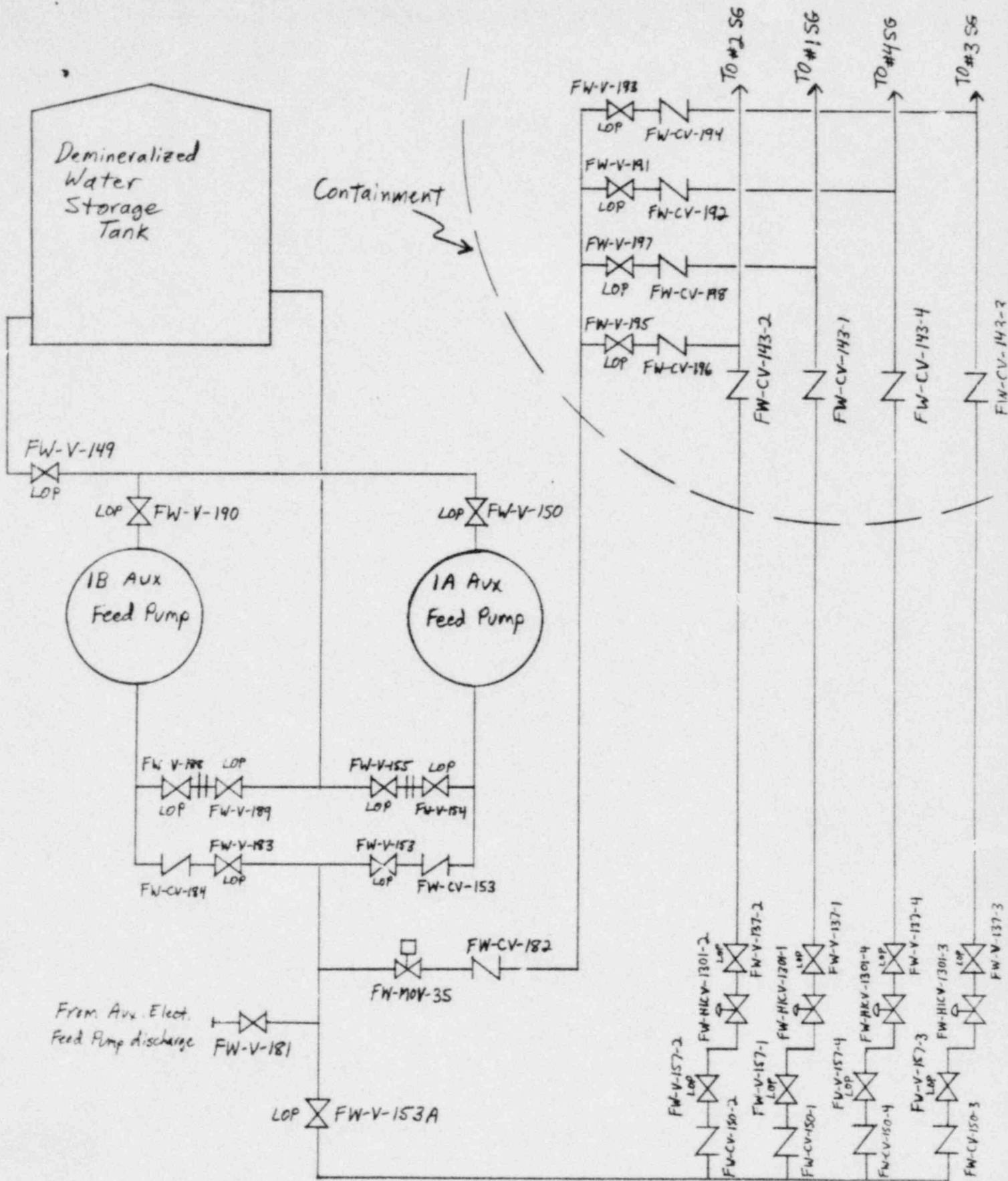
Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

