6

Stone & Webster Engineering Corporation
Cherry Hill Operations Center
Cherry Hill, New Jersey
I
NUCLEAR SAFETY RELATED

J.O.No. 12177 | Addendum 6 to Revision 2
Spec. No. NMP2-P304R | Page A6-1 of 18
Date: November 30, 1983

Addendum 6 to Revision 2
Specification for

<u>MOTOR-OPERATED CARBON STEEL VALVES</u>
<u>ASME III, CLASSES 1, 2, AND 3</u>

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

Seller:
Velan Engineering Companies

APPROVED

	Name	Date
Preparer	[illegible]	11/30/83
Lead Engr	[illegible]	11/30/83
Specialist	See E&DCR TBH	11/30/83
Proj Engr	[illegible]	11/30/83
Qual Assur	[illegible]	11/30/83
Mtrls Engg	See E&DCR TBH	11/30/83
Const Dept	NA (TBH)	–
Indep Review	See E&DCR TBH	11/30/83

This design specification is hereby certified to be complete, correct, and in compliance with the ASME Boiler and Pressure Vessel Code, Section III, NA-3250, dated 7/1/74, and Addenda dated 6/30/74, 12/31/74, 6/30/75, and 12/31/75.

Signed: J. J. Panchison
Date: 11/30/83
Prof. Eng. State: N.Y.
Registration No.: 059375

This Addendum 6 to Revision 2 delineates changes to Revision 2 dated March 14, 1980, Addendum 1 to Revision 2 dated November 3, 1980, Addendum 2 to Revision 2 dated

February 9, 1981, Addendum 3 to Revision 2 dated 1.52
February 18, 1982, Addendum 4 to Revision 2 dated 1.53
November 2, 1982, and Addendum 5 to Revision 2 dated
November 2, 1983. This addendum also incorporates E&DCR 1.55
Nos. F01,145, P01,591, P01,597, P01,598, P01,633, P01,638, 1.56
P01,659, P01,670, P01,842, P01,864, P01,895, P12,327,
P12,356, P12,359, P12,484, and P12,518 and N&D No. PQA Z006 1.57
and lists "one time only" E&DCR No. P12,442 and N&D 1.58
Nos. FQC 3037, FQC 4121, FQC 4325, PQA G103, PQA Z002, 2.1
PQA Z050, PQA Z051, and PQA Z052 written against the 2.2
specification.

Item	Change to Specification	
1	Page: 1-12, after line 11.47	2.13
	Add:	2.14

All ASME III materials should be manufactured in accordance with the ASME III Code Edition and Addenda required by this specification (i.e., including the corresponding ASME II Code.) If the Seller cannot obtain materials certified by its suppliers to the specified ASME Code use of materials to later ASME III Code Editions/Addenda is authorized subject to the following provisions. The Seller shall first verify that materials for the later ASME III Code meet the requirements of the specified ASME III Code and document this verification on the CMTR or on a separate certification. If any of the requirements of the later ASME III Code do not meet the specified ASME III Code requirements, then the Seller shall either; 2.17 2.19 2.21 2.22 2.23 2.24 2.26 2.27 2.28 2.29

1. Perform those operations, tests, or inspections required to make the material meet the specified ASME III Code requirements (including the corresponding ASME II Code) and provide documented results and certifications on a CMTR. 2.31 2.32 2.33 2.34

2. Reconcile the material requirements of the later ASME III Code with the design requirements for the items being furnished and determine that all related requirements of the later ASME III code are met (NA/NCA-1140). This reconciliation and related requirements review shall include but is not limited to the following: 2.35 2.36 2.37 2.38

   a. Reconciling any revised material properties/characteristics of the later ASME II Code with applicable design requirements of the component/material. 2.40 2.41 2.42

   b. Verification that material complies with later ASME III Code NX-2000 requirements. 2.43

   c. Reconciling a change in allowable stress value in the later ASME III code with the design basis allowable stress value. 2.44 2.46

The Seller's performance of this reconciliation and related requirements review and assurance that the material used is acceptable shall be documented as follows: 2.48 2.49 2.50

1. Seller shall identify on the CMTR the later ASME III Code used against the ASME III Code 2.52

Item	Change to Specification	
	Edition/Addenda certified to on the Code Data Report.	2.53
2.	Seller shall indicate on the CMTR or on a separate certification that the review was performed and that the material used was found acceptable. In addition, where a design/stress report is not required to be revised, the Seller's certification shall also provide that the material used was reconciled against the stress/design report and that a revision of this report is not required.	2.54 2.55 2.57 2.58 3.1 3.3
3.	Where a design/stress report previously submitted to the Engineers must be revised because of the use of later ASME III Code material, the revised report shall be submitted to the Engineers.	3.4 3.5
	Reason: To incorporate E&DCR No. P01,842	3.7
2	Page: 1-12, after line 11.58	3.10
	Add: - ASME SA-350, LF2, may be used as an alternate material for ASME SA-105. -	3.11 3.12 3.13
	Reason: To incorporate E&DCR No. P12,359	3.14
3	Page: 1-12, line 12.2	3.17
	Delete: - and packing gland -	3.18
	Reason: To incorporate E&DCR No. P01,864	3.19
4	Page: 1-12, line 12.6, after the words "stainless steel"	3.22 3.23
	Add: - , SA 654-630, which shall be solution treated and age hardened to 1,100°F -	3.24 3.25 3.26
	Reason: To incorporate E&DCR No. P01,864	3.27
5	Page: 1-21, line 19.4	3.30
	Delete: - and equations -	3.31
	Add: - and (optionally) equations -	3.32
	Reason: To incorporate E&DCR No. P12,356	3.33

Item	Change to Specification	
6	Page:	1-40
	Delete:	Lines 34.43 through 34.47
	Add:	

Spare or replacement parts shall meet all the technical requirements of this specification; however, inspection and documentation requirements for spare and replacement parts shall be in accordance with Code Case N62-2.

Reason: To incorporate E&DCR No. F01,145

7	Page:	1-47
	Delete:	Lines 40.26 through 40.41
	Add:	

Hydrostatic Tests

All valves shall be hydrostatically tested by the Seller for shell and disc structural integrity. The shell hydrostatic test shall be in accordance with:

1. Subarticle NB-3500 and Article NB-6000 for ASME III Code Class 1 valves.
2. Subarticle NC-3500 and Article NC-6000 for ASME III Code Class 2 valves.
3. Subarticle ND-3500 and Article ND-6000 for ASME III Code Class 3 valves.

The disc hydrostatic test for structural integrity shall be in accordance with MSS-SP-61 for ASME III Code Class 1, 2, and 3 valves.

The shell hydrostatic test for globe and gate valves shall be conducted with the valve open but not backseated. Following the test, the valve shall be backseated and the packing and stuffing box inspected for leakage.

For globe valves, the under-the-seat hydrostatic seat-tightness test shall be performed at not less than 115 percent of the maximum differential pressure specified on the Motor-Operated Valve Data Sheet by Engineers. For valves tested through May 31, 1983, the nominal pressure for which the hydrostatic seat-tightness test is performed may be recorded in lieu of the actual pressure at which the test is performed. For valves tested after May 31, 1983, the actual pressure at which the hydrostatic seat-tightness test is performed shall be recorded.

Item Change to Specification

For gate valves, the hydrostatic seat-tightness test shall be performed at the maximum differential pressure specified on the Motor-Operated Valve Data Sheet by Engineers with a tolerance of ±10 percent. The actual pressure at which the hydrostatic seat-tightness test is performed shall be recorded.

Reason: To incorporate E&DCR No. P01,895

8 Page: 1-49, line 41.58
Delete: - voltage (Section 4.8) -
Add: - voltage (Section 4.8). Test is not applicable to dc motors. -
Reason: To incorporate E&DCR No. P01,659

9 Page: 1-57, after line 49.57
Add:

43. Hydrostatic Seat-Tightness Test

Verify that the actual or nominal pressure has been recorded and meets the requirements under TESTS.

Reason: To incorporate E&DCR No. P01,895

10 Page: THERMAL TRANSIENT INDEX of Addendum 1 to Revision 2, under 12177-SK-A104
Add: - 2MSS*MOV207 -
Reason: To incorporate E&DCR No. P12,484

11 Page: A4-4 of Addendum 4 to Revision 2
Delete: Lines 5.9 and 5.10
Add:

Hydrostatic Disc Test Reports - - - 1 -

Reason: To incorporate E&DCR No. P01,895

12 Page: A4-4 of Addendum 4 to Revision 2, after line 5.10
Add:

Hydrostatic Seat-Tightness Test Reports - 2 - 1 -

Reason: To incorporate E&DCR No. P01,895

Item	Change to Specification	
13	Page:	A4-6
	Delete:	Line 7.9
	Add:	
Form OSHA-20 for Asbestos		4 - - 1 -
	Reason:	To incorporate E&DCR No. P01,670
14	Page:	A4-8 (0-2), line 8.12
	Add:	

E&DCRs	N&Ds
P12,442	FQC 4121
	FQC 4325
	PQA Z002
	PQA Z050
	PQA Z051
	PQA Z052
	PQA G103

	Reason:	List "one time only" changes
15	Page:	A5-1
	Delete:	- PQA Z030 -
	Reason:	Editorial change
16	Page:	A5-2, line 2.44
	Delete:	- P01,233 -
	Add:	- P01,233 and N&D No. PQA Z006 -
	Reason:	To incorporate N&D No. PQA Z006
17	Page:	A5-5
	Delete:	Line 5.29
	Add:	
To As-Built Conditions		4 2 - 1 -
	Reason:	In accordance with E&DCR No. P01,436
18	Page:	VALVE DATA SHEETS
	Delete:	Pages 4-3G, 4-3W, 4-3UU, 4-3QQQ, and 4-3MMMM of Revision 2, 4-3TTTTT of Addendum 2 to Revision 2, and 4-3BBBBBB, 4-3DDDDDD, 4-3EEEEEE, and 4-3FFFFFF of Addendum 4 to Revision 2

Item	Change to Specification	
	Add: Revised Data Sheets, pages 4-3G,	6.6
	4-3W, 4-3UU, 4-3QQQ, 4-3MMMM,	6.7
	4-3TTTTT, 4-3BBBBBB, 4-3DDDDDD,	6.8
	4-3EEEEEE, and 4-3FFFFFF,	6.9
	all dated November 23, 1983	6.10
	Reason: To incorporate E&DCR Nos. P01,591,	6.11
	P01,598, P01,633, P01,638,	6.12
	P12,327, P12,484, and P12,518	6.13

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 30
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE 11/23/83

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

	S & W Mark No.	2 MSI - MOV 2A	2 MSI - MOV 2B
	Valve		
	Quantity	One	One
	Size	3 Inch	3 Inch
	Type	Gate	Gate
	Service	Shutoff	Shutoff
	Fluid	Water	Water
	S & W Description No.	VGW060 - C - 1MQ	VGW060 - C - 1MQ
	Rating	600#	600#
	Material	SA105	SA105
	End Preparation	Butt Weld	Butt Weld
	Normal Oper. Press.-psi	275	275
	Max. Diff. Press.-psi	275	275
	Temperature Range - °F	100 - 585	100 - 585
	Maximum Flow	400 gpm	400 gpm
	Design Pressure - psig.	1440 | 6	1440 | 6
	Design Temperature - F	100	100
	Pipe Schedule	Sch. 80	Sch. 80
	"C" Bore	2.934"	2.934"
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	Cl. H(R)	Cl. H(R)
	Normal Ambient Temp.-C	65.5	65.5
	Location	Inside Pri. Containment	Inside Pri. Containment
	No. Limit Switch Contacts		
	Close	4 Open - 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
		2) Low Seat Leakage	2) Low Seat Leakage
		3) Inside Iso.	3) Inside Iso.
	REV. 3		
	REV. 2		
	REV. 1		

A6026.00

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 34
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 11/23/83

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible]

S & W Mark No.	2 CCP - MOV 22A	2 CCP - MOV 22B
Valve		
Quantity	One	One
Size	6 Inch	6 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW015-P-3KQ 16	VGW015 - P - 3KQ
Rating	150#	150#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	100	100
Max. Diff. Press.-psi	150	150
Temperature Range - °F	40 - 160	40 - 160
Maximum Flow	375 GPM	375 GPM
Design Pressure - psig.	200	200
Design Temperature - F	250	250
Pipe Schedule	Std.	Std.
"C" Bore	6.094"	6.094"
Trim	STELLITE	STELLITE
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE

REV. 3
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 300
SPEC. NO. NMP2-P 304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: HAB DATE 11/23/83

	2 ICS - MOV 129	2 ICS - MOV 136
S & W Mark No.	E51-F010	E51-F031
Valve		
Quantity	One	One
Size	6 Inch	6 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW015 - P - 2KEQ	VGW015 - P - 2KEQ
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	25	25
Max. Diff. Press.-psi	150	100 16
Temperature Range - °F	40 - 100	40 - 170
Maximum Flow	600 gpm	600 gpm
Design Pressure - psig.	100	100
Design Temperature - F	170	170
Pipe Schedule	Std.	Std.
"C" Bore	6.094"	6.094"
TRIM	STELLITE	STELLITE
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	120 ▼ dc	120 ▼ dc
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Welded transition piece required	2) Low Seat Leakage
	3) -Requirement deleted- 1	3) Outside Rso.
		4) Welded transition piece required
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - [illegible]
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE - 11/23/83

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY [illegible]

1	S & W Mark No.	2 ICS - MOV 121	2 - MOV
2	GE #	E61 - F064	
3	Valve		
4	Quantity	One	One
5	Size	10 Inch	
6	Type	Gate	
7	Service	Shutoff	
8	Fluid	Steam	
9	S & W Description No.	VGM090-F-1Z0	Intentionally
10	Rating	900#	left
11	Material	SA 105	blank
12	End Preparation	Butt Weld	
13	Normal Oper. Press.-psi	1140	
14	Max. Diff. Press.-psi	1158	
15	Temperature Range - F	70 - 560	
16	Maximum Flow	207,300 lb/hr	
17	Design Pressure - psig.	1250	
18	Design Temperature - F	575	
19	Pipe Schedule INLET	SCH 80	
20	OUTLET	SCH 100	
21	"E" Bore INLET	9.671"	
22	OUTLET	9.452"	
23			
24	TRIM	STELLITE	
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	
28	Insulation Class	Cl. B(3)	
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	Outside Pri. Containment	Pri. Containment
33			
34	No. Limit Switch Contacts		
35	Close	4 Open 4 Closed	4 Open 4 Closed
36	Open	4 Open 4 Closed	4 Open 4 Closed
37			
38			
39	Special Requirements	1) ACTIVE VALVE	
40		2) Low Seat Leakage	
41		3) Outside Iso.	
42		4) Time to Operate	
43		a) Close - 45 sec. (max)	
44		b) Open - 45 sec. (max)	
45			
46			
47			
48			
49			
50			
51			
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

A3016.00

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 of [illegible]
SPEC. NO. NMP2-P 304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible] DATE 11/23/83

	2 RHS - MOV 25A	2 RHS - MOV 25B
S & W Mark No.	E12-F017A	E12-F017A
GE #		
Valve		
Quantity	One	One
Size	16 Inch	16 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGWO30-G-2PDQ 16	VGWO30-G-2PDQ 16
Rating	300#	300#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	350	350
Max. Diff. Press.-psi	350	350
Temperature Range - °F	40 - 170	40 - 170
Maximum Flow	8400 gpm	8400 gpm
Design Pressure - psig.	500	500
Design Temperature - F	358	358
Pipe Schedule	XS	XS
"C" Bore	15.084"	15.084"
Trim	STELLITE	STELLITE
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	OUTSIDE Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Outside Iso.
REV. 3 PER INITIAL		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3TTTT
SPEC. NO. NMP2-P
J.O. NO. 12177
DATE 11/23/83

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: [illegible]

1	S & W Mark No.	2 IC5 - MOV 128 (E51 - F063)	
2			
3	Valve		
4	Quantity	ONE	
5	Size	10 INCH	
6	Type	GATE	
7	Service	SHUTOFF	
8	Fluid	STEAM	
9	S & W Description No.	VGW090-F-1MDQ12	
10	Rating	900#	
11	Material	SA 105	
12	End Preparation	BUTTWELD	
13	Normal Oper. Press. - psi	1140	
14	Max. Diff. Press. - psi	1158 [6]	
15	Temperature Range - F	70 - 560	
16	Maximum Flow	207,300 #/HR	
17	Design Pressure - psig	1250	
18	Design Temperature - F	575	
19	Pipe Schedule	SCH 80	
20			
21	Pipe Bore ("C" BORE)	9.671"	
22			
	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	RH	
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	INSIDE PRI. CONTAINMENT	
33			
34			
35	No. Limit Switch Contacts		
36	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
37	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
38			
39			
40			
41	Special Requirements (1)	ACTIVE VALVE	
42	(2)	LOW SEAT LEAKAGE	
43	(3)	INSIDE ISOLATION	
44	(4)	TIME TO OPERATE:	
45		a/ CLOSE 15 SEC (MAX)	
46		b/ OPEN 15 SEC (MAX)	
47	(5)	TEST CONN. REQ'D.	
48			
49			
50			
51			
52			
53			

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

PAGE 4-3BBBBBB R
SPEC. NO. NMP2-P304
J.O. NO. 12177
DATE 11/23/83

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels

S & W Mark No.	2CCP-MOV94A	2CCP-MOV94B
Valve		
Quantity	One	One
Size	4"	4"
Type	Gate	Gate
Service	Open/Close	Open/Close
Fluid	Demin. Water	Demin. Water
S & W Description No.	VGW01S-P-2KQ	VGW01S-P-2KQ
Rating & Material	150# / SA105	150# / SA105
End Preparation	Buttweld	Buttweld
Normal Operating Pressure - psi	150	150
Max. Diff. Press. - psi	150	150
Temp. Range - F	70 - 150°F	70 - 150°F
Max. Flow - gpm	400	400
Design Temperature	150°F	150°F
Design Pressure	225 psi	225 psi
Pipe Schedule	40	40
"B" Bore	4.026"	4.026"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power - Volts / Phase / Hz	575/3/60	575/3/60
Insulation Class	RH	RH
Normal Ambient Temp. - C	65.5	65.5
Location	Inside Prim. Cont.	Inside Prim. Cont.
No. of Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	Cv ≥ 760 Low Leakage End-to-End = 1'-2"	Cv ≥ 760 Low Leakage End-to-End = 1'-2"
REV. 3		
REV. 2		
REV. 1		

A 5038 60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

PAGE 4-3DDDDDD
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 11/23/83

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HdeJ

	2CCP-MOV15A	2CCP-MOV15B
S & W Mark No.		
Valve		
Quantity	One	One
Size	4"	4"
Type	Gate	Gate
Service	Open/Close	Open/Close
Fluid	Demin. Water	Demin. Water
S & W Description No.	VGW015-P-2KQ 6	VGW015-P-2KQ 6
Rating & Material	150# / SA105	150# / SA105
End Preparation	Buttweld	Buttweld
Normal Operating Pressure - psi	100	100
Max. Diff. Press. - psi	150	150
Temp. Range - F	70 - 150°F	70 - 150°F
Max. Flow - gpm	400	400
Design Temperature	150°F	150°F
Design Pressure	225 psi	225 psi
Pipe Schedule	40	40
"B" Bore	4.026" 6	4.026" 6
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power - Volts / Phase / Hz	575/3/60	575/3/60
Insulation Class	RH	RH
Normal Ambient Temp. - C	65.5	65.5
Location	Inside Prim. Cont.	Inside Prim. Cont.
No. of Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	Cv ≥ 760	Cv ≥ 760
	Low leakage	Low leakage
	End-to-End ≤ 1'-2"	End-to-End ≤ 1'-2"
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

PAGE 4-3EEEEEE
SPEC. NO NMP2-P304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: [illegible] DATE 11/23/83

S & W Mark No.	2CCP-MOV16A	2CCP-MOV16B
Valve		
Quantity	One	One
Size	4"	4"
Type	Gate	Gate
Service	Open/Close	Open/Close
Fluid	Demin. Water	Demin. Water
S. & W Description No.	VGW015-P-2KQ 6	VGW015-P-2KQ 6
Rating & Material	150# / SA105	150# / SA105
End Preparation	Buttweld	Buttweld
Normal Operating Pressure - psi	150	150
Max. Diff. Press. - psi	150	150
Temp. Range - F	70 - 150°F	70 - 150°F
Max. Flow - gpm	400	400
Design Temperature	150°F	150°F
Design Pressure	225 psi	225 psi
Pipe Schedule	40	40
"B" Bore	4.026" 6	4.026" 6
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power - Volts / Phase / Hz	575/3/60	575/3/60
Insulation Class	RH	RH
Normal Ambient Temp. - C	65.5	65.5
Location	Outside Prim. Cont.	Outside Prim. Cont.
No. of Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	Cv ≅ 760	Cv ≅ 760
	Low leakage	Low leakage
	End-to-End =	End-to-End =
	1'-2"	1'-2"
REV. 3		
REV. 2		
REV. 1		

A3036 60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

PAGE 4-3FFFFFF
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 11/23/83

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HRdeS

	S & W Mark No.	2CCP-MOV17A	2CCP-MOV17B
	Valve		
	Quantity	One	One
	Size	4"	4"
	Type	Gate	Gate
	Service	Open/Close	Open/Close
	Fluid	Demin. Water	Demin. Water
	S & W Description No.	VGW015-P-2KQ [6]	VGW015-P-2KQ [6]
	Rating & Material	150# / SA105	150# / SA105
	End Preparation	Buttweld	Buttweld
	Normal Operating Pressure - psi	100	100
	Max. Diff. Press. - psi	150	150
	Temp. Range - F	70 - 150°F	70 - 150°F
	Max. Flow - gpm	400	400
	Design Temperature	150°F	150°F
	Design Pressure	225 psi	225 psi
	Pipe Schedule	40	40
	"B" Bore	4.026" [6]	4.026" [6]
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power - Volts / Phase / Hz	575/3/60	575/3/60
	Insulation Class	RH	RH
	Normal Ambient Temp. - C	65.5	65.5
	Location	Outside Prim. Cont.	Outside Prim. Cont.
	No. of Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	Cv ≥ 760	Cv ≥ 760
		Low Leakage	Low Leakage
		End-to-End ≤ 1'-2"	End-to-End ≤ 1'-2"
	REV. 3		
	REV. 2		
	REV. 1		

I

NUCLEAR SAFETY RELATED

J.O. No. 12177 | Addendum 5 to Revision 2
Spec. No. NMP2-P304R | Page A5-1 of 10

Addendum 5 to Revision 2 | November 2, 1983
Specification for

MOTOR-OPERATED CARBON STEEL VALVES
ASME III, CLASSES 1, 2, AND 3

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

Seller:
Velan Engineering Corporation

STATE OF NEW YORK
JOSEPH J. PANCHISON
No. 059375
LICENSED PROFESSIONAL ENGINEER

This design specification is hereby certified to be complete, correct, and in compliance with the ASME Boiler and Pressure Vessel Code, Section III, NCA-3250, dated 7-1-74 and Addenda dated 6-30-74, 12-31-74, 6-30-75, and 12-31-75

APPROVED	Name	Date
Preparer		
Lead Engr		
Specialist		
Proj Engr		
Qual Assur		
Mtrls Engg		
Const Dept		
Indep Review		

Signed: J J Panchison
Date: 10-19-83
Prof. Eng. State: N.Y.
Registration No.: 059375

This Addendum 5 to Revision 2 delineates changes to Revision 2 dated March 14, 1980, Addendum 1 to Revision 2 dated November 3, 1980, Addendum 2 to Revision 2 dated February 9, 1981, Addendum 3 to Revison 2 dated February 18, 1982, and Addendum 4 to Revision 2 dated November 2, 1982. This addendum also incorporates E&DCR Nos. P00,718, P01,489 (cancels P00,718), P01,436, P01,428, P01,233, and P01,416 and N&D No. G-026 and lists "one time only" E&DCR Nos. P01,197, V10,305, V10,329, V10,357, V10,413, V10,559, V10,572, and N&D Nos. FQC 1957, FQC 1958, FQC 2365, FQC 2626, FQC 3171, FQC 4486, PQA G054, and PQA Z030 written against the specification.

Item	Change to Specification	
1	Page: 1-11	2.9
	Delete: Lines 10.58 to 11.1 in their entirety	2.10 2.11
	Add:	2.12

Each ASME III, Class 1, stress report requires two submittals by the Seller. 2.16 2.17

1. First submittal prior to the start of fabrication for Engineers' approval. 2.20

2. Second submittal (after fabrication is completed) reconciled to the as-built condition. Upon the Engineers' review and approval of the second submittal, a Purchaser's certification is then issued by the Engineers. Code stamping and subsequent shipment shall not take place prior to approval of the second submittal. In any case, where the Seller has code-stamped and shipped prior to submittal approval, as-built design reports shall be submitted. 2.21 2.22 2.23 2.25 2.27 2.28

Reason: E&DCR No. P01,436 2.30

2	Page:	1-12, line 12.3	2.32
	Delete:	- SA-193, Grade B7 -	2.33
	Add:	- SA-193, Grade B7, or SA-564-630, which shall be solution treated and age hardened at 1,100°F -	2.34 2.35 2.36 2.37
	Reason:	Vendor request	2.38
3	Page:	1-12, after line 12.7, after 1100°F	2.41
	Add:	- , or ASME SA 479, Grade 410, Class 1 or Class 2. -	2.42 2.43
	Reason:	E&DCR No. P01,233	2.44
4	Page:	1-47, after line 40.41	2.47
	Add:		2.48

For gate valves, the hydrostatic seat tightness test shall be performed at the maximum differential pressure specified on the motor-operated valve data sheet by Engineers with a tolerance of ±10 percent. 2.52 2.54 2.56 2.57

Reason: E&DCR No. P01,416 3.1

Item	Change to Specification	
5	Page: 1-49, after line 42.24	3.4
	Add:	3.5

Except for valves listed below, the 110 percent voltage test 3.10
is waived for all valves tested at 100 percent voltage prior 3.13
to February 20, 1981.

2RHS*MOV142	2WCS*MOV108	3.16
2MSS*MOV1A&B	2RHS*MOV104	3.17
2MSI*MOV2A&B	2ICS*MOV121	3.18
2CCP*MOV4A&B	2CSL*MOV104	3.19
2CCP*MOV5A&B	2FWS*MOV21A&B	3.20
2RHS*MOV33A&B	2CCP*MOV265	3.21
2WCS*MOV200	2ICS*MOV128	3.22

Reason: N&D No. G-026 3.24

6	Page: 1-53	3.27
	Delete: Lines 45.49 to 45.52 in their entirety	3.28 3.29
	Add:	3.30

Verify that stress reports on all Class 1 valves have been 3.34
stamped "Approved" by the Engineers prior to manufacturing. 3.36
After fabrication has been completed, verify that stress 3.39
reports on all Class 1 valves have been reconciled to the 3.40
as-built conditions, "Approved" by the Engineers, and issued 3.42
a Purchaser's certification. 3.43

Reason: E&DCR No. P01,436 3.45

7	Page: 1-66, after line 54.33	3.48
	Add:	3.49

The Seller shall show the valve weight on the valve assembly 3.54
drawing. All completed valves shall be weighed by the 3.57
Seller before shipment to verify that the weight shown on 4.1
the drawing is correct. If the weight shown on the drawing 4.2
deviates beyond ±10 percent of the actual weight, the Seller 4.4
shall notify the Engineers within 24 hr. The Seller shall 4.8
then revise the valve assembly drawing to show the actual 4.10
weight and the revised center of gravity (if necessary) and 4.12
immediately resubmit the drawing to the Engineers for review 4.14
and approval. Valve shipment will not be held up pending 4.16
such reapproval of the drawings. 4.17

Reason: E&DCR No. P01,428 4.19

Item	Change to Specification		
8	Page:	4-3CCCCC of Revision 2	4.22
	Delete:	- 4-3CCCCC -	4.23
	Add:	Revised Data Sheet 4-3CCCCC	4.24
	Reason:	Socket weld ends are being changed	4.25
		to butt weld ends	4.26
9	Page:	4-3EEEEE of Revision 2	4.29
	Delete:	- 4-3EEEEE -	4.30
	Add:	Revised Data Sheet 4-3EEEEE	4.31
	Reason:	Socket weld ends are being changed	4.32
		to butt weld ends	4.33
10	Page:	4-3UUUUU of Addendum 2 to Revision 2	4.36
	Delete:	- 4-3UUUUU -	4.37
	Add:	Revised Data Sheet 4-3UUUUU	4.38
	Reason:	Socket weld ends are being changed	4.39
		to butt weld ends	4.40
11	Page:	4-3VVVVV of Addendum 2 to Revision 2	4.43
	Delete:	- 4-3VVVVV -	4.44
	Add:	Revised Data Sheet 4-3VVVVV	4.45
	Reason:	Socket weld ends are being changed	4.46
		to butt weld ends	4.47
12	Page:	4-3WWWWW of Addendum 2 to Revision 2	4.50
	Delete:	- 4-3WWWWW -	4.51
	Add:	Revised Data Sheet 4-3WWWWW	4.52
	Reason:	Socket weld ends are being changed	4.53
		to butt weld ends	4.54
13	Page:	Addendum 4 to Revision 2, page 0-2	4.58
	Add:		5.1

E&DCRs	N&Ds	
		5.3
V10,305	FQC 1957	5.5
V10,329	FQC 1958	5.6
V10,357	FQC 2365	5.7
V10,413	FQC 2626	5.8
V10,559	FQC 3171	5.9
V10,572	FQC 4486	5.10
P01,197	PQA G054	5.11
	PQA Z030	5.12

Reason: Editorial change 5.14

Item	Change to Specification	
14	Page:	A4-1, line 1.53
	Delete:	- P01,045, P01,188, P01,197 -
	Add:	- P01,188 -
	Reason:	Editorial change
15	Page:	A4-4, after line 4.57
	Add:	

Class 1 Stress Reports Reconciled to As-Built Conditions - - - 4 - - - 1 - -

	Reason:	E&DCR No. P01,436
16	Page:	A4-4
	Delete:	Lines 5.9 and 5.10
	Add:	

Hydrostatic Seat Test Reports - - - - - - 1 - -

	Reason:	E&DCR No. P01,416
17	Page:	A4-4, after line 5.10
	Add:	

Hydrostatic Seat Tightness Test Reports - - - 2 - - - 1 - -

	Reason:	E&DCR No. P01,416

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3CCCC
SPEC. NO. NMP2-PEQ-R
J.O. NO. 12177
DATE 1-21-83

CLIENT: NMPC
PROJECT: NMP2
PREPARED BY: JS

S&W Identification No.	2DER-MOV128	2DER-MOV129
Valve-Code & Class		
S&W Description No.	VOW150-F-1MQ	VOW150-F-1MQ
Press. Class & Type	1500# GLOBE	1500# GLOBE
Size-in.	2	2
Quantity	1	1
Service	THROTTLE-OPEN-CLOSE	THROTTLE
Fluid	WATER	WATER
Body & Bonnet Mat'l	SA 105	SA 105
Trim Mat'l		
Design Press.-psig	1250	1250
Design Temp.-°F	575	575
Max. Diff. Press.-psid	1050	1050
Temp. Range-°F	40-575	40-575
Max. Continuous Flow	200	200
End Preparation-In.	BW	BW
End Preparation-Out.	BW	BW
NORMAL DIFF PRESS.	1050 PSI	1050 PSI
FSK No.		
Line Designation No.		
Line Mat'l & Sch.-In.	SCH 80	SCH 80
Line Mat'l & Sch.-Out.	SCH 80	SCH 40
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class		
Normal Ambient Temp.-°C	65.5	65.5
Space Heater-Location & Voltage		
Valve Location	OUTSIDE PRI CTMT	OUTSIDE PRI CTMT
Time To Operate-sec.		
Close, Max.		
Open, Max.		
-or-		
Close, +__%, -__%		
Open, +__%, -__%		
Special Requirements		
1) Active Valve		
2) Air Seat Test		
3) Gate Valve Overpress. Protection Method		
4) Relief Valve Setting		
NO. LIMIT SWITCH CONTACTS		
CLOSE	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
OPEN	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
REV. 3		
REV. 2		
REV. 1		

A5038.60A

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3EEEEE
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1-21-83

CLIENT: NMPC
PROJECT: NMP2
PREPARED BY: JS

	S&W Identification No.	2RHS-MOV67A	2RHS-MOV67B
	Valve-Code & Class		
	S&W Description No.	VOW150-F-1WQ	VOW150-F-1WQ
	Press. Class & Type	1500# GLOBE	1500# GLOBE
	Size-in.	2	2
	Quantity	1	1
	Service	THROTTLING	THROTTLING
	Fluid	WATER	WATER
	Body & Bonnet Mat'l	SA 105	SA 105
	Trim Mat'l		
	Design Press.-psig	1550	1550
	Design Temp.-°F	575	575
	Max. Diff. Press.-psid	1230	1230
	Temp. Range-°F	70-540	70-540
	Max. Continuous Flow	150 GPM	150 GPM
	End Preparation-In.	BW	BW
	End Preparation-Out.	BW	BW
	NORMAL OPER. PRESS.	1230 PSI	1230 PSI
	FSK No.		
	Line Designation No.		
	Line Mat'l & Sch.-In.	SCH 160	SCH 160
	Line Mat'l & Sch.-Out.	SCH 160	SCH 160
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	CL H(K)	CL H(R)
	Normal Ambient Temp.-°C	65.5	65.5
	Space Heater-Location & Voltage		
	Valve Location	INSIDE PRI CTMT	INSIDE PRI CTMT.
	Time To Operate-sec.		
	Close, Max.		
	Open, Max.		
	-or-		
	Close, +__%, -__%		
	Open, +__%, -__%		
	Special Requirements		
	1) Active Valve	YES	YES
	2) LOW SEAT LEAKAGE	YES	YES
	3) CONT. ISO. VALVE	YES	YES
	NO. LIMIT SWITCH CONTACTS		
	CLOSE	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	OPEN	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	REV. 3		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3UUUUU
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1-21-83

CLIENT: NMPC
PROJECT: NMP2
PREPARED BY: JS

1	S & W Identification No.	2MSS*MOV208	
2			
3	Valve - Code & Class		
4	S&W Description No.	V0W150-B-1WQ	
5	Press. Class & Type	1500# GLOBE	
6	Size - In.	2	
7	Quantity	1	
8	Service	SHUTOFF	
9	Fluid	STEAM	
10	Body & Bonnet Mat'l	SA 182 F11	
11	Trim Mat'l		
12	Design Press. - psig	1250	
13	Design Temp. - °F	575	
14	Max. Diff. Press. - psid	1250	
15	Temp. Range - °F		
16	Max. Continuous Flow		
17	End Preparation - In.	BW	
18	End Preparation - Out.	BW	
19	NORMAL OPER. PRESS.	964 PSIA	
20	FSK No.		
21	Line Designation No.		
22	Line Mat'l & Sch. - In.	SCH 160	
23	Line Mat'l & Sch. - Out.	SCH 160	
24			
25	Motor Operator		
26	Enclosure	NEMA 4	
27	Power - Volts / Phase / Hz	575/3/60	
28	Insulation Class	CL B	
29	Normal Ambient Temp. - °C	65.5	
30	Space Heater - Location		
31	& Voltage		
32			
33	Valve Location	OUTSIDE PRI. CONTAINMENT	
34			
35	Time To Operate - sec.		
36	Close, Max.		
37	Open, Max.		
38	- or -		
39	Close, + __%, - __%		
40	Open, + __%, - __%		
41			
42	Special Requirements		
43	1) Active Valve		
44	2) Air Seat Test		
45	3) Gate Valve Overpress.		
46	Protection Method		
47	4) Relief Valve Setting		
48			
49	NO. LIMIT SWITCH CONTACTS		
50	CLOSE	4 OPEN 4 CLOSED	
51	OPEN	4 OPEN 4 CLOSED	
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3VVVVV
SPEC. NO. NMP2-P304R
J.O.NO. 12177
DATE 1-21-93

CLIENT: NMPC
PROJECT: NMP2
PREPARED BY: JS

1	S&W Identification No.	2MSS*MOV108	2MSS*MOV118
2			
3	Valve-Code & Class		
4	S&W Description No.	VOW150-F-1WQ	VOW150-F-1WQ
5	Press. Class & Type	1500# GLOBE	1500# GLOBE
6	Size-in.	2	2
7	Quantity	1	1
8	Service	SHUTOFF	SHUTOFF
9	Fluid	STEAM	STEAM
10	Body & Bonnet Mat'l	SA 105	SA 105
11	Trim Mat'l		
12	Design Press.-psig	1250	1250
13	Design Temp.-°F	575	575
14	Max. Diff. Press.-psid	1250	1250
15	Temp. Range-°F		
16	Max. Continuous Flow		
17	End Preparation-In.	BW	BW
18	End Preparation-Out.	BW	BW
19	NORMAL OPER. PRESS.	964 PSIA	964 PSIA
20	FSK No.		
21	Line Designation No.		
22	Line Mat'l & Sch.-In.	SCH 160	SCH 160
23	Line Mat'l & Sch.-Out.	SCH 160	SCH 160
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	CL RH	CL RH
29	Normal Ambient Temp.-°C	65.5	65.5
30	Space Heater-Location		
31	& Voltage		
32			
33	Valve Location	INSIDE PRI. CONTAINMENT	INSIDE PRI. CONTAINMENT
34			
35	Time To Operate-sec.		
36	Close, Max.		
37	Open, Max.		
38	-or-		
39	Close, +__%, -__%		
40	Open, +__%, -__%		
41			
42	Special Requirements		
43	1) Active Valve		
44	2) Air Seat Test		
45	3) Gate Valve Overpress.		
46	Protection Method		
47	4) Relief Valve Setting		
48			
49	NO. LIMIT SWITCH CONTACTS		
50	CLOSE	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
51	OPEN	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3WWWWW
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1-21-83