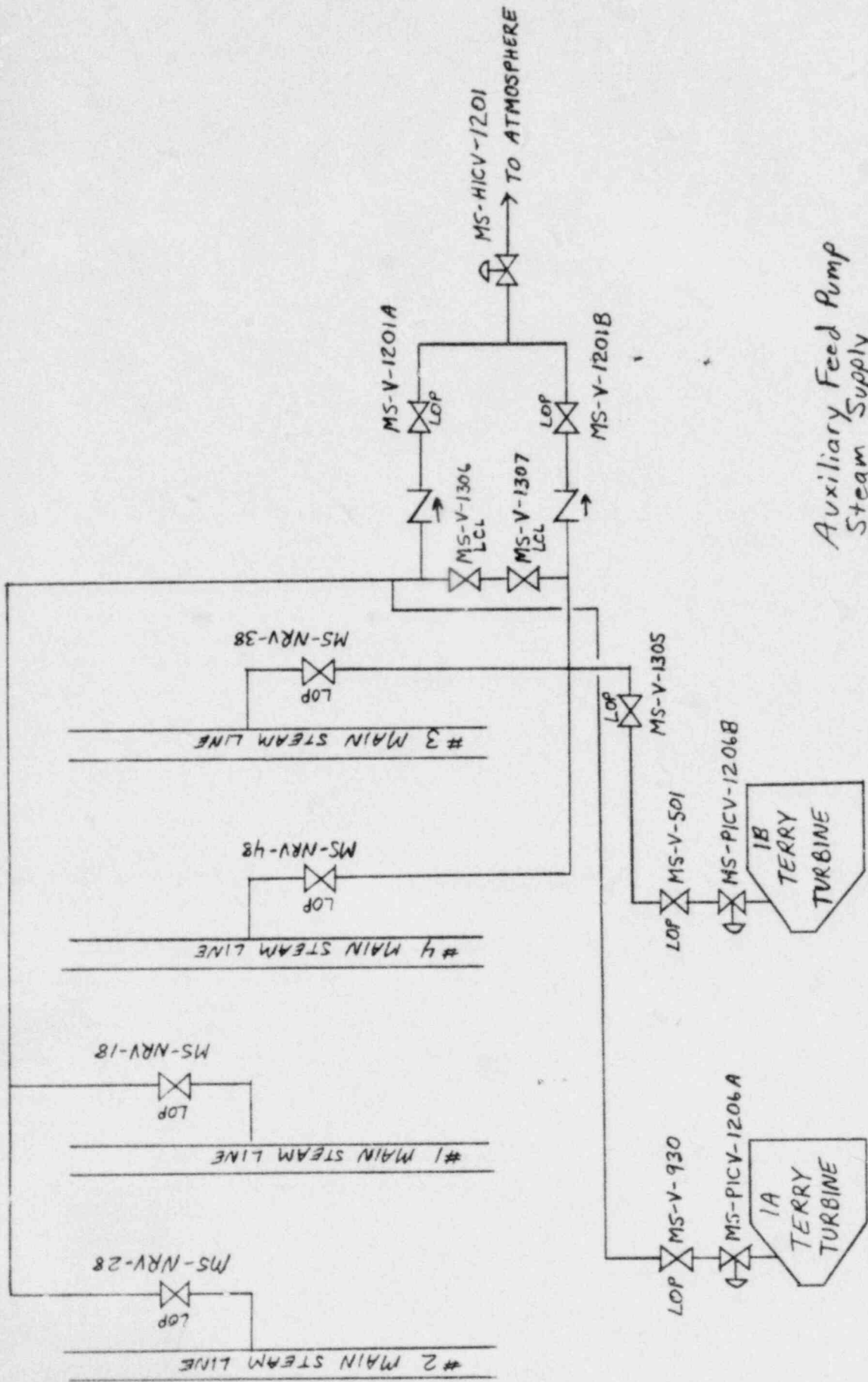


W. G. Council
Senior Vice President

Attachment



Auxiliary Feedwater Lineup



POOR ORIGINAL

Date _____
Shift Supervisor _____

Operator _____
Operator _____

Vibration in Mills	7/15/74	7/16/74	TIME
A Terry Turbine RPM	1.50	1.40	
Terry Turbine RPM	2000	2500	
A IT Inboard Vib. V	1.4	1.4	
A IT Inboard Vib. H	1.6	1.6	
A IT Outboard Vib. V	1.95	3.2	
A IT Outboard Vib. H	1.2	1.8	
IT Inboard Vib. V			
IT Inboard Vib. H			
IT Outboard Vib. V			
IT Outboard Vib. H			
A FP Inboard Vib. V	2	1.2	
A FP Inboard Vib. H	.92	1.6	
A FP Outboard Vib. V	2.1	1.5 ^(1.3)	
A FP Outboard Vib. H	1.7	1.0 ^(1.0)	