CLIENT: NMPC
PROJECT: NMP2
PREPARED BY: JS

S&W Identification No.	2MSS*MOV119	2MSS*MOV189
Valve-Code & Class		
S&W Description No.	VOW150-F-1WQ	VOW150-F-1WQ
Press. Class & Type	1500# GLOBE	1500# GLOBE
Size-In.	2	2
Quantity	1	1
Service	SHUTOFF	SHUTOFF
Fluid	STEAM	STEAM
Body & Bonnet Mat'l	SA 105	SA 105
Trim Mat'l		
Design Press.-psig	1250	1250
Design Temp.-°F	575	575
Max. Diff. Press.-psid	1250	1250
Temp. Range-°F		
Max. Continuous Flow		
End Preparation-In.	BW	BW
End Preparation-Out.	BW	BW
NORMAL OPER. PRESS.	964 PSIA	964 PSIA
FSK No.		
Line Designation No.		
Line Mat'l & Sch.-In.	SCH 160	SCH 160
Line Mat'l & Sch.-Out.	SCH 160	SCH 160
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL RH	CL RH
Normal Ambient Temp.-°C	65,5	65,5
Space Heater-Location & Voltage		
Valve Location	INSIDE PRI. CONTAINMENT	INSIDE PRI. CONTAINMENT
Time To Operate-sec.		
Close, Max.		
Open, Max.		
-or-		
Close, +__%, -__%		
Open, +__%, -__%		
Special Requirements		
1) Active Valve		
2) Air Seat Test		
3) Gate Valve Overpress. Protection Method		
4) Relief Valve Setting		
NO. LIMIT SWITCH CONTACTS		
CLOSE	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
OPEN	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
REV. 3		
REV. 2		
REV. 1		

Stone & Webster Engineering Corporation
Cherry Hill Operations Center
Cherry Hill, New Jersey
I
NUCLEAR SAFETY RELATED

J.O. No. 12177 — Addendum 4 to Rev. 2
Spec. No. NMP2-P304R — Page A4-1 of 27

Addendum 4 — November 2, 1982
Specification for

MOTOR-OPERATED CARBON STEEL VALVES
ASME III, CLASSES 1, 2, AND 3

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

Seller: Velan Engineering Companies

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JOSEPH J PANCHISON
ENGINEER
029704-E

APPROVED	Name	Date
Preparer	[illegible]	[illegible]
Lead Engr	[illegible]	10/28/82
Specialist	[illegible]	10/28/82
Proj Engr	[illegible]	11/2/82
Qual Assur	[illegible]	8/17/82
ris Engg	[illegible]	11/2/82
Const Dept	NR	
Independent Review	AJ/TM	10-28-82

This design specification is hereby certified to be complete, correct, and in compliance with the ASME Boiler and Pressure Vessel Code, Section III, NA-3250, dated July 1, 1974, and Addenda dated June 30, 1974, December 31, 1974, June 30, 1975, and December 31, 1975.

Signed: [signature]
Date: 9/23/82
Prof. Eng. State: PA
Registration No.: 029704-E

Independent Reviewer: A. Joyce/TM/QAP
Date: 10/28/82

This Addendum 4 supplements Revision 2 dated March 14, 1980, Addendum 1 dated November 3, 1980, Addendum 2 dated February 9, 1981, and Addendum 3 dated February 18, 1982. This addendum also incorporates "one time only" E&DCRs/N&Ds written against the specification, as well as E&DCR Nos. P01,045, P01,188, P01,197, P01,199. This Addendum also lists E&DCR Nos. P00,806, P00,848, P00,882, P00,923, P00,954, and P11,215, which were incorporated, but not listed, in Addendum 3.

Item	Change to Specification	
1	Page:	After page 0-1
	Add:	New page 0-2 (attached)
	Reason:	Compliance with Engineering Department Memorandum (EDM) 78-19
2	Page:	1-7, after line 7.50
	Add:	

IEEE STD 344 1975 Institute of Electrical and Electronics Engineers, recommended practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations

Reason: Reference on Page 1-27 of Revision 2

3	Page:	1-13, after line 12.11
	Add:	

The use of asbestos products should be minimized, particularly those products in which the asbestos fibers are not encapsulated or impregnated with binder material. Asbestos products in which the asbestos fibers are encapsulated or impregnated with binder material are acceptable provided the Seller furnishes to the Engineers a copy of U.S. Department of Labor Occupational Safety and Health Administration Material Safety Data Sheet (Form OSHA-20) completed by the asbestos product manufacturer. All unbonded asbestos products or containers shall be labeled to indicate that they contain asbestos.

Reason: Incorporates GCN-0025

4	Page:	1-18
	Delete:	Lines 15.58 and 16.1
	Reason:	Incorporates No. E&DCR P01,188
5	Page:	1-27, line 24.14
	Delete:	--1971--
	Reason:	Applicable edition listed under APPLICABLE DOCUMENTS

6	Page:	1-45, line 38.33	2.56
	Add:	- Engineer's Shipping Release	2.57
		The SWEC Engineer's Shipping Release	2.58
		is a written notice from the Engi-	3.1
		neers which signifies that the equip-	3.2
		ment is technically acceptable for	3.3
		shipment. -	3.4
	Reason:	Incorporates E&DCR No. P01,188	3.5
7	Pages:	1-51, after line 43.41	3.9
	Add:	- It shall be the Seller's respon-	3.10
		sibility to obtain a written	3.11
		Engineers' Shipping Release Notice	3.12
		from the Engineers prior to final	3.13
		shop inspection by the Engineers'	3.14
		Shop Inspector. -	3.15
	Reason:	Incorporates E&DCR No. P01,188	3.16
8	Page:	1-56	3.20
	Delete:	Lines 47.56 through 48.2	3.21
	Reason:	Incorporates E&DCR No. P01,188	3.22
9	Page:	1-62	3.26
	Delete:	Lines 53.56 through 54.1	3.27
	Add:		3.28

No shipments shall be made without prior notification to the EQCR. The EQCR will advise the Seller if shipment may be made without inspection and written release. The Seller's completed SWEC Certificate of Compliance must be included in each shipment whether or not inspected by the EQCR. When inspection is required, the EQCR will perform the inspection. The Seller's completed SWEC Certificate of Compliance, when approved and signed by the EQCR, will constitute written release for shipment. These requirements also apply to shipments from the Seller's suppliers when item(s) are to be shipped directly to SWEC or its Clients.

	Reason:	Incorporates E&DCR No. P01,199	3.42
10	Page:	A1-2, A1-3, and A1-4 of Addendum 1	3.45
		to Revision 2	3.46
	Delete:	Lines 2.3 through 4.41	3.47
	Add:	New documentation distribution	3.48
		list as follows:	3.49

DOCUMENTATION

3.54

Documentation by Seller

3.56

The basic documentation required of the Seller shall include all test reports, data sheets, and certificates which are required by any of the applicable codes and state and local authorities. These shall include, but not be limited to, the following:

4.1 4.2 4.3 4.5

Title	Distribution and No. of Copies EPE	ESI	Mail	ME	S	
Welding Procedures	4	-	-	1	-	4.10 4.11 4.13
Welding Procedure Qualifications	4	-	-	1	-	4.15 4.16
Welder Qualifications	-	-	-	1	-	4.19
Heat Treatment Procedures	4	-	-	1	-	4.32 4.33
Heat Treatment Records	-	2	-	1	-	4.36
NDE Procedures	4	-	-	1	-	4.38
NDE Personnel Qualifications	-	-	-	1	-	4.41 4.42
Certified Material Test Reports for Pressure-Retaining Parts (Including Impact Tests & Weld Filler Metal)	-	2	-	1	-	4.46 4.47 4.48 4.49 4.50
Certified NDE Reports	-	2	-	1	-	4.53
Certified Stress Report (Class 1 only)	4	-	-	1	-	4.56 4.57
Radiographic Film	-	-	1	1	-	5.1
Hydrostatic Shell Test Reports	-	2	-	1	-	5.4 5.5
Hydrostatic Seat Test Reports	-	2	-	1	-	5.9 5.10

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Dielectric Test Reports	4	2	-	1	-	5.13
Locked Rotor Test Reports	4	2	-	1	-	5.16 5.17
Performance Test Report (including operating volts and amps)	4	2	-	1	-	5.21 5.22 5.23
Seismic Certificate of Compliance	2	-	-	1	-	5.27 5.28
Motor Operator Prototype Test Data Report	4	-	-	1	-	5.32 5.33
Motor Operator Test Procedure	4	-	-	1	-	5.37 5.38
Pneumatic Seat Leakage Test Procedure	4	-	-	1	-	5.42 5.43
Pneumatic Seat Leakage Test Reports	4	2	-	1	-	5.47 5.48
Thrust/Torque Test Reports	4	2	-	1	-	5.52 5.53
Stalled Thrust/Torque Test Reports	4	2	-	1	-	5.57 5.58
Motor Operator Sizing Calculation	4	-	-	1	-	6.4 6.5
Seismic Calculations	4	-	-	1	-	6.8
Seismic Testing Test Report	4	-	-	1	-	6.11 6.12
Operability Testing Test Report	4	-	-	1	-	6.16 6.17
Dimensional Check Certification	-	2	-	1	-	6.21 6.22
Wall Thickness Measurement Procedure	4	-	-	1	-	6.26 6.27

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Wall Thickness Measurement Documentation	-	2	-	1	-	6.31 6.32
Shop Cleaning Procedures	4	-	-	1	-	6.36 6.37
Packaging and Shipping Procedures	4	-	-	1	-	6.41 6.42
Records for Preparation for Shipment (in accordance with Section 8 of ANSI N45.2.2)	-	-	-	1	-	6.46 6.47 6.48 6.49 6.50
Storage Requirements	4	-	-	1	1	6.53
Documentation Checklist	4	2	-	1	1	6.55
Manufacturer's Data Reports	-	2	-	1	1	6.58 7.1
Engineer's Shipping Release Notice	-	2	-	1	-	7.5 7.6
Form OSHA-20 for Asbestos	-	2	-	1	-	7.9

Reason: SWEC-revised requirement and incorporates E&DCR Nos. P01,188 and P01,045 — 7.12 7.13 7.14

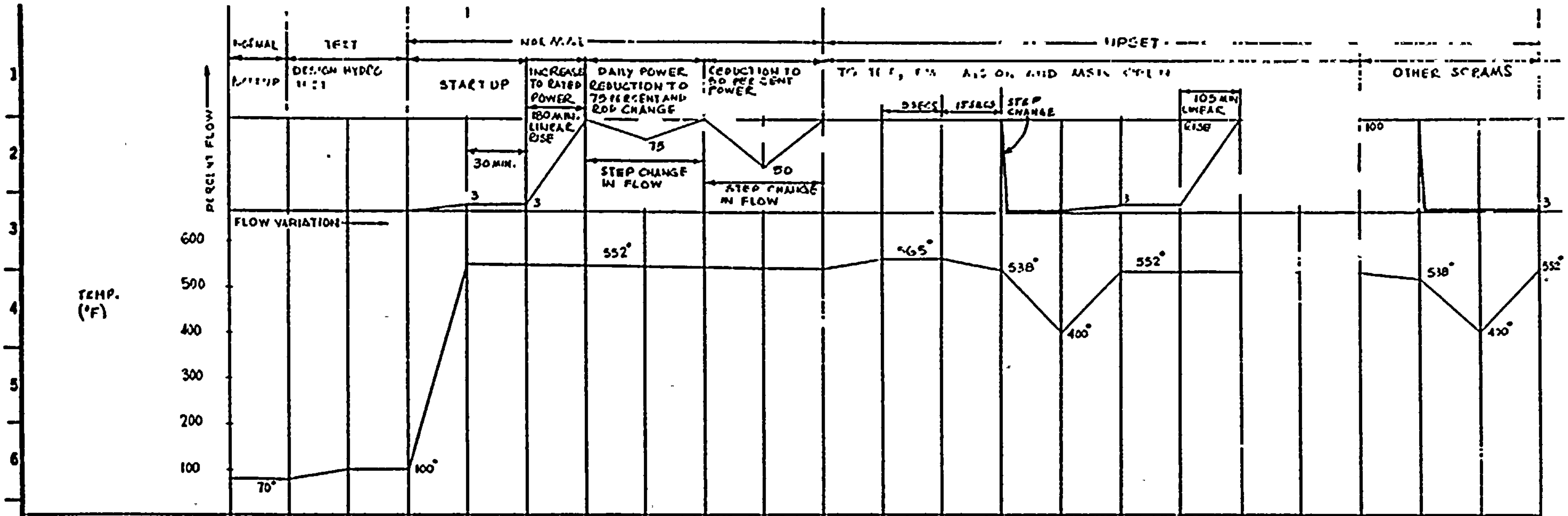
11

Pages: A3-4 through A3-7 of Addendum 3 to Revision 2 — 7.23 7.24
Delete: Pages A3-4 through A3-7 — 7.25
Add: Attached pages A4-9 through A4-12 — 7.26
Reason: Add addendum and page identification — 7.27

12	Page:	VALVE DATA SHEETS	7.31
	Delete:	Valve Data Sheets, pages 4-3I, 4-3Y,	7.32
		4-3AA, 4-3KKKKK, 4-3QQQQQ,	7.33
		4-3SSSSS, 4-3YYYYY, 4-3AAAAAA,	7.34
		4-3BBBBBB, and 4-3CCCCCC	7.35
	Add:	Revised Data Sheets, pages 4-3I, 4-3Y,	7.36
		4-3AA, 4-3KKKKK, 4-3QQQQQ, 4-3SSSSS,	7.37
		4-3YYYYY, 4-3AAAAAA, 4-3BBBBBB,	7.38
		and 4-3CCCCCC, all dated	7.39
		May 3, 1982	7.40
	Reason:	Remove hold, add active valve	7.41
		requirements, and add operating time	7.42
		requirements	7.43
13	Page:	VALVE DATA SHEETS	7.47
	Add:	New Valve Data Sheets, pages	7.48
		4-3DDDDDD, 4-3EEEEEE, and 4-3FFFFFF	7.49
		dated May 3, 1982, and 4-3GGGGGG and	7.50
		4-3HHHHHH dated June 2, 1982	7.51
	Reason:	New SWEC requirement	7.52

The E&DCRs/N&Ds listed below are "one time only" changes and therefore are not and will not be incorporated into the body of the specification.

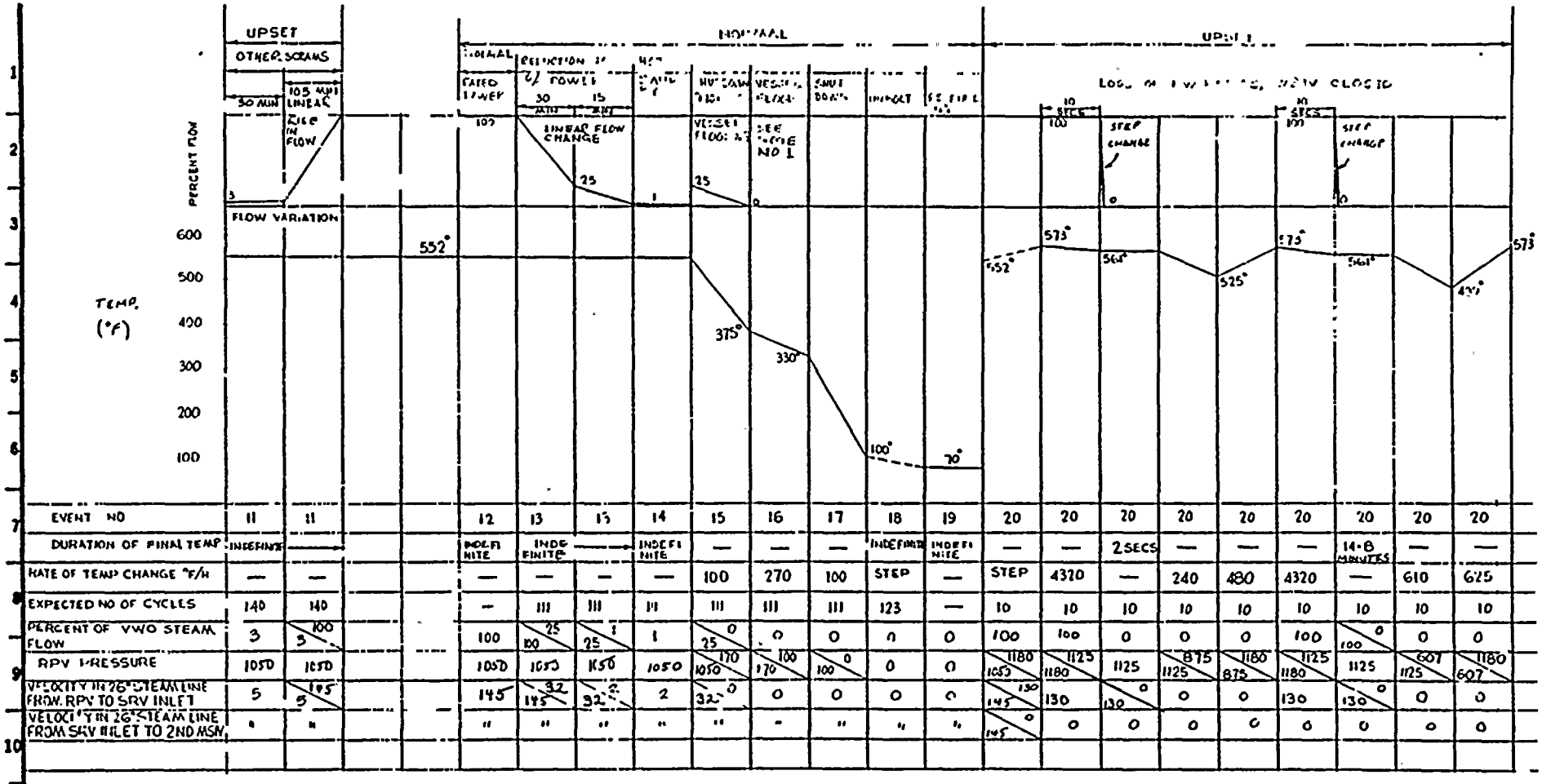
N&Ds	E&DCRs
FQC 1938	P00,702
FQC 1939	P00,652
FQC 2002	



EVENT NO	1	2	2	3	3	4	5&7	5&7	6	6	8&10	8&10	8&10	8&10	8&10	8&10	8&10			11	11	11
DURATION OF FINAL TEMP	INDEFINITE	—	INDEFINITE	—	INDEFINITE	INDEFINITE	—	INDEFINITE		INDEFINITE	—	5 SECS	—	—	—	INDEFINITE →				—	—	—
RATE OF TEMP CHANGE °F/H	—	60	—	100	—	—	—	—	—	—	4680	—	6500	100	100	—	—			3360	100	100
EXPECTED NO OF CYCLES	123	130	130	120	120	120	10,400	10,400	2000	2000	50	50	50	50	50	50	50			140	140	140
PERCENT OF VWO STEAM FLOW	0	0	0	0 / 3	3	3 / 100	100 / 75	75 / 100	100 / 50	50 / 100	100	100	100	100 / 3	0 / 3	3	3 / 100			100 / 0	0	0 / 3
RPV PRESSURE (PSIG)	0	0 / 1250	1250 / 0	0 / 1050	1050	1050	1050	1050	1050	1050	1050 / 1125	1125	1125 / 930	930 / 240	240 / 1050	1050	1050			1050 / 930	930 / 240	240 / 1050
VELOCITY IN 26" LINE FROM RPV TO SRV INLET (FT/S)	0	0	0	0 / 5	5	5 / 145	145 / 109	109 / 145	145 / 73	73 / 145	145 / 138	138	138 / 165	165 / 20	20 / 5	5	5 / 145			145	145 / 20	20 / 5
VELOCITY IN 26" LINE FROM SRV INLET TO 2ND MSIV (FT/S)	0	0	0	"	"	"	"	"	"	"	"	145 / 32	32 / 38	38 / 20	"	"	"			"	"	"

GENERAL: THIS HISTOGRAM IS DEVELOPED BASED ON THE FOLLOWINGS:
1. FOR PRESSURE AND TEMP TRANSIENTS - NUCLEAR BOILER SYSTEM DESIGN SPECIFICATION, GE DOCUMENT NO 22A2887 REV. 6 AND REACTOR VESSEL THERMAL CYCLES, GE DOCUMENT NO 1C2.F.6/3 REV. 2
2. FOR FLOW ... REACTOR VESSEL NOZZLE THERMAL CYCLE ... 2-1-76 AND S&W ... NO A10-2Ø-2 AND A10-2Ø-3
3. VELOCITY OF MAIN STEAM FROM RPV TO SRV INLET AND FROM SRV INLET TO 2ND MSIV IS SAME UNLESS OTHERWISE SHOWN.