AUXILIARY FEED PUMP

Date _____

Shift Supervisor _____

Operator _____

Operator _____

731

Turbine Steam Press.	167°								
Pump Disch. Press.	85								
Turbine Inboard Bearing Temp.	112°								
Turbine Outboard Bearing Temp.	167								
1 Turbine Inboard Bearing Temp.	160								
1 Feed Pump Bearing Temp. 6143	125								
2 Feed Pump Bearing Temp. 6143	145								
3 Turbine Steam Press.									
1 Pump Disch. Press.									
1 Turbine Inboard Bearing Temp.									
1 Turbine Outboard Bearing Temp.									
2 Feed Pump Inboard Bearing Temp.									
2 Feed Pump Outboard Bearing Temp.									
3 Feed Pump Inboard Bearing Temp.									
3 Feed Pump Outboard Bearing Temp.									
3 Feed Pump Inboard Bearing Temp.									
3 Feed Pump Outboard Bearing Temp.									
Calorized Water Tk. Temp.	80								
Calorized Water Tk. Level									
Turbine Room Temp./Dew PT	110/80								

AUXILIARY FEED PUMP ENDURANCE TEST DATA

Date _____
 Shift Supervisor _____

Operator _____

Operator _____

	TIME
Vibration in Mills	
A Terry Turbine RPM	4150
B Terry Turbine RPM	
A TT Inboard Vib. V	
A TT Inboard Vib. H	
A TT Outboard Vib. V	3.8
A TT Outboard Vib. H	2.7
B TT Inboard Vib. V	
B TT Inboard Vib. H	
B TT Outboard Vib. V	
B TT Outboard Vib. H	
A FP Inboard Vib. V	1.6
A FP Inboard Vib. H	2.1
A FP Outboard Vib. V	1.4
A FP Outboard Vib. H	2.6

7/31

Block

AUXILIARY FEED PUMP ENDURANCE TEST DATA

8/7-8/8/80
Date

PT
Shift Supervisor

Operator

TIME

Operator

Prior to Test
After SMT

(18)

POOR ORIGINAL

	+1	+3	+5	+7	+9	+11	+13	+15	+17	+19	+21	+23	+25	+27
A Turbine-Steam Press	0500 0510	0615 0815	1015 1215	1415 1615	1815 2015	2215 0015	0215 0415	0615 0815						
A Pump Disch. Press														
A Turbine-Inboard-Bearing-Temp.														
A Turbine-Outboard-Bearing-Temp.														
A Feed-Pump-Bearing-Temp.														
A Feed-Pump-Bearing-Temp.														
B Turbine Steam Press. PSIG	X 310	300 295	300 300	295 300	300 300	300 300	300 300	300 300	300 300	300 300	300 300	300 300	300 300	300
B Pump Disch. Press. PSIG	X 980	930 945	945 950	950 940	945 940	940 940	940 940	940 940	940 940	940 940	940 940	940 940	940 940	940
B Turbine Inboard Bearing Temp. °F				NOT TAKEN										
B Turbine Outboard Bearing Temp. °F	166	180 160	190 196	198 199	199 197	197 197	197 197	199 199	198 198	194 194	194 194	193 194	194 194	197
B Feed Pump Inboard Bearing Temp. °F	110	140 130	122 124	130 136	131 130	128 128	130 130	128 128	128 128	124 124	121 121	121 121	122 122	123
B Feed Pump Outboard Bearing Temp. °F	109	124 140	142 143	146 146	141 140	141 141	140 140	141 141	140 140	138 138	137 137	137 137	137 137	145
Deminerlized Water Tk. Temp. °F	94	94 93	95 95	99 99	99 99	99 99	95 95	93 93	96 96	97 97	91 91	90 90	90 90	92
Deminerlized Water In. Level K	87.5	84 81	81 81	87 87	87 87	87 87	86 86	86 86	80 80	80 80	84 84	85 85	84 84	80
Terry Turbine Room Temp. °F	X	106/105	110/105	112/110	110/110	114/114	118/118	120/120	117/117	110/110	109/109	108/108	108/108	109/109