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
1-11-80
12177-SK-A104
SHEET 1 OF 4



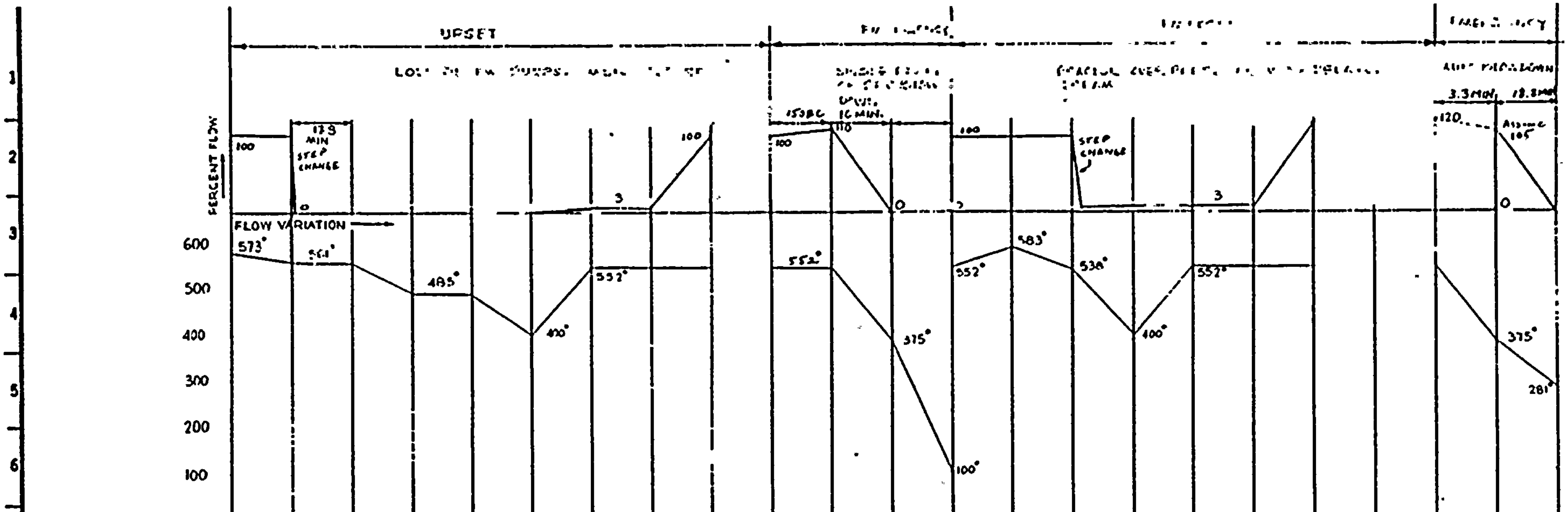
EVENT NO	11	11			12	13	13	14	15	16	17	18	19	20	20	20	20	20	20	20	20	20
DURATION OF FINAL TEMP	INDEFINITE	→			INDEFINITE	INDEFINITE	→	INDEFINITE	—	—	—	INDEFINITE	INDEFINITE	—	—	2 SECS	—	—	—	14.8 MINUTES	—	—
RATE OF TEMP CHANGE °F/H	—	—			—	—	—	—	100	270	100	STEP	—	STEP	4320	—	240	480	4320	—	610	625
EXPECTED NO OF CYCLES	140	140			—	111	111	111	111	111	111	123	—	10	10	10	10	10	10	10	10	10
PERCENT OF VWO STEAM FLOW	3	100 / 3			100	25 / 100	25 / 1	1	0 / 25	0	0	0	0	100	100	0	0	0	100	0 / 100	0	0
RPV PRESSURE	1050	1050			1050	1053	1150	1050	1170 / 1050	1170 / 100	100 / 0	0	0	1180 / 1053	1125 / 1180	1125	875 / 1125	1180 / 875	1125 / 1180	1125	607 / 1125	1180 / 607
VELOCITY IN 26" STEAM LINE FROM RPV TO SRV INLET	5	195 / 5			145	32 / 145	32 / 2	2	32 / 0	0	0	0	0	130 / 145	130	0 / 130	0	0	130	0 / 130	0	0
VELOCITY IN 26" STEAM LINE FROM SRV INLET TO 2ND MSIV	"	"			"	"	"	"	"	"	"	"	"	0 / 145	0	0	0	0	0	0	0	0

NOTE: 1 DURING THIS PERIOD, WATER FLOWS INTO THE MAIN STEAM PIPE VELOCITY ASSUMED ZERO

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.

STONE & WEBSTER ENGINEERING CORPORATION
12177-SK-A104
SHEET 2 OF 4

1-11-80



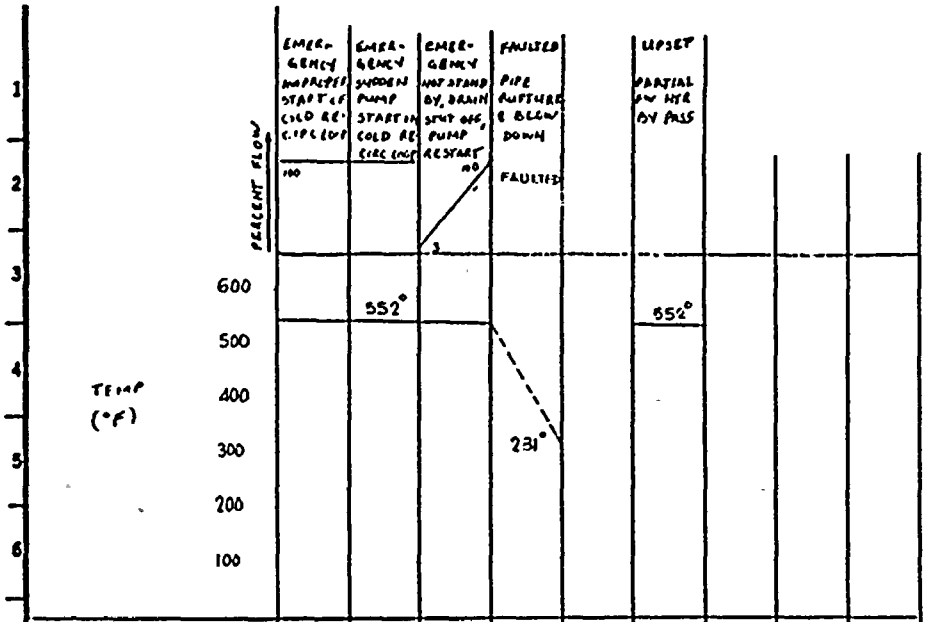
EVENT NO	20	20	20	20	20	20	20	20		21	21	21	22	22	22	22	22	22		23	23
DURATION OF FINAL TEMP	—	17.8 MINUTES	—	INDEFINITE	—	—	INDEFINITE →	→		—	—	—	—	—	—	INDEFINITE →	→	→		—	—
RATE OF TEMP CHANGE °F/H	4320	—	650	—	100	100	—	—		0	1062	100	55800	5400	100	100	—	—		32:8	300
EXPECTED NO OF CYCLES	10	10	10	10	10	10	10	10		8	8	8	1	1	1	1	1	1		1	1
PERCENT OF REACTOR RATED FLOW	100	100 / 0	0	0	0	0 / 3	3	3 / 100		100 / 110	110 / 0	0	100	100 / 0	0	0 / 3	3	3 / 100		120 / 0	0
RPV PRESSURE	1180 / 1125	1125	1125 / 579	579	579 / 233	233 / 1050	1050	1050		1050	1050 / 170	170 / 0	1050 / 1350	1350 / 930	930 / 240	240 / 1050	1050	1050		1653 / 110	170 / 35
VELOCITY IN STEAM LINE FROM RPV TO REL VLV INLET - 26" ϕ	130	130 / 0	0	0	0	0 / 5	5	5 / 145		145 / 159	159 / 0	0	145 / 108	108 / 165	165 / 20	20 / 5	5	5 / 145		174 / 903	903 / 0
VELOCITY IN STEAM LINE FROM REL VLV INLET TO 2ND MSIV	0	0	0	0	0	0 / 5	5	5 / 145		145 / 150	150 / 0	0	145 / 108	108 / 5	5 / 20	20 / 5	5	5 / 145		113 / 560	560 / 0

MAIN STEAM THERMAL TRANSIENT

STONE & WEBSTER ENGINEERING CORPORATION

1-11-80

12177-SK-A104
SHEET 3 OF 4



	EVENT NO	DURATION OF FINAL TEMP	RATE OF TEMP CHANGE °F/H	EXPECTED NO CYCLES	PERCENT OF REACTOR RATED FLOW	RPV PRESSURE	VELOCITY IN 26" LINE FROM RPV TO SRV INLET	VELOCITY IN 26" LINE FROM SRV INLET TO 2ND MSIV
EMERGENCY IMPROPERLY START OF COLD RECIRC LOOP	24	INDEFINITE	—	1	100	1050	145	
EMERGENCY SHUTDOWN PUMP START IN COLD RECIRC LOOP	25	INDEFINITE	—	1	100	1050	145	
EMERGENCY HOT STAND BY, DRAIN SYST OFF, PUMP RESTART	26	INDEFINITE	—	1		1050	145 / 5	
FAULTED PIPE RUPTURE & BLOW DOWN FAULTED	27		STEP	1	100 / 0	1050 / 35	145 / 0	
UPSET PARTIAL SW HTR BY PASS	9	INDEFINITE	—	70	100	1050	145	

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.

1-11-80

STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A104
SHEET 4 OF 4

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev. 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 5/13/87

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: HA del S

	2 MSS - MOV 111	2 MSS - MOV 112
S & W Mark No.	66 B22-F016	B22-F019
Valve		
Quantity	One	One
Size	6" Inch	6" Inch
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Steam/Condensate	Steam/Condensate
S & W Description No.	VGW060 - B - 1MQ	VGW060 - B - 1MQ
Rating	600#	600#
Material	SA105	CRMO F22 | 4
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	980	980
Max. Diff. Press.-psi	1220	1220
Temperature Range - °F	65 - 573	65 - 573
Maximum Flow	385 gpm	385 gpm
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule	Sch. 80	Sch. 80
" " Bore Inlet:	ØCW = 5.878"	ØCW = 5.878"
Outlet:	ØCW = 5.878"	ØCW = 5.761"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Inside Isol.	3) Outside Iso.
		4) End Pren. for Class 4 on Outlet
		5) Welded SA105 Transtion Piece | 4 ΔAL = 2'-8" (Inlet)

REV. 3
REV. 2
REV. 1

A5028.60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE 5/13/87

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: HAdels

S & W Mark No.	2 SWP - MOV 38A	2 SWP - MOV 38B
Valve		
Quantity	One	One
Size	6 Inch	6 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW015 - P - 3KQ	VGW015 - P - 3KQ
Rating	150#	150#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	70	70
Max. Diff. Press.-psi	108	108
Temperature Range - °F	32 - 77	32 - 77
Maximum Flow	375 gpm	375 gpm
Design Pressure - psig.	150	150
Design Temperature - F	130	130
Pipe Schedule	Std.	Std.
"C" Bore	6.094	6.094
Trim	STELLITE	STELLITE
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Std. Cl. B	Std. Cl. B
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	Active Valve 14	Active Valve 14
REV. 3		
REV. 2		
REV. 1		

A5036.50

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3A1
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 5/3/82

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: MMdels

	S & W Mark No.	2 SWP - MOV 39A	2 SWP - MOV 39B
	Valve		
	Quantity	One	One
	Size	6 Inch	6 Inch
	Type	Gate	Gate
	Service	Shutoff	Shutoff
	Fluid	Water	Water
	S & W Description No.	VGW015 - P - 3KQ	VGW015 - P - 3KQ
	Rating	150#	150#
	Material	SA105	SA105
	End Preparation	Butt Weld	Butt Weld
	Normal Oper. Press.-psi	70	70
	Max. Diff. Press.-psi	108	108
	Temperature Range - °F	32 - 90	32 - 90
	Maximum Flow	375 gpm	375 gpm
	Design Pressure - psig.	150	150
	Design Temperature - F	130	130
	Pipe Schedule	Std.	Std.
	"C" Bore	6.094"	6.094"
	Trim	STELLITE	STELLITE
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	Std. Cl. B	Std. Cl. B
	Normal Ambient Temp.-C	65.5	65.5
	Location	Outside Pri. Containment	Outside Pri. Containment
	No. Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	Active Valve 14	Active Valve 14

REV. 3	
REV. 2	
REV. 1	

▲2038.60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3KKKKK
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE 5/31/82

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: HAdels

S & W Mark No.	2 CCP-MOV 93A	2 CCP-MOV 93B
Valve		
Quantity	ONE	ONE
Size	6 INCH	6 INCH
Type	GATE	GATE
Service	SHUTOFF	SHUTOFF
Fluid	WATER	WATER
S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	BUTTWELD	BUTTWELD
Normal Oper. Press. - psi	100	100
Max. Diff. Press. - psi	150	150
Temperature Range - F	40-160	40-160
Maximum Flow	600	600
Design Pressure - psig	200	200
Design Temperature - F	250	250
Pipe Schedule	STD	STD
Pipe Bore "C"	6.094	6.094
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	STD CL B	STD CL B
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI CTMT	OUTSIDE PRI CTMT.
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements	Active Valve 4	Active Valve 4
Rev 3		
Rev 2		
Rev 1		

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3QQQQ
SPEC. NO. NMP2-P 304R
J.O. NO: 12177
DATE 5/3/82

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: MAdels

	S & W Mark No.	2 SWP-MOV 94A	2 SWP-MOV 94B
	Valve		
	Quantity	ONE	ONE
	Size	8 INCH	8 INCH
	Type	GATE	GATE
	Service	SHUTOFF	SHUTOFF
	Fluid	WATER	WATER
	S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
	Rating	150#	150#
	Material	SA105	SA105
	End Preparation	BUTTWELD	BUTTWELD
	Normal Oper. Press. - psi	91	91
	Max. Diff. Press. - psi	108	108
	Temperature Range - F	32-77	32-77
	Maximum Flow	800	800
	Design Pressure - psig	150	150
	Design Temperature - F	130	130
	Pipe Schedule	STD	STD
	Pipe Bore "C"	8.020	8.020
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	STD Cl B	STD Cl B
	Normal Ambient Temp.-C	65.5	65.5
	Location	OUTSIDE PRI. CTMT.	OUTSIDE PRI CTMT.
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements	Active Valve 4	Active Valve 4
	Rev 3		
	Rev 2		
	Rev 1		

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3SSSSS
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 5/31/82

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: HAdels

	S & W Mark No.	2SWP-MOV 95A	2SWP-MOV 95B
	Valve		
	Quantity	ONE	ONE
	Size	8 INCH	8 INCH
	Type	GATE	GATE
	Service	SHUTOFF	SHUTOFF
	Fluid	WATER	WATER
	S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
	Rating	150#	150#
	Material	SA 105	SA 105
	End Preparation	BUTTWELD	BUTTWELD
	Normal Oper. Press. - psi	91	91
	Max. Diff. Press. - psi	108	108
	Temperature Range - F	32-77	32-77
	Maximum Flow	800 GPM	800 GPM
	Design Pressure - psig	150	150
	Design Temperature - F	130	130
	Pipe Schedule	STD.	STD
	Pipe Bore "C"	8.020	8.020
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	STD CL B	STD CL B
	Normal Ambient Temp.-C	65.5	65.5
	Location	OUTSIDE PRI. CTMT.	OUTSIDE PRI. CTMT.
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements	Active Valve 14	Active Valve 14

Rev 3
Rev 2
Rev 1

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3YYYYY
SPEC. NO. NMP2-P304R
J.O. NO. 12177

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: HAdels DATE 5/13/82

	2 SWP * MOV 67A	2 SWP * MOV 67B
S & W Mark No.		
Valve		
Quantity	1	1
Size	4"	4"
Type	GATE	GATE
Service	SHUTOFF	SHUTOFF
Fluid	WATER	WATER
S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
Rating	150#	150#
Material	SA105	SA105
End Preparation	BW	BW
Normal Oper. Press. - psia	123	123
Max. Diff. Press. - psi	108	108
Temperature Range - F	32/77	32/77
Maximum Flow	400 GPM	400 GPM
Design Pressure - psig	150	150
Design Temperature - F	130	130
Pipe Schedule	STD WT.	STD WT.
Pipe Bore "B"	4.026"	4.026"
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL B	CL B
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRIMARY CONTAINMENT	OUTSIDE PRI. CONTAINMENT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements	Active Valves 14	Active Valves 14

Rev 3

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev. 2

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

SPEC. NO. NMP2-P304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels DATE 5/3/82

S & W Mark No.	2ASS-MOV152	2ICS-MOV170
Valve		
Quantity	One	One
Size	4"	1"
Type	Gate	Globe
Service	Shutoff	Steam line warm-up
Fluid	Saturated Steam	Steam
S & W Description No.	VGW090-F-4MVQ	VOS150-F-2Q
Rating & Material	900# / SA105	1500# / SA105
End Preparation	Butt Weld	Socket Weld
Normal Operating Pressure - psi	950 psig	1000 psig
Max. Diff. Press. - psi	300	1158 psig
Temp. Range - F	40 - 540	40° - 575°
Max. Flow - gpm	13,400 #/hr	Sonic Velocity
Design Temperature	575°F	575°F
Design Pressure	1250 psig	1250 psig
Pipe Schedule	120	N/A
"C" Bore	3.642"	N/A
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power - Volts / Phase / Hz	575/3/60	575/3/60
Insulation Class	Std. Cl. B	Cl. RH
Normal Ambient Temp. - C	65.5	65.5
Location	Outside Prim. Containment	Inside Prim. Containment
No. of Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Testing	Compliance to "Operability" Testing Section	
Special Requirements		1) Active Valve; 2) 5 Second Max. Operating time [4]
REV. 3		
REV. 2		
REV. 1		