AUXILIARY FEED PUMP ENDURANCE TEST DATA

(00-08) (08-16) (16-24) (8-7-80) (8-7-80)
 M. EWARS; K. CAPOCUS; J. HOCHENDORFF
 Operator (08-16) (8-8-80)
 R. REILLY; W. BOSMAN

8/7-8/8/80
Date

Date

Shift Supervisor

PRIOR TO START
AFTER START

Vibration in Mills	TIME																	
	+1	+3	+5	+7	+9	+11	+13	+15	+17	+19	+21	+23	+25	+27				
A-Terry-Turbine-RPM	0500	0510	045	0815	1015	1215	1415	1615	1815	2015	2215	0015	0215	0415	0615			
B Terry Turbine RPM	X	3820	3750	3700	3750	3730	3750	3700	3750	3750	3750	3750	3750	3750	3750			
A-TT-Inboard-Vibr-V																		
A-FT-Inboard-Vibr-H																		
A-TT-Outboard-Vibr-V																		
A-TT-Outboard-Vibr-H																		
B TT Inboard Vib. V V_2	X	.17	.10	.11	.13	.12	.12	.12	.12	.12	.10	.10	.10	.10	.10	.10	.10	.10
B TT Inboard Vib. H $\frac{1}{2}$	X	.13	.11	.13	.14	.14	.13	.12	.11	.12	.13	.14	.13	.15	.12	.14		
B TT Outboard Vib. V V_3	X	.06	.065	.055	.058	.06	.061	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
B TT Outboard Vib. H V_3	X	.05	.048	.044	.042	.045	.04	.04	.04	.04	.05	.04	.04	.04	.04	.04	.04	.04
A-FP-Inboard-Vibr-V																		
A-FP-Inboard-Vibr-H																		
A-FP-Outboard-Vibr-V																		
A-FP-Outboard-Vibr-H																		

(1B)

POOR ORIGINAL

(18)

AUXILIARY FEED PUMP ENDURANCE TEST DATA

(08-16) (16-24)
W. GOSNAN, J. WASTHAGEN (8-8-80)

Date

8/8-8/9/80

Operator

C. CANELLA (00-08) (8-9-80)

Shift Supervisor

TIME

Operator

	+29	+31	+33	+35	+37	+39	+41	+43	+45	+47											
A-Turbine-Stream-Press	1015	1215	1415	1615	1815	2015	2215	0015	0215	0415											
A-Pump-Disch-Press																					
A-Turbine-Inboard-Bearing-Temp																					
A-Turbine-Outboard-Bearing-Temp																					
A-Feed-Pump-Bearing-Temp																					
A-Feed-Pump-Bearing-Temp																					
B Turbine Steam Press. PSIG	300	300	300	300	300	300	300	300	300	300											
B Turbine Steam Press. PSIG	950	940	940	940	940	940	940	940	940	940											
B Turbine Inboard Bearing Temp. °F			160																		
B Turbine Outboard Bearing Temp. °F	200	200	203	203	203	205	205	205	205	190	189										
B Feed Pump Inboard Bearing Temp. °F	128	130	132	132	132	132	132	142	145												
B Feed Pump Outboard Bearing Temp. °F	145	142	141	142	142	147	150	152	151	151	152										
Demineralized Water Tk. Temp. °F	98	96	97	95	97	100	100	100	88	89											
Demineralized Water Tk. Level %	77	80	85	81	76	75	73	73	74	77											
Terry Turbine Room Temp. °F	112	115	119	119	119	119	119	119	115	115	115	112	112	112	112	112	112	112	112	112	112

NOT TAKEN

JUN 26 1980

8/8-8/9/80

Date

18

Operator

Shift Supervisor

R.P. Smith

TIME

Vibration in Mills	Operator									
	+29	+31	+33	+35	+37	+39	+41	+43	+45	+47
S.F.P. Inboard Vib. V	.1015	1215	1415	1615	1815	2015	2215	0015	0215	0415
Inboard Vib. H										
S.F.P. Outboard Vib. V	.14	.14	.15	.14	.14	.14	.15	.14	.14	.16
S.F.P. Outboard Vib. H	.22	.22	.2	.18	.19	.20	.20	.20	.20	.20