▲5038 60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

PAGE 4-3BBRBBB R
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 5/3/82

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels

	S & W Mark No.	2CCP-MOV94A	2CCP-MOV94B
	Valve		
	Quantity	One	One
	Size	4"	4"
	Type	Gate	Gate
	Service	Open/Close	Open/Close
	Fluid	Demin. Water	Demin. Water
	S & W Description No.	VGW015-H-2KQ	VGW015-H-2KQ
	Rating & Material	150# / SA105	150# / SA105
	End Preparation	Buttweld	Buttweld
	Normal Operating Pressure - psi	150	150
	Max. Diff. Press. - psi	150	150
	Temp. Range - F	70 - 150°F	70 - 150°F
	Max. Flow - gpm	400	400
	Design Temperature	150°F	150°F
	Design Pressure	225 psi	225 psi
	Pipe Schedule	40	40
	"B" Bore	2.469"	2.469"
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power - Volts / Phase / Hz	575/3/60	575/3/60
	Insulation Class	RH	RH
	Normal Ambient Temp. - C	65.5	65.5
	Location	Inside Prim. Cont.	Inside Prim. Cont.
	No. of Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	Cv ≥ 760	Cv ≥ 760
		Low Leakage	Low Leakage
		End-to-End = 1'-2"	End-to-End = 1'-2"

REV. 3
REV. 2
REV. 1

▲5038 60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET Addendum 4 to Rev 2

BY: ENGINEERS

PAGE 4-3CCCCCC
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 513182

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels

1	S & W Mark No.	2CCP-MOV273		2MSS-MOV207
2				
3	Valve			
4	Quantity	One		One
5	Size	8"		6"
6	Type	Gate		Globe
7	Service	Open/Close	4	Open/Close
8	Fluid	Water		Steam/Water
9	S & W Description No.	VGW015-P-2KQ		VOW060-B-1MQ
10	Rating & Material	150# / SA105		600# / SA105
11	End Preparation	Buttweld		Buttweld
12	Normal Operating Pressure - psi	110		964 psia
13	Max. Diff. Press. - psi	150		1130 psi
14	Temp. Range - F	65°-95°		65°-559°
15	Max. Flow - gpm	1300		255
16	Design Temperature	150°		575°F
17	Design Pressure	225 psig		1250 psig
18	Pipe Schedule	Std.		80
19				
20	"C" Bore	8.020		5.828"
21	Trim	Stellite	4	Stellite
22				
23				
24				
25	Motor Operator			
26	Enclosure	NEMA 4		NEMA 4
27	Power-Volts/Phase/Hz	575/3/60		575/3/60
28	Insulation Class	Cl. RH		Cl. RH
29	Normal Ambient Temp.-C	65.5°		65.5°
30				
31				
32	Location	Inside Primary Containment		Inside Primary Contain.
33				
34				
35				
36				
37				
38	No. of Limit Switch Contacts			
39	Close	4 Open 4 Closed		4 Open 4 Closed
40	Open	4 Open 4 Closed		4 Open 4 Closed
41				
42				
43				
44				
45				
46	Special Requirements	Low Seat Leakage	4	
47		Active Valve		
48				
49				
50				
51				
52				
53				
	REV. 3			
	REV. 2			
	REV. 1			

▲5038 60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3DDDDDD
SPEC. NO. NMP2-P304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels DATE 3/3/82

	S & W Mark No.	2CCP-MOV15A	2CCP-MOV15B
	Valve		
	Quantity	One	One
	Size	4"	4"
	Type	Gate	Gate
	Service	Open/Close	Open/Close
	Fluid	Demin. Water	Demin. Water
	S & W Description No.	VGW01S-H-2KQ	VGW01S-H-2KQ
	Rating & Material	150# / SA105	150# / SA105
	End Preparation	Buttweld	Buttweld
	Normal Operating Pressure - psi	100	100
	Max. Diff. Press. - psi	150	150
	Temp. Range - F	70 - 150°F	70 - 150°F
	Max. Flow - gpm	400	400
	Design Temperature	150°F	150°F
	Design Pressure	225 psi	225 psi
	Pipe Schedule	40	40
	"B" Bore	2.469"	2.469"
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power - Volts / Phase / Hz	575/3/60	575/3/60
	Insulation Class	RH	RH
	Normal Ambient Temp. - C	65.5	65.5
	Location	Inside Prim. Cont.	Inside Prim. Cont.
	No. of Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	Cv ≥ 760	Cv ≥ 760
		Low Leakage	Low Leakage
		End-to-End =	End-to-End =
		1'-2"	1'-2"
	REV. 3		
	REV. 2		
	REV. 1		

▲5038.60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET

BY ENGINEERS

PAGE 4-3EEEEEE
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 5/3/82

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels

	S & W Mark No.	2CCP-MOV16A	2CCP-MOV16B
	Valve		
	Quantity	One	One
	Size	4"	4"
	Type	Gate	Gate
	Service	Open/Close	Open/Close
	Fluid	Demin. Water	Demin. Water
	S & W Description No.	VGW01S-H-2KQ	VGW01S-H-2KQ
	Rating & Material	150# / SA105	150# / SA105
	End Preparation	Buttweld	Buttweld
	Normal Operating Pressure - psi	150	150
	Max. Diff. Press. - psi	150	150
	Temp. Range - F	70 - 150°F	70 - 150°F
	Max. Flow - gpm	400	400
	Design Temperature	150°F	150°F
	Design Pressure	225 psi	225 psi
	Pipe Schedule	40	40
	"B" Bore	2.469"	2.469"
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power - Volts / Phase / Hz	575/3/60	575/3/60
	Insulation Class	RH	RH
	Normal Ambient Temp. - C	65.5	65.5
	Location	Outside Prim. Cont.	Outside Prim. Cont.
	No. of Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	Cv ≥ 760	Cv ≥ 760
		Low Leakage	Low Leakage
		End-to-End = 1'-2"	End-to-End = 1'-2"
	REV. 3		
	REV. 2		
	REV. 1		

▲5038.60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 4 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3FFFFFF
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 5/3/82

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels

	S & W Mark No.	2CCP-MOV17A	2CCP-MOV17B
	Valve		
	Quantity	One	One
	Size	4"	4"
	Type	Gate	Gate
	Service	Open/Close	Open/Close
	Fluid	Demin. Water	Demin. Water
	S & W Description No.	VGW01S-H-2KQ	VGW01S-H-2KQ
	Rating & Material	150# / SA105	150# / SA105
	End Preparation	Buttweld	Buttweld
	Normal Operating Pressure - psi	100	100
	Max. Diff. Press. - psi	150	150
	Temp. Range - F	70 - 150°F	70 - 150°F
	Max. Flow - gpm	400	400
	Design Temperature	150°F	150°F
	Design Pressure	225 psi	225 psi
	Pipe Schedule	40	40
	"B" Bore	2.469"	2.469"
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power - Volts / Phase / Hz	S7513160	S7513160
	Insulation Class	RH	RH
	Normal Ambient Temp. - C	65.5	65.5
	Location	Outside Prim. Cont.	Outside Prim. Cont.
	No. of Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	Cv ≥ 760	Cv ≥ 760
		Low Leakage	Low Leakage
		End-to-End = 1'-2"	End-to-End = 1'-2"

REV. 3
REV. 2
REV. 1

▲5038 60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET Addendum 4 to Rev. 2
BY ENGINEERS

PAGE 4-3GGGGGG
SPEC. NO. NMP2-P304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels DATE 6/2/82

1	S & W Mark No.	2CCP*MOV (Later)	2CCP*MOV (Later)
2			
3	Valve		
4	Quantity	1	1
5	Size	2"	2"
6	Type	Globe	Globe
7	Service	Shutoff	Shutoff
8	Fluid	Water	Water
9	S & W Description No.	VOS060-C-3Q	VOS060-C-3Q
10	Rating & Material	600# SA-105	600# SA-105
11	End Preparation	SW	SW
12	Normal Operating Pressure - psi	100	100
13	Max. Diff. Press. - psi	100	100
14	Temp. Range - F	70-150	70-150
15	Max. Flow - gpm	50	50
16	Design Temperature	150°F	150°F
17	Design Pressure	225 PSIG	225 PSIG
18	Pipe Schedule	80	80
19			
20	"B" Bore	N/A	N/A
21	Trim	N/A	N/A
22			
23			
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	Cl.B	Cl.B
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	Outside Primary Cont.	Outside Primary Containment
33			
34			
35			
36			
37			
38	No. of Limit Switch Contacts		
39	Close	4 Open 4 Closed	4 Open 4 Closed
40	Open	4 Open 4 Closed	4 Open 4 Closed
41			
42			
43			
44			
45			
46	Special Requirements	Cv≥ 160	Cv≥ 160
47		Active Valve	Active Valve
48			
49			
50			
51			
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

▲5038.60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET Addendum 4 to Rev. 2

BY ENGINEERS

SPEC. NO. NMP2-P304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels DATE 6/2/82

1	S & W Mark No.	2CCP*MOV (Later)	2CCP*MOV (Later)
2			
3	Valve		
4	Quantity	1	1
5	Size	1½	1½
6	Type	Globe	Globe
7	Service	Shutoff	Shutoff
8	Fluid	Water	Water
9	S & W Description No.	VOS060-C-3Q	VOS060-C-3Q
10	Rating & Material	600# SA-105	600# SA-105
11	End Preparation	SW	SW
12	Normal Operating Pressure - psi	100	100
13	Max. Diff. Press. - psi	100	100
14	Temp. Range - F	70-150	70-150
15	Max. Flow - gpm	30	30
16	Design Temperature	150°F	150°F
17	Design Pressure	225 PSIG	225 PSIG
18	Pipe Schedule	80	80
19			
20	"B" Bore	N/A	N/A
21	Trim	N/A	N/A
22			
23			
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	Cl.B	Cl.B
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	Outside Primary Cont.	Outside Primary Containment
33			
34			
35			
36			
37			
38	No. of Limit Switch Contacts		
39	Close	4 Open 4 Closed	4 Open 4 Closed
40	Open	4 Open 4 Closed	4 Open 4 Closed
41			
42			
43			
44			
45			
46	Special Requirements	Cv≥ 100	Cv≥ 100
47		Active Valve	Active Valve
48			
49			
50			
51			
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

NOTED FEB 23 1982 J. MARTIN

I

NUCLEAR SAFETY RELATED

J.O. No. 12177
Spec. No. NMP2-P304R

Addendum 3 to Rev. 2
Page A3-1 of 11

February 18, 1982

Addendum 3
Specification for

MOTOR-OPERATED CARBON STEEL VALVES ASME III, CLASSES 1, 2, AND 3

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

Seller:

Velan Engineering Companies

APPROVED	Name	Date
Preparer	[illegible]	2/16/82
Lead Engr	[illegible]	2/16/82
Specialist	A. Joyce/RSD/QAP	1/8/82
Proj Engr	[illegible]	1/15/82
Qual Assur	J.O. Martin	1-14-82
Mtrls Engg	D. Bos/[illegible]	1/11/82
Const Dept	NA	—

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JOSEPH J PANCHISON
ENGINEER
029704-E

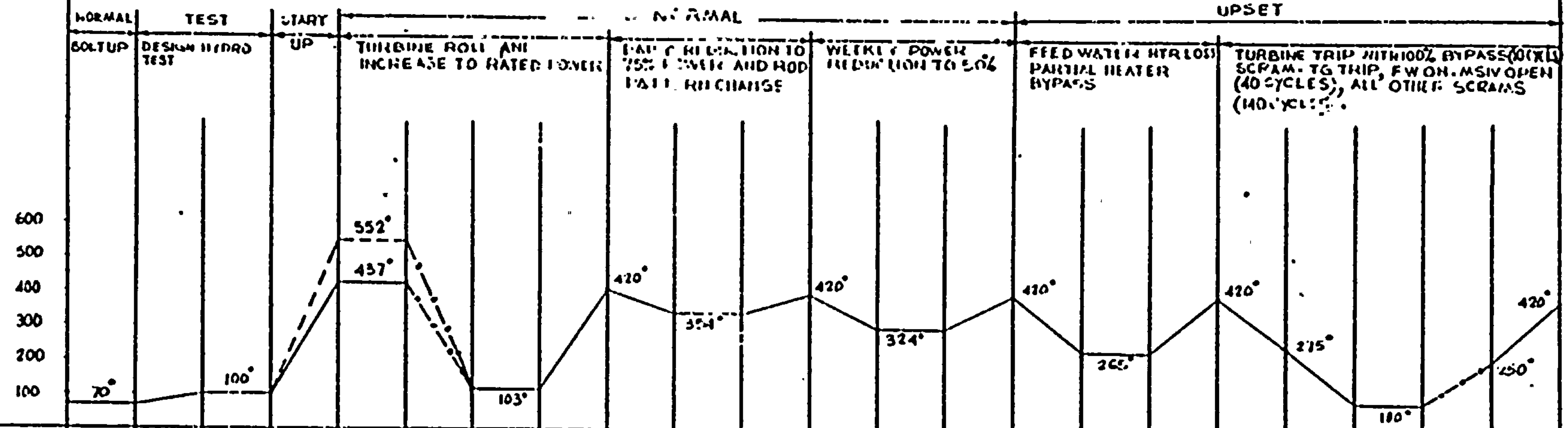
This design specification is hereby certified to be complete, correct, and in compliance with the ASME Boiler and Pressure Vessel Code, Section III, NA-3250, dated July 1, 1974, and Addenda dated June 30, 1974, December 31, 1974, June 30, 1975, and December 31, 1975.

Signed: J. J. Panchison
Date: 1-8-82
Prof. Eng. State: PA
Registration No.: 029704-E

Independent Reviewer: A Joyce/RSD/QAP
Date: 1-8-82

Item	Change to Specification	
1	Page:	A1-3 of 5, Addendum 1 to Rev. 2, line 3.56
	Delete:	- 2 -
	Reason:	S&W revised requirement
2	Page:	1-9, line 9.52
	Delete:	- is -
	Add:	- and No. 2ASS-M0V148 are -
	Reason:	To incorporate E&DCR P00,882
3	Page:	1-11, line 11.1
	Delete:	- prior to manufacturing -
	Reason:	To incorporate E&DCR P00,882
4	Page:	1-15, line 13.58 after "welded to"
	Add:	- or integrally cast with -
	Reason:	To incorporate E&DCR P00,882
5	Page:	1-15, line 14.1.
	Delete:	-, where applicable, -
	Reason:	To incorporate E&DCR P00,882
6	Page:	1-19, line 17.22
	Delete:	- stress relieving and radiographing -
	Reason:	To incorporate E&DCR P00,806
7	Pages:	1-38 and 1-39
	Delete:	Lines 32.53 through 32.56
	Add:	- a. All bolted openings shall be covered with 1/4-inch minimum thickness of fiberboard, securely attached, and further sealed all around with waterproof tapes. -
	Reason:	To incorporate E&DCR P00,923
8	Page:	1-39
	Delete:	Lines 33.31 through 33.35
	Add:	- Desiccants may be used provided that they comply with ANSI N45.2.2. -
	Reason:	To incorporate E&DCR P00,954
9	Page:	1-49, line 42.17
	Delete:	- maximum and -
	Reason:	To incorporate E&DCR P00,848

10	Page:	THERMAL TRANSIENT INDEX, Addendum 1	3.5
		to Rev. 2, after "12177-SK-A96"	3.6
	Add:	- 12177-SK-A98 2FWS*MOV21A,B -	3.7
	Reason:	To incorporate E&DCR P11,215	3.8
11	Page:	After 12177-SK-A96, Page 2 of 2	3.12
	Add:	Attached pages A3-4 through A3-7	3.13
		FEEDWATER THERMAL TRANSIENT,	3.14
		12177-SK-A98	3.15
	Reason:	To incorporate E&DCR P11,215	3.16
12	Pages:	VALVE DATA SHEET	3.20
	Delete:	Valve Data Sheet, page 4-3XXXXX,	3.21
		dated 1/22/81	3.22
	Add:	Revised VALVE DATA SHEET,	3.23
		page 4-3XXXXX, dated 12/3/81	3.24
	Reason:	Revised S&W requirement	3.25
13	Pages:	VALVE DATA SHEETS	3.29
	Add:	NEW VALVE DATA SHEETS,	3.30
		pages 4-3AAAAAA through 4-3CCCCCC,	3.31
		dated 12/3/81	3.32
	Reason:	New S&W requirement	3.33



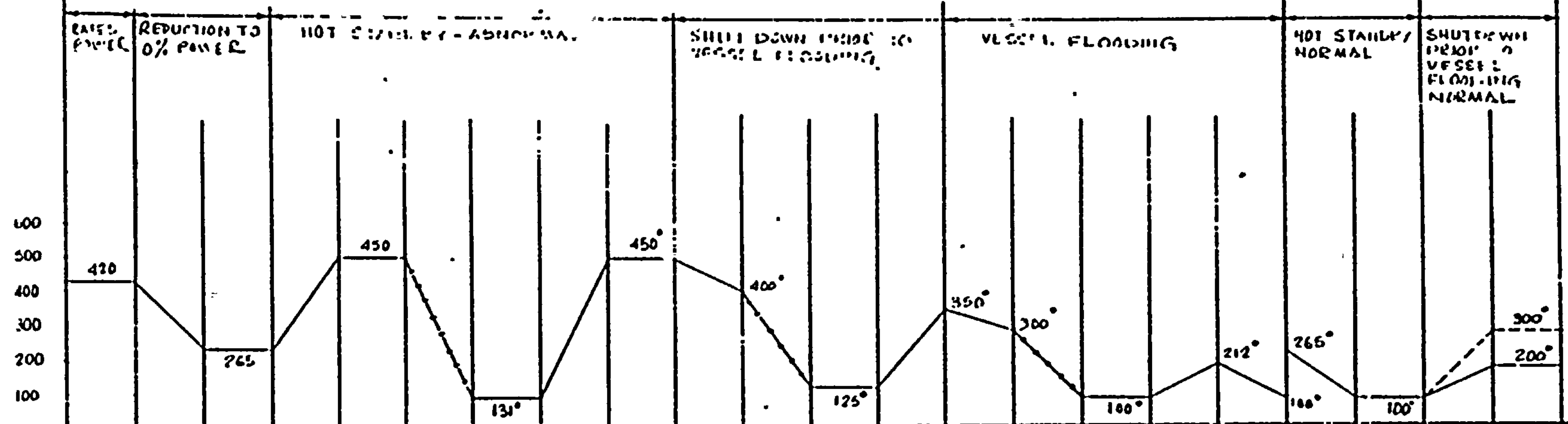
EVENT NO	1	2	2	3	4	4	4	4	5 & 7	5 & 7	5 & 7	6	6	6	9	9	9	8,10,11	8,10,11	8,10,11	8,10,11	8,10,11
DURATION OF TEMP	INDEF	—	INDEF	—	1800 SECS	—	3000 SECS	—	—	INDEF	—	—	INDEF	—	—	INDEF	—	—	—	INDEF	—	—
RATE OF TEMP CHANGE °F/HR	—	60	—	100	—	STEP	—	660	264	[illegible]	264	192	—	192	6200	—	3100	8700	700	—	STEP	340
EXPECTED NO OF CYCLES		130 →	→	120 →				→	10,400 →		→	2000 →		→	70 →		→	10 + 40 (140) →				→
TOTAL FLOW % VWO (SEE NOTE 4)	0 →				→	0 / 15	15	15 / 100	100 / 75	75	75 / 100	100 / 50	50	50 / 100	→		→	110	110 / 10	10 / 25 (1)	25	25 / 100
RPV PRESSURE - PSIG	ATM	ATM	1250	0 / 1000	→												→	1125	1125 / 240	→	1000	1000
VELOCITY IN 12" LINE - FT/HOUR	0 →		→	0 / 1548	→	5888		[illegible]	[illegible]		[illegible]	3816		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
VELOCITY IN 18" LINE - FT/HOUR	0 →		→	0 / 1535	→	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		6664	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
VELOCITY IN 24" LINE DOWNSTREAM OF MIXING TEE (CLASS 901) FT/H	0 →		→	0 / 1290	→	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	5851	[illegible]	[illegible]	[illegible]
VELOCITY IN 24" LINE (CLASS 901) DOWNSTREAM OF MIXING TEE FT/H	0 →		→	0 / 1607	→	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
VELOCITY IN 24" LINE (150) UPSTREAM OF MIXING TEE	0 →		→	0 / 0	→	8713		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1. Flow is increased to 25% after an indefinite hold time at 100°F. After an additional hold for 30 min. at about 100°F and 25% flow, the fw heating begins and the temperature increases to 255°F in a step.
2. — — — Indicates Transients applicable to feed water nozzle and in piping between nozzle and tee a point to below the nozzle.
3. —•—•— Indicates step change in temperature.
4. Unless otherwise noted, the flow is assumed to be linear with temperature trip.
5. These transients are ... [illegible]

This Histogram is developed based on the numerical results of calculation no 12177-A10-20-49

Q-A- CAT I
NUCLEAR SAFETY RELATED

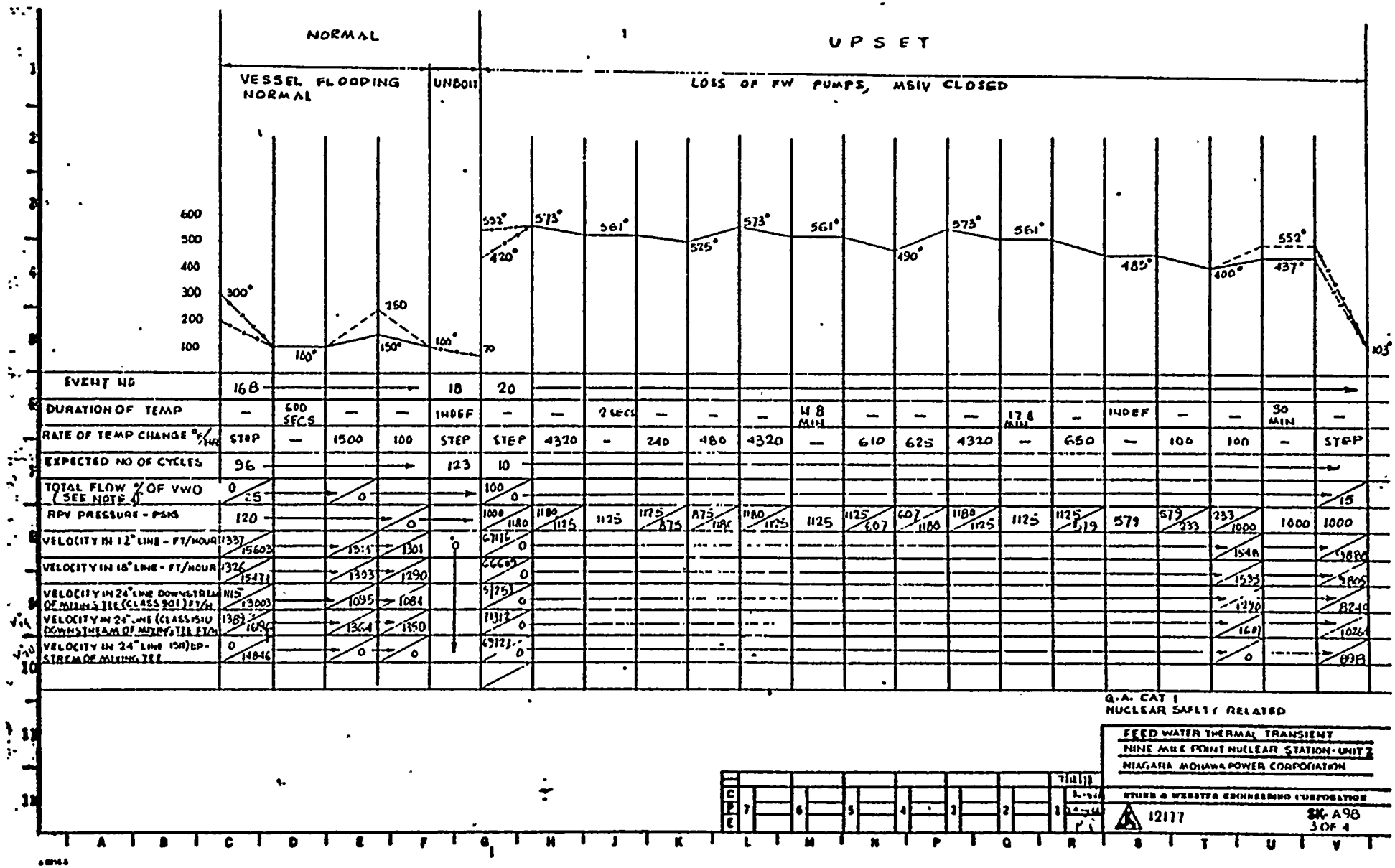
FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION-UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177
SK-A98
1 OF 4

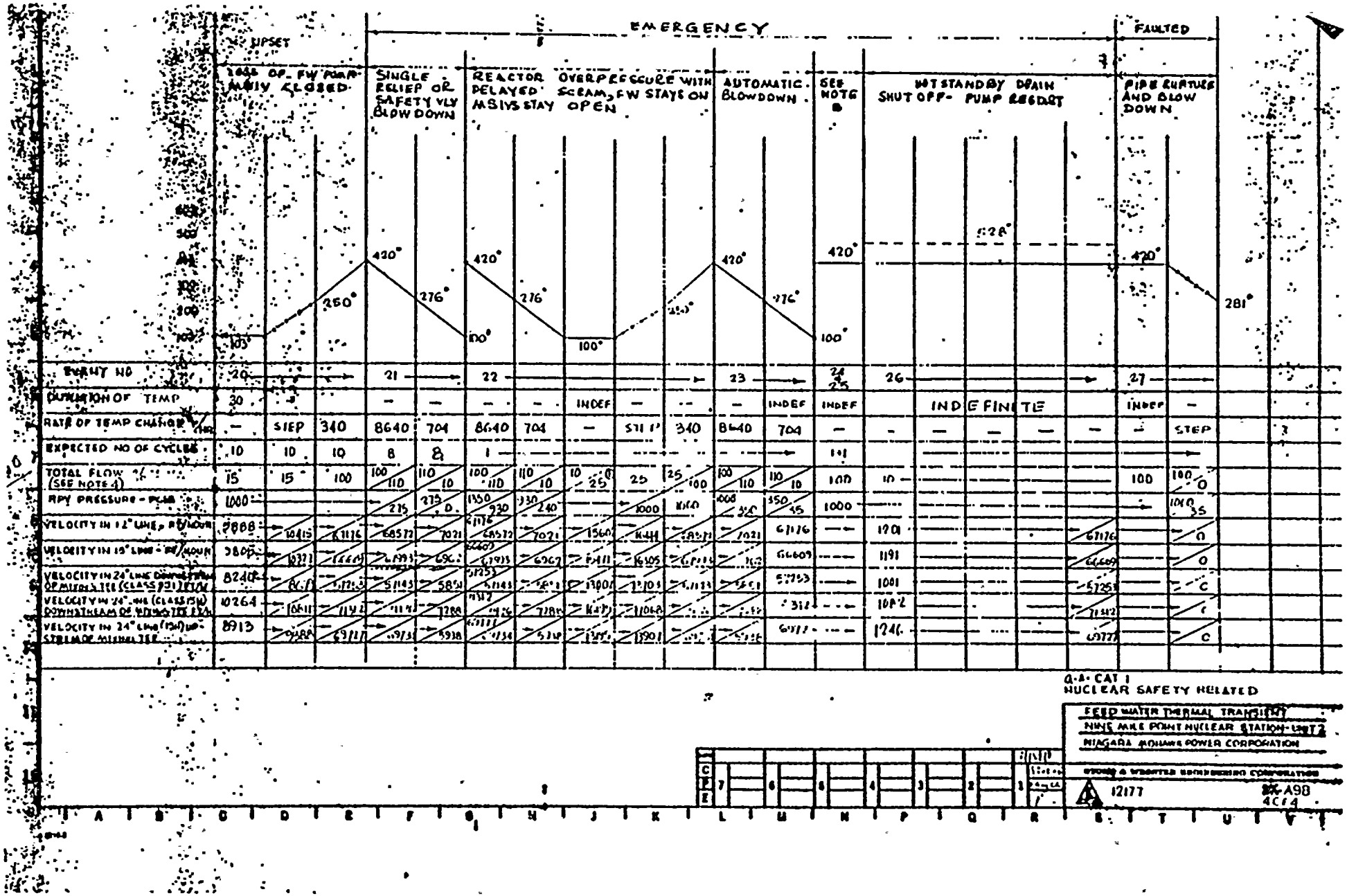


EVENT NO	12	13 →		14A →						15A →				16A →					14B →		15B →	
DURATION OF TEMP	INDEF	—	INDEF	—	30MIN	—	30MIN	—	INDEF	—	—	30 MIN	—	—	—	10MIN	—	—	—	INDEF	—	30MIN
RATE OF TEMP CHANGE °F/HR	—	310	—	5500	—	STEP	—	10,500	—	300	STEP	—	7500	100	STEP	—	3360	100	1980	—	3000	—
EXPECTED NO OF CYCLES	—	111	111	15 →													→		96 →			→
TOTAL FLOW % OF VWO (SEE NOTE 4)	100	100 / 25	25	25 / 0	→	25	→	0			25	→	0	→	25	→	0	0	25 →		0	→
RPV PRESSURE - PSIG	1000	→							→	1000 / [illegible]	→		120		→	120 / 0	→		1100	1000 / 120	→	
VELOCITY IN 12" LINE - FT/HOUR	61176	15580		1564		15119		1564		1498	15671		1441	1403	15603		1344	1301	16580 / 15643		1337	→
VELOCITY IN 16" LINE - FT/HOUR	66609	16440		1551		15286		1514		1486	[illegible]		1435	1391	15411		1333	1290	6410 / 15411		1326	→
VELOCITY IN 24" LINE DOWNSTREAM OF MIXING TEE (CLASS 3011) FT/H	57253	13811		1304		13099		1304		1217	[illegible]		1206	1169	13603		1120	1084	13817 / 13603		1115	→
VELOCITY IN 24" LINE (CLASS 1) DOWNSTREAM OF MIXING TEE FT/H	71312	17210		1671		16341		1624		1556	16766		1583	1451	16196		1396	1350	17210 / 16196		1389	→
VELOCITY IN 24" LINE (5011) UPSTREAM OF MIXING TEE	69727	16115		0		11924		0		0	14910		0	0	14646		0	0	15775 / [illegible]		0	→

Q.A. CAT I
NUCLEAR SAFETY RELATED

FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177
SK-A98
2 OF 4


NORMAL
UPSET
VESSEL FLOODING NORMAL
UNDOIL
LOSS OF FW PUMPS, MSIV CLOSED
600
500
400
300
200
100
300°
180°
250
150°
100°
70
532°
420°
573°
561°
525°
573°
561°
490°
573°
561°
485°
400°
552°
437°
105°
EVENT NO
168
18
20
DURATION OF TEMP
600 SECS
INDEF
2 SECS
18 MIN
17.8 MIN
INDEF
30 MIN
RATE OF TEMP CHANGE °F/HR
STEP
1500
100
STEP
4320
240
480
4320
610
625
4320
650
100
100
EXPECTED NO OF CYCLES
96
123
10
TOTAL FLOW % OF VWO (SEE NOTE 4)
RPV PRESSURE - PSIG
VELOCITY IN 12" LINE - FT/HOUR
VELOCITY IN 18" LINE - FT/HOUR
VELOCITY IN 24" LINE DOWNSTREAM OF MIXING TEE (CLASS 901) FT/H
VELOCITY IN 24" LINE (CLASS 151) DOWNSTREAM OF MIXING TEE FT/H
VELOCITY IN 24" LINE (SH) UPSTREAM OF MIXING TEE
Q.A. CAT I
NUCLEAR SAFETY RELATED
FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177
SK-A98
3 OF 4



Q-A CAT I
NUCLEAR SAFETY RELATED

FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION-UNIT 2
NIAGARA MOHAWK POWER CORPORATION

STONE & WEBSTER ENGINEERING CORPORATION

12177

A98
4C14

STONE & WEBSTER ENGINEERING CORPORATION Addendum 3 to Rev. 1

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 12/3/81

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HMdeb

S & W Mark No.	2ASS-MOV152	2ICS-MOV170
Valve		
Quantity	One	One
Size	4"	1"
Type	Gate	Globe
Service	Shutoff	Steam line warm-up
Fluid	Saturated Steam	Steam
S & W Description No.	VGW090-F-4MVQ	VOS150-F-2Q
Rating & Material	900# / SA105	1500# / SA105
End Preparation	Butt Weld	Socket Weld
Normal Operating Pressure - psi	950 psig	1000 psig
Max. Diff. Press. - psi	300	1158 psig
Temp. Range - F	40 - 540	40° - 575°
Max. Flow - gpm	13,400 #/hr	Sonic Velocity
Design Temperature	575°F	575°F
Design Pressure	1250 psig	1250 psig
Pipe Schedule	120	N/A
"C" Bore	3.692"	N/A
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power - Volts / Phase / Hz	575/3/60	575/3/60
Insulation Class	Std. Cl. B	Cl. RH
Normal Ambient Temp. - C	65.5	65.5
Location	Outside Prim. Containment	Inside Prim. Containment
No. of Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Testing	Compliance to "Operability" Testing Section	
Special Requirements		1) Active Valve;
REV. 3		
REV. 2		
REV. 1		

▲5038.60

STONE & WEBSTER ENGINEERING CORPORATION Addendum 3 to Rev 2

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3BBBBBB
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 12/3/81

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdals

1	S & W Mark No.	2CCP-MOV94A	2CCP-MOV94B
2			
3	Valve		
4	Quantity	One	One
5	Size	4"	4"
6	Type	Globe	Globe
7	Service		
8	Fluid		
9	S & W Description No.	VOWQ15-H-2KQ	VOWQ5-H-2KQ
10	Rating & Material	150# / SA105	150# / SA105
11	End Preparation	Buttweld	Buttweld
12	Normal Operating Pressure - psi		
13	Max. Diff. Press. - psi		
14	Temp. Range - F	Valve	Valve
15	Max. Flow - gpm		
16	Design Temperature		
17	Design Pressure	on Hold	on Hold
18	Pipe Schedule		
19			
20	"B" Bore		
21	Trim		
22			
23			
24			
25	Motor Operator		
26	Enclosure		
27	Power - Volts / Phase / Hz		
28	Insulation Class		
29	Normal Ambient Temp. - C		
30			
31			
32	Location		
33			
34			
35			
36			
37			
38	No. of Limit Switch Contacts		
39	Close	4 Open 4 Closed	4 Open 4 Closed
40	Open	4 Open 4 Closed	4 Open 4 Closed
41			
42			
43			
44			
45			
46	Special Requirements		
47			
48			
49			
50			
51			
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

▲5038.60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET Addendum 3 to Rev 2

BY ENGINEERS

PAGE 4-3CCCCCC
SPEC. NO. NMP2-P304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point Nuclear Station-Unit 2 BY: HAdels DATE 12/3/81

	S & W Mark No.	2CCP-MOV273	2MSS-MOV207
2			
3	Valve		
4	Quantity	One	One
5	Size	8"	6"
6	Type	Gate	Globe
7	Service		Open/Close
8	Fluid		Steam/Water
9	S & W Description No.	VGW015-P-2KQ	VQW060-B-1MQ
10	Rating & Material	150# / SA105	600# / SA105
11	End Preparation	Buttweld	Buttweld
12	Normal Operating Pressure - psi		964 psia
13	Max. Diff. Press. - psi		1130 psi
14	Temp. Range - F	Valve	65°-559°
15	Max. Flow - gpm		2.55
16	Design Temperature		575°F
17	Design Pressure	on Hold	1250psig
18	Pipe Schedule		80
19			
20	"C" Bore		5.828"
21	Trim		Stellite
22			
23			
24			
25	Motor Operator		
26	Enclosure		NEMA 4
27	Power-Volts/Phase/Hz		575/3/60
28	Insulation Class		CL RH
29	Normal Ambient Temp.-C		65.5°
30			
31			
32	Location		Inside Primary Contain.
33			
34			
35			
36			
37			
38	No. of Limit Switch Contacts		
39	Close	4 Open 4 Closed	4 Open 4 Closed
40	Open	4 Open 4 Closed	4 Open 4 Closed
41			
42			
43			
44			
45			
46	Special Requirements		
47			
48			
49			
50			
51			
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

▲5038 60

Addendum 3 to Rev 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3XXXXX
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE 11/22/81 12/3/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
11Adds
BY: JJP

S & W Mark No.	2 ICS * MOV 143	2 ICS * MOV 116
Valve		
Quantity	1	1
Size	2"	2"
Type	GLOBE	GLOBE
Service	SHUTOFF	THROTTLE
Fluid	WATER	WATER
S & W Description No.	V0S150-F-2EQ	V0S150-F-2Q
Rating	1500#	1500#
Material	SA 105	SA 105
End Preparation	SW	SW
Normal Oper. Press. - psiA	19.2	1293
Max. Diff. Press. - psi	1525	1525
Temperature Range - F	40-170	40-170
Maximum Flow GPM	75	25
Design Pressure - psig	1525	1525
Design Temperature - F	170	170
Pipe Schedule	NA	NA
Pipe Bore	NA	NA
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL RH	CL RH
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI. CONTAINMENT	OUTSIDE PRI. CONTAINMENT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements	1. Active Valve	
	2. Low Seat leakage	
	3. Close 5 Sec. Max.	

Rev 3

I

NUCLEAR SAFETY RELATED

J.O. No. 12177
Spec No. NMP2-P304R

Addendum 2 to Rev. 2
Page A2-1 of 2

Addendum 2
Specification for

February 9, 1981
BK8102170006
G6.28

MOTOR-OPERATED CARBON STEEL VALVES
ASME III, CLASSES 1, 2, AND 3

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

Seller: Velan Engineering Companies

COMMONWEALTH OF MASSACHUSETTS
RAOUL S. Du BRUL
No. 27781
REGISTERED PROFESSIONAL ENGINEER

APPROVED	Name	Date
Preparer	J. Joyce	1/30/81
Lead Engr	[illegible]	2/9/81
Specialist	AR Joyce/BSO	2/4/81
Proj Engr	[illegible]	2/9/81
Qual Assur	[illegible]	2/9/81
Mtrls Engg	[illegible]	2/9/81
Const Dept	N/A	

This design specification is hereby certified to be correct, complete, and in compliance with the ASME Boiler and Pressure Vessel Code Section III, NA-3250, dated July 1, 1974, and Addenda dated June 30, 1974, December 31, 1974, June 30, 1975, and December 31, 1975.

Signed: Raoul S. Du Brul
Date: FEBRUARY 9, 1981
Prof. Eng. State: MASSACHUSETTS
Registration No.: 27781

Independent Reviewer: AR Joyce I/BSO
Date: FEBRUARY 9, 1981

Item		Change to Specification	1.49
1	Page:	Valve Data Sheet	1.52
	Delete:	Data Sheet Pages 4-300, and 4-3TTTTT	1.53
	Add:	Revised Data Sheets 4-300, and	1.54
		4-3TTTTT	1.55
	Reason:	Revised requirement	1.56
2	Page:	After Valve Data Sheet, page 4-3TTTTT	2.2
	Add:	Add New Valve Data Sheets 4-3UUUUU	2.3
		through 4-3ZZZZZ	2.4
	Reason:	New S&W Requirement	2.5

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 300
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: QS

	2 ICS - MOV 120		2 ICS - MOV 124	
S & W Mark No.				
GE #	E51-F045		E51-F059	
Valve				
Quantity	One		One	
Size	4 Inch		4 Inch	
Type	Globe		Gate	
Service	Shutoff		Shutoff	
Fluid	Steam		Water	
S & W Description No.	VGW090 - C - 2TQ	1	VGW090 - F - 2ZSQ	1
Rating	900#		900#	
Material	SA105		SA105	
End Preparation	Butt Weld		Butt Weld	
Normal Oper. Press.-psi	1125		1265	
Max. Diff. Press.-psi	1140	1	1265	
Temperature Range - °F	70 - 560		40 - 100	
Maximum Flow	33,000 lb/hr		600 gpm	
Design Pressure - psig.	1250		1684	
Design Temperature - F	575		170	
Pipe Schedule	Sch. 120	1	Inlet: SCH 120	2
			Outlet: Sch. 10S	
"C" Bore	3.692"	1	Inlet: "C" = 3.692	2
			Outlet: "B" = 4.26	R2-2
Trim	Stellite		Stellite	
Motor Operator				
Enclosure	NEMA 4		NEMA 4	
Power-Volts/Phase/Hz	120 v dc		120 v dc	
Insulation Class	Cl. H(R)		Cl. H(R)	
Normal Ambient Temp.-C	65.5		65.5	
Location	Outside Pri. Containment		Outside Pri. Containment	
No. Limit Switch Contacts				
Close	4 Open 4 Closed		4 Open 4 Closed	
Open	4 Open 4 Closed		4 Open 4 Closed	
Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	
	2) Time to operate:		2) Welded transition piece required.	
	a) Close - 15 sec (max)			
	b) Open - 15 sec (max)			
REV. 3				
REV. 2				
REV. 1				

A3038.60

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4-3TTTTT
SPEC. NO. NMP2-P
J.O. NO. 12177
DATE 12/7/79

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 ICS - MOV 128 (E51 - F063)	
Valve		
Quantity	ONE	
Size	10 INCH	
Type	GATE	
Service	SHUTOFF	
Fluid	STEAM	
S & W Description No.	VGW090-F-1MDQ12	
Rating	900#	
Material	SA 105	
End Preparation	BUTTWELD	
Normal Oper. Press. - psi	1140	
Max. Diff. Press. - psi	1140	
Temperature Range - F	70 - 560	
Maximum Flow	207,300 #/HR	
Design Pressure - psig	1250	
Design Temperature - F	575	
Pipe Schedule	SCH 80	
Pipe Bore ("C" BORE)	9.671"	
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	RH	
Normal Ambient Temp.-C	65.5	65.5
Location	INSIDE PRI. CONTAINMENT	
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements (1)	ACTIVE VALVE	
(2)	LOW SEAT LEAKAGE	
(3)	INSIDE ISOLATION	
(4)	TIME TO OPERATE:	
	a/ CLOSE 15 SEC (MAX)	
	b/ OPEN 15 SEC (MAX)	
(5)	TEST CONN. REQ'D.	

Rev 3

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4-3UUUUU
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1/22/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: JJP

S & W Mark No.	2MSS*MOV 208	
Valve		
Quantity	1	
Size	2"	
Type	GLOBE	
Service	SHUTOFF	
Fluid	STEAM	
S & W. Description No.	YOS150-B-1Q	
Rating	1500#	
Material	SA 182 F11	
End Preparation	SW	
Normal Oper. Press. - psia	964	
Max. Diff. Press. - psi	1250	
Temperature Range - F	—	
Maximum Flow	—	
Design Pressure - psig	1250	
Design Temperature - F	575	
Pipe Schedule	NA	
Pipe Bore	NA	
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL B	
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI. CONTAINMENT	
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		

REV 3

ADDENDUM. 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3VVVVV
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1/12/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

	S & W Mark No.	2MSS*MOV108	2MSS*MOV118
	Valve		
	Quantity	1	1
	Size	2"	2"
	Type	GLOBE	GLOBE
	Service	SHUTOFF	SHUTOFF
	Fluid	STEAM	STEAM
	S & W Description No.	V05150-F-1Q	V05150-F-1Q
	Rating	1500#	1500#
	Material	SA 105	SA 105
	End Preparation	SW	SW
	Normal Oper. Press. - psia	964	964
	Max. Diff. Press. - psi	1250	1250
	Temperature Range - F	—	—
	Maximum Flow	—	—
	Design Pressure - psig	1250	1250
	Design Temperature - F	575	575
	Pipe Schedule	NA	NA
	Pipe Bore	NA	NA
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	CL RH	CL RH
	Normal Ambient Temp.-C	65.5	65.5
	Location	INSIDE PRI CONTAINMENT	INSIDE PRI. CONTAINMENT
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements		

REV 3

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3WWNWW
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE 1/22/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

	S & W Mark No.	2MSS*MOV119	2MSS*MOV189
	Valve		
	Quantity	1	1
	Size	2"	2"
	Type	GLOBE	GLOBE
	Service	SHUTOFF	SHUTOFF
	Fluid	STEAM	STEAM
	S & W Description No.	V05150-F-1Q	V05150-F-1Q
	Rating	1500#	1500#
	Material	SA 105	SA 105
	End Preparation	SW	SW
	Normal Oper. Press. - psia	964	964
	Max. Diff. Press. - psi	1250	1250
	Temperature Range - F	—	—
	Maximum Flow	—	—
	Design Pressure - psig	1250	1250
	Design Temperature - F	575	575
	Pipe Schedule	NA	NA
	Pipe Bore	NA	NA
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	CL RH	CL RH
	Normal Ambient Temp.-C	65.5	65.5
	Location	INSIDE PRI. CONTAINMENT	INSIDE PRI. CONTAINMENT
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements		

Rev 3

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3XXXXX
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE 11/22/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 ICS * MOV 143	2 ICS * MOV 116
Valve		
Quantity	1	1
Size	2"	2"
Type	GLOBE	GLOBE
Service	SHUTOFF	THROTTLE
Fluid	WATER	WATER
S & W Description No.	VOS150-F-2EQ	VOS150-F-2Q
Rating	1500#	1500#
Material	SA 105	SA 105
End Preparation	SW	SW
Normal Oper. Press. - psiA	19.2	1293
Max. Diff. Press. - psi	1525	1525
Temperature Range - F	40-170	40-170
Maximum Flow	75	25
Design Pressure - psig	1525	1525
Design Temperature - F	170	170
Pipe Schedule	NA	NA
Pipe Bore	NA	NA
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL RH	CL RH
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI. CONTAINMENT	OUTSIDE PRI. CONTAINMENT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		
REV 3		

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3YYYYY
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1/22/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

	2 SWP *MOV 67A	2 SWP *MOV 67B
S & W Mark No.		
Valve		
Quantity	1	1
Size	4"	4"
Type	GATE	GATE
Service	SHUTOFF	SHUTOFF
Fluid	WATER	WATER
S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
Rating	150#	150#
Material	SA105	SA105
End Preparation	BW	BW
Normal Oper. Press. - psi	123	123
Max. Diff. Press. - psi	108	108
Temperature Range - F	32/77	32/77
Maximum Flow	400 GPM	400 GPM
Design Pressure - psig	150	150
Design Temperature - F	130	130
Pipe Schedule	STD WT.	STD WT.
Pipe Bore "B"	4.026"	4.026"
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL B	CL B
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRIMARY CONTAINMENT	OUTSIDE PRI. CONTAINMENT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		

REV 3
REV 2

ADDENDUM 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 3 ~~22222~~
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1/22/81

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

1	S & W Mark No.	2ASS - MOV148	
2			
3	Volve		
4	Quantity	1	
5	Size	6"	
6	Type	GATE	
7	Service	SHUTOFF	
8	Fluid	STEAM	
9	S & W Description No.	VGW090-F-4TVQ	
10	Rating	900#	
11	Material	SA105	
12	End Preparation	BUTTWELD	
13	Normal Oper. Press. - psig	965	
14	Max. Diff. Press. - psi	1250	
15	Temperature Range - F	0 - 575	
16	Maximum Flow	142,760 #/HR	
17	Design Pressure - psig	1250	
18	Design Temperature - F	575	
19	Pipe Schedule	SCH 120	
20			
21	Pipe Bore "C"	5.600"	
22			
23			
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	CL B	
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location		
33			
34			
35	No. Limit Switch Contacts		
36	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
37	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
38			
39			
40			
41	Special Requirements	COMPLIANCE TO	
42		OPERABILITY TESTING	
43		SECTION OF THIS	
44		SPECIFICATION IS	
45		REQUIRED.	
46			
47			
48			
49			
50			
51			
52			
53			

REV 3

I

NUCLEAR SAFETY RELATED

J.O. No. 12177
Spec No. NMP2-P304R

Addendum 1 to Rev. 2
Page A1-1 of 5
November 3, 1980

Addendum 1
Specification for

BK8011030002
G6.28

MOTOR-OPERATED CARBON STEEL VALVES
ASME III, CLASSES 1, 2, AND 3

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

Seller: Velan Engineering Companies

COMMONWEALTH OF MASSACHUSETTS
RAOUL S. Du BRUL
No. 27781
REGISTERED PROFESSIONAL ENGINEER

APPROVED	Name	Date
Preparer		10-23-80
Lead Engr		10/24/80
Specialist		10/23/80
Proj Engr		10/24/80
Qual Assur		10/24/80
Mtrls Engg		10/27/80
Const Dept	NA	

This design specification is hereby certified to be correct, complete, and in compliance with the ASME Boiler and Pressure Vessel Code Section III, NA-3250, dated July 1, 1974, and Addenda dated June 30, 1974, December 31, 1974, June 30, 1975, and December 31, 1975.

Signed:
Date: 10/24/80
Prof. Eng. State: MASS
Registration No.: 27781

Independent Reviewer:
Date: 10/23/80

Item	Change to Specification	
1	Pages: 1-58, 1-59, 1-60 of Revision 2	1.52 1.53
	Delete: Lines 50.4 through 52.53	1.54
	Add: - New documentation distribution list as follows: -	1.55 1.56
	Reason: S&W revised requirement	1.57

DOCUMENTATION 2.3

Documentation by Seller 2.6

The basic documentation required of the Seller shall include all test reports, data sheets, and certificates which are required by any of the applicable codes, and state and local authorities. These shall include, but not by way of limitation, the following: 2.8 2.9 2.11 2.12

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Welding Procedures	4	-	-	1	-	2.16 2.17 2.19
Welding Procedure Qualifications	4	-	-	1	-	2.34 2.35
Welder Qualifications	-	-	-	1	-	2.37
Heat Treatment Procedures	4	-	-	1	-	2.40 2.41
Heat Treatment Records	-	2	-	1	-	2.44
NDE Procedures	4	-	-	1	-	2.46
NDE Personnel Qualifications	-	-	-	1	-	2.50 2.51
Certified Material Test Reports for Pressure-Retaining Parts (Including Impact Tests & Weld Filler Metal)	-	2	-	1	-	2.54 2.55 2.56 2.57 2.58
Certified NDE Reports	-	2	-	1	-	3.2
Certified Stress Reports (Class 1 only)	4	2	-	1	-	3.4 3.5
Radiographic Film	-	-	-	1	-	3.7

Item Change to Specification

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Hydrostatic Shell Test Reports	-	2	-	1	-	3.9 3.10
Hydrostatic Seat Test Reports	-	2	-	1	-	3.13 3.14
Dielectric Test Reports	4	2	-	1	-	3.17
Locked Rotor Test Reports	4	2	-	1	-	3.19 3.20
Performance Test Report (including operating volts and amps)	4	2	-	1	-	3.22 3.23 3.24
Seismic Certificate of Compliance	-	2	-	1	-	3.26 3.27
Motor Operator Prototype Test Data Report	4	-	-	1	-	3.29 3.30
Motor Operator Test Procedure	4	-	-	1	-	3.32 3.33
Pneumatic Seat Leakage Test Procedure	4	-	-	1	-	3.35 3.36
Pneumatic Seat Leakage Test Reports	4	2	-	1	-	3.38 3.39
Thrust/Torque Test Reports	4	2	-	1	-	3.41 3.42
Stalled Thrust/Torque Test Reports	4	2	-	1	-	3.44 3.45
Motor Operator Sizing Calculation	4	-	-	1	-	3.47 3.48
Seismic Calculation	4	-	-	1	-	3.50
Seismic Testing Test Report	4	-	-	1	-	3.52 3.53
Operability Testing Test Report	4	2	-	1	-	3.55 3.56

Item Change to Specification

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Dimensional Check Certification	-	2	-	1	-	3.58 4.1
Wall Thickness Measurement Procedure	4	-	-	1	-	4.4 4.5
Wall Thickness Measurement Documentation	-	2	-	1	-	4.9 4.10
Shop Cleaning Procedures	4	-	-	1	-	4.13 4.14
Packaging and Shipping Procedure	4	-	-	1	-	4.24 4.25
Records for Preparation for Shipment (in accordance with Section 8 of ANSI-N45.2.2)	-	2	-	1	-	4.27 4.28 4.29 4.30 4.31
Storage Requirements	4	-	-	1	1	4.33 4.34
Documentation Checklist	4	2	-	1	-	4.37
Manufacturer's Data Reports	-	2	-	1	1	4.40 4.41

EPE - Engineers' Project Engineer - to be submitted in accordance with CORRESPONDENCE paragraph. 4.44 4.45
ESI - Engineers' Shop Inspector - to be submitted as arranged by ESI 4.48 4.49
Mail - Mail or express by the Seller to the jobsite, at the time of shipment. Address to be given by the ESI. Detailed identification of contents and proof of shipment to be retained by the Seller, available to the ESI. 4.51 4.52 4.53 4.54 4.55
MF - Manufacturer's file, available to the ESI 4.57
S - With the shipment to which applicable 4.58

2 Page: 4-2B of Revision 2 5.2
Add: After line 2.50 5.3

Item	Change to Specification		
	VOWO90-D	Globe valve 900 lb	5.6
		SA216 WCB CS body	5.7
		pressure seal bonnet	5.8
		stellite trim OS&Y	5.9
		swivel plug integral	5.10
		seat	5.11
	Reason:	Provision for cast steel valve	5.14
		required	5.15
3	Page:	Valve Data Sheet	5.18
	Delete:	4-3GGGG and 4-30000	5.19
	Add:	Revised Data Sheet 4-3GGGG	5.20
		and 4-30000	5.21
	Reason:	Material change and deletion of	5.22
		welded transition piece	5.23
4	Page:	4-4 of Revision 2	5.27
	Delete:	Page 4-4 of Revision 2 and	5.28
		associated thermal transients	5.29
	Add:	New page 4-4 and new thermal	5.30
		transients in accordance with	5.31
		attachment	5.32
	Reason:	S&W revised requirement	5.33

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DATE

1	S & W Mark No.	2 RHS - MOV 40A		2RHS - MOV 40B
2	GE #	E12-F053A		E12-F053A
3	Valve			
4	Quantity	One		One
5	Size	12 Inch		12 Inch
6	Type	Globe		Globe
7	Service	Throttle	1	Throttle 1
8	Fluid	Water		Water
9	S & W Description No.	VGW090-D-.12Q	R2-1	VGW090-D-12Q R2-1
10	Rating	900#		900#
11	Material	SA-216 WCB	R2-1	SA-216 WCB R2-1
12	End Preparation	Butt Weld		Butt Weld
13	Normal Oper. Press.-psi	350	R2	350 R2
14	Max. Diff. Press.-psi	350	R2	350 R2
15	Temperature Range - °F	70 - 540		70 - 540
16	Maximum Flow	7450 gpm		7450 gpm
17	Design Pressure - psig.	1550		1550
18	Design Temperature - F	575		575
19	Pipe Schedule Inlet:	Std.		Std.
20	Outlet:	Sch. 100		Sch.100
21	"e" Bore Inlet:	12.053"		12.053"
22	Outlet	11.234"		11.234"
23	Trim	Stellite		Stellite
24				
25	Motor Operator			
26	Enclosure	NEMA 4		NEMA 4
27	Power-Volts/Phase/Hz	575/3/60		575/3/60
28	Insulation Class	Cl. H(R)		Cl. H(R)
29	Normal Ambient Temp.-C	65.5		65.5
30				
31				
32	Location	Outside Pri. Containment		Pri. Containment
33				
34	No. Limit Switch Contacts			
35	Close	4 Open 4 Closed		4 Open 4 Closed
36	Open	4 Open 4 Closed		4 Open 4 Closed
37				
38				
39	Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE
40		2) Low Seat Leakage		2) Low Seat Leakage
41		3) Outside Iso.		3) Outside Iso.
42		4) Time to operate:		4) Time to operate:
43		Open - 29sec (max)	1	Open - 29sec (max) 1
44		Close - 29sec (max)		Close - 29sec (max)
45		5) POSITION TRANS-		5) POSITION TRANS-
46		-MITTER REQ'D	2	-MITTER REQ'D 2
47				
48				
49				
50				
51				
52				
53				
	REV. 3 CCT 10/1H7X			
	REV. 2			
	REV. 1			

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3 CCCO
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

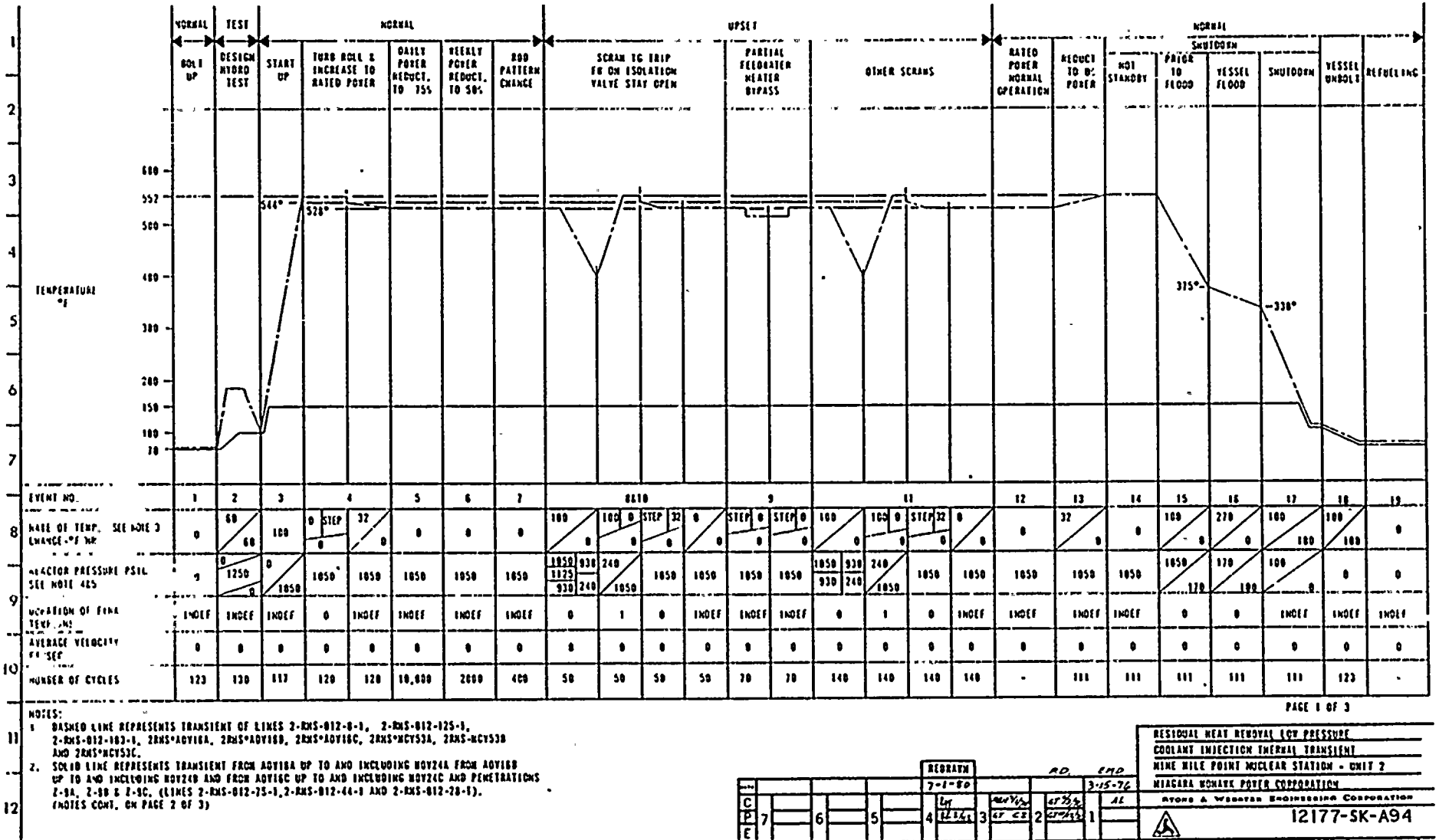
CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: JS

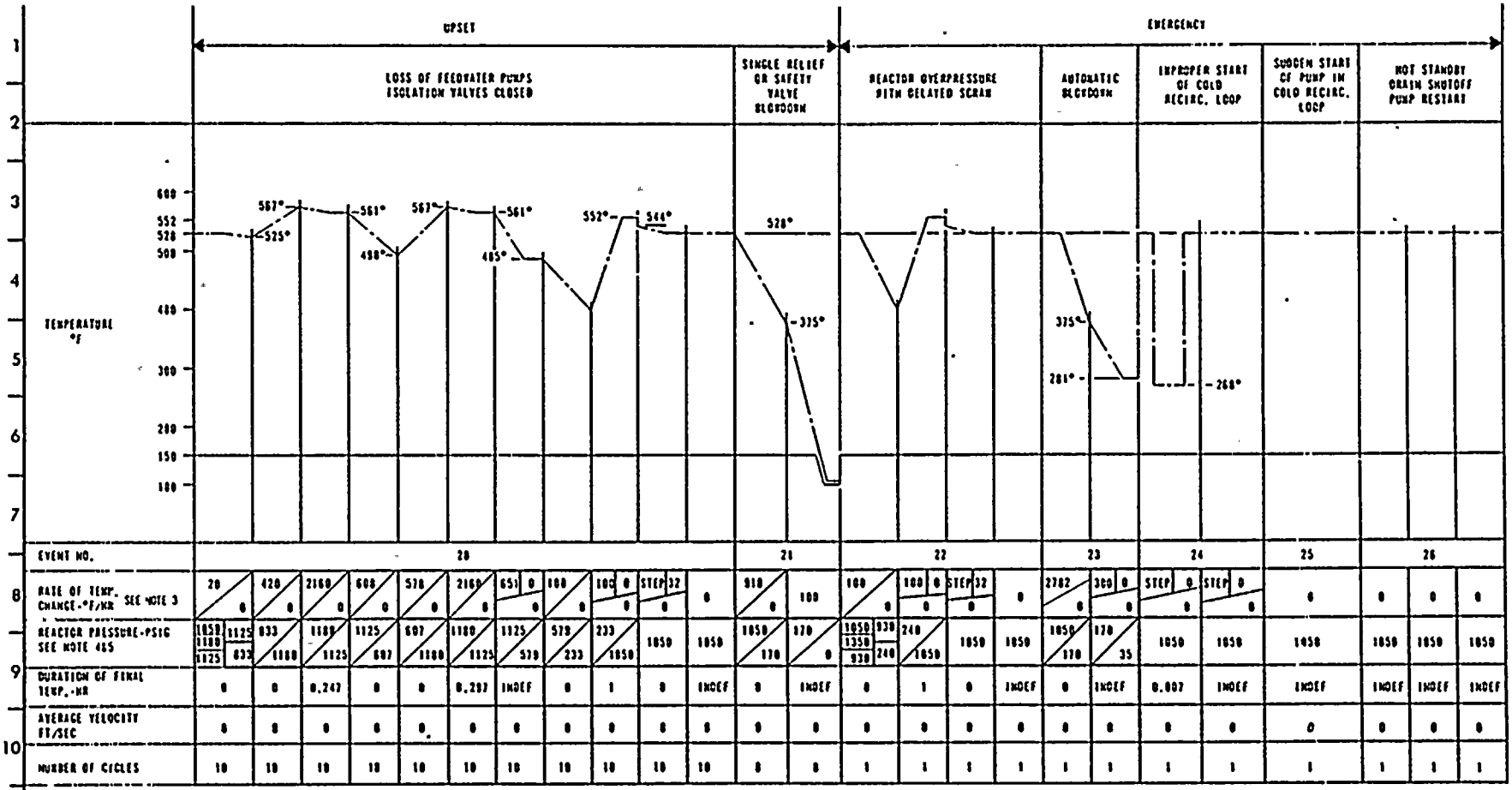
S & W Mark No.	2 RHS - MOV 113	2 RHS - MOV 112
6E #	E12-F008	E12-F009
Valve		
Quantity	One	One
Size	20 Inch	20 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VG1090 - F - 12Q [3]	VG1090 - F - 1MQ [3]
Rating	900#	900#
Material	SA-105 [3]	SA-105 [3]
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1000	1000
Max. Diff. Press.-psi	150 [R2]	150 [R2]
Temperature Range - °F	70 - 540	70 - 540
Maximum Flow	14,000 GPM	14,000 GPM
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule Inlet:	Sch. 80	Sch. 80
Outlet:	XS	Sch. 40
"C" Bore Inlet:	18.155"	18.155"
Outlet:	18.094"	18.155"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Prl. Containment	Inside Prl. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Inside Iso.
	4) Time to operate:	4) [R2-1]
	a) Close - 29 sec (max)	required.
	b) Open - 29 sec (max)	5) Time to operate
		a) Close - 29 sec (max)
		b) Open - 29 sec (max)

REV.3 CC: 10/11/77
REV.2 J
REV.1

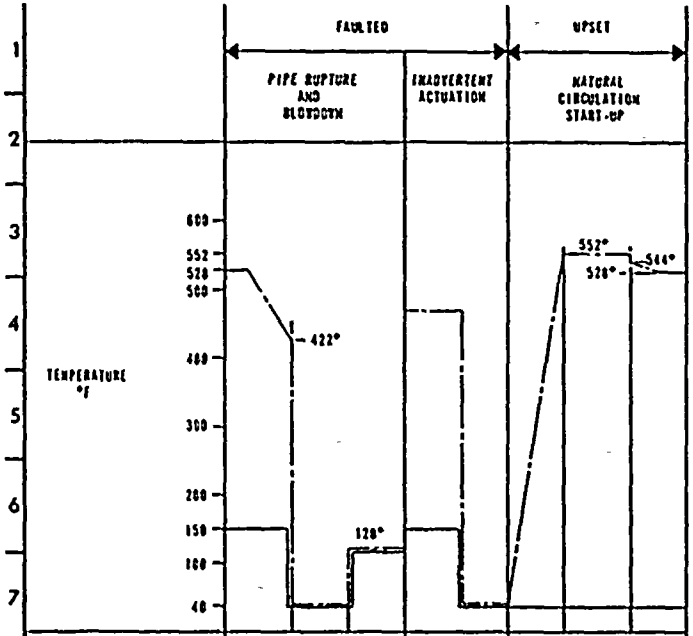
THERMAL TRANSIENT INDEX

Thermal Transient Drawing Number	S&W Valve Mark No.
12177-SK-A94	2RHS*MOV24A, B, C (Solid)
12177-SK-A95	2RHS*MOV112, 113 (Dashed)
12177-SK-A96	2ICS*MOV126 (Dashed)
	2RHS*MOV104 (Dashed)
12177-SK-A103	2ICS*MOV128 MOV121 MOV170
12177-SK-A104	2MSI*MOV1A, B 2MSI*MOV2A, B 2MSS*MOV111 2MSS*MOV112
12177-SK-A105	2CSL*MOV104 (Solid)
12177-SK-A107	2RHS*MOV40A, B 2RHS*MOV67A, B (Dashed)


NORMAL
TEST
NORMAL
UPSET
NORMAL
SHUTDOWN
BOLT UP
DESIGN HYDRO TEST
START UP
TURB ROLL & INCREASE TO RATED POWER
DAILY POWER REDUCT. TO 75%
WEEKLY POWER REDUCT. TO 50%
ROD PATTERN CHANGE
SCRAM TO TRIP FO ON ISOLATION VALVE STAY OPEN
PARTIAL FEEDWATER HEATER BYPASS
OTHER SCRAMS
RATED POWER NORMAL OPERATION
REDUCT TO RC POWER
HOT STANDBY
PRIOR TO FLOOD
VESSEL FLOOD
SHUTDOWN
VESSEL UNBOLT
REFUELING
TEMPERATURE °F
600
552
500
400
300
200
150
100
70
544°
528°
315°
338°
EVENT NO.
RATE OF TEMP. CHANGE °F/HR
REACTOR PRESSURE PSIG SEE NOTE 4&5
LOCATION OF FINAL TEMPERATURE
AVERAGE VELOCITY FT/SEC
NUMBER OF CYCLES
INDEF
PAGE 1 OF 3
NOTES:
1. DASHED LINE REPRESENTS TRANSIENT OF LINES 2-RMS-812-8-1, 2-RMS-812-125-1, 2-RMS-812-183-1, 2RMS*AOV16A, 2RMS*AOV16B, 2RMS*AOV16C, 2RMS*MCV53A, 2RMS-MCV53B AND 2RMS*MCV53C.
2. SOLID LINE REPRESENTS TRANSIENT FROM AOV16A UP TO AND INCLUDING MOV24A FROM AOV16B UP TO AND INCLUDING MOV24B AND FROM AOV16C UP TO AND INCLUDING MOV24C AND PENETRATIONS Z-8A, Z-8B & Z-8C, (LINES 2-RMS-812-75-1, 2-RMS-812-44-1 AND 2-RMS-812-28-1).
(NOTES CONT. ON PAGE 2 OF 3)
REGRAPH 7-1-80
AD. 3-15-76
RESIDUAL HEAT REMOVAL LOW PRESSURE
COOLANT INJECTION THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177-SK-A94



EVENT NO.	20											21		22				23		24		25	26		
RATE OF TEMP. CHANGE-°F/HR SEE NOTE 3	20 / 0	428 / 0	2160 / 0	608 / 0	578 / 0	2160 / 0	651 / 0	180 / 0	105 / 0	STEP 32 / 0	0	918 / 0	180	180 / 0	180 / 0	STEP 32 / 0	0	2782 / 0	360 / 0	STEP 0 / 0	STEP 0 / 0	0	0	0	0
REACTOR PRESSURE-PSIG SEE NOTE 4&5	1050 / 1180 / 1125	1125 / 833	833 / 1180	1180 / 1125	1125 / 607	607 / 1180	1180 / 1125	1125 / 579	579 / 233	233 / 1050	1050	1050 / 170	170 / 0	1050 / 1350 / 938	938 / 240	240 / 1050	1050	1050 / 170	170 / 35	1050	1050	1050	1050	1050	1050
DURATION OF FINAL TEMP.-HR	0	0	0.247	0	0	0.297	INDEF	0	1	0	INDEF	0	INDEF	0	1	0	INDEF	0	INDEF	0.007	INDEF	INDEF	INDEF	INDEF	INDEF
AVERAGE VELOCITY FT/SEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NUMBER OF CYCLES	10	10	10	10	10	10	10	10	10	10	10	8	8	1	1	1	1	1	1	1	1	1	1	1	1



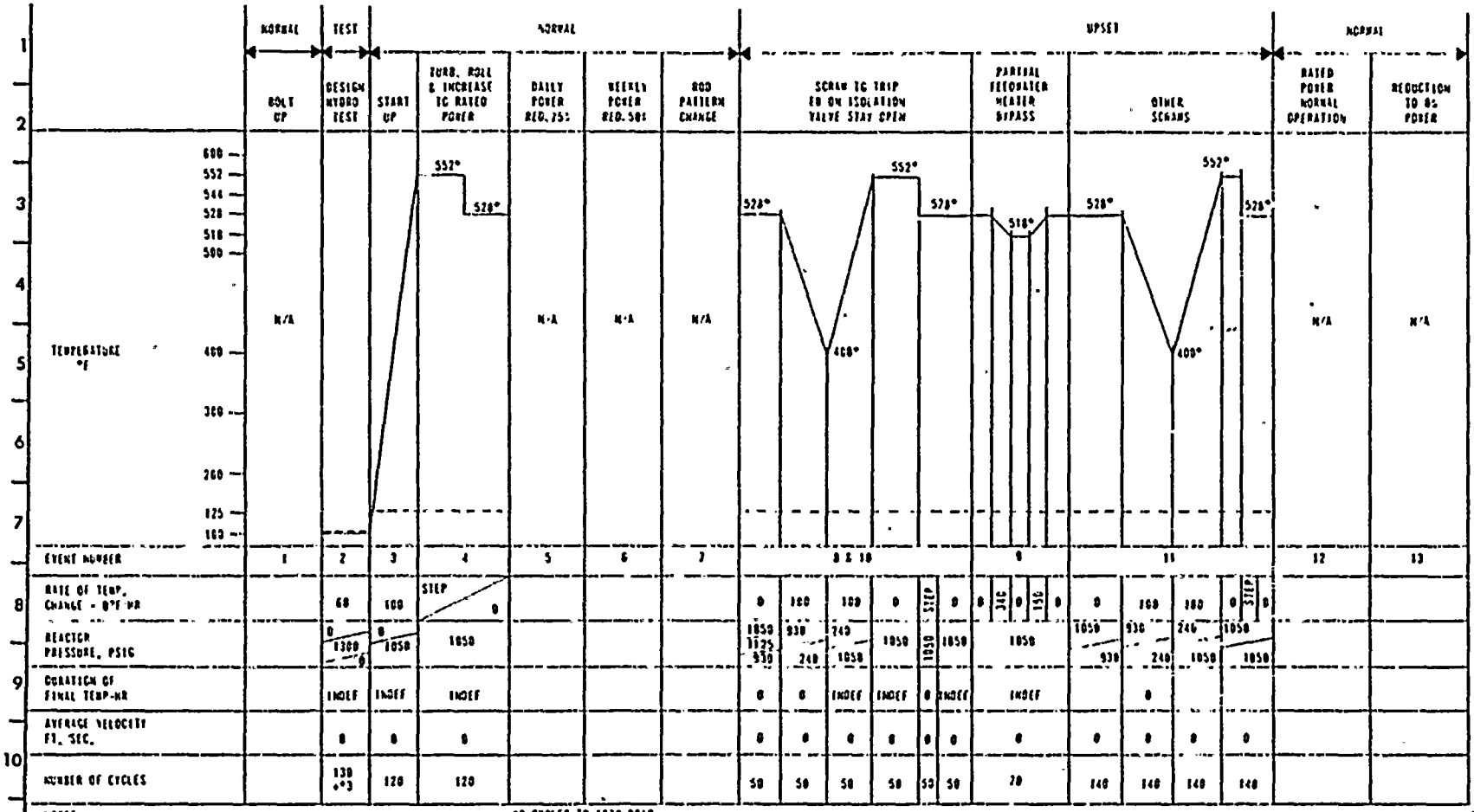
EVENT NO.	27			27A	28		
RATE OF TEMP. CHANGE-°F/HR (SEE NOTE 3)	3469 / 0	STEP 0 / STEP 0	STEP 0 / STEP 0	STEP 0 / STEP 0	100	0 STEP 32 / 0	0
REACTOR PRESSURE-PSIG (SEE NOTE 4&5)	1050	1050 / 300	300 / 35	35	<500	35 / 1050	1050	1050
DURATION OF FINAL TEMP.-HR	0	0.025	INDEF	INDEF	1 HR	0	0
AVERAGE VELOCITY FT/SEC	26.5	26.5	26.5	26.5	0	0	0
NUMBER OF CYCLES	1	1	1	10	3	3	3

RESIDUAL HEAT REMOVAL LOW PRESSURE
COOLANT INJECTION THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION

7-1-80

12177-SK-A94

A 96400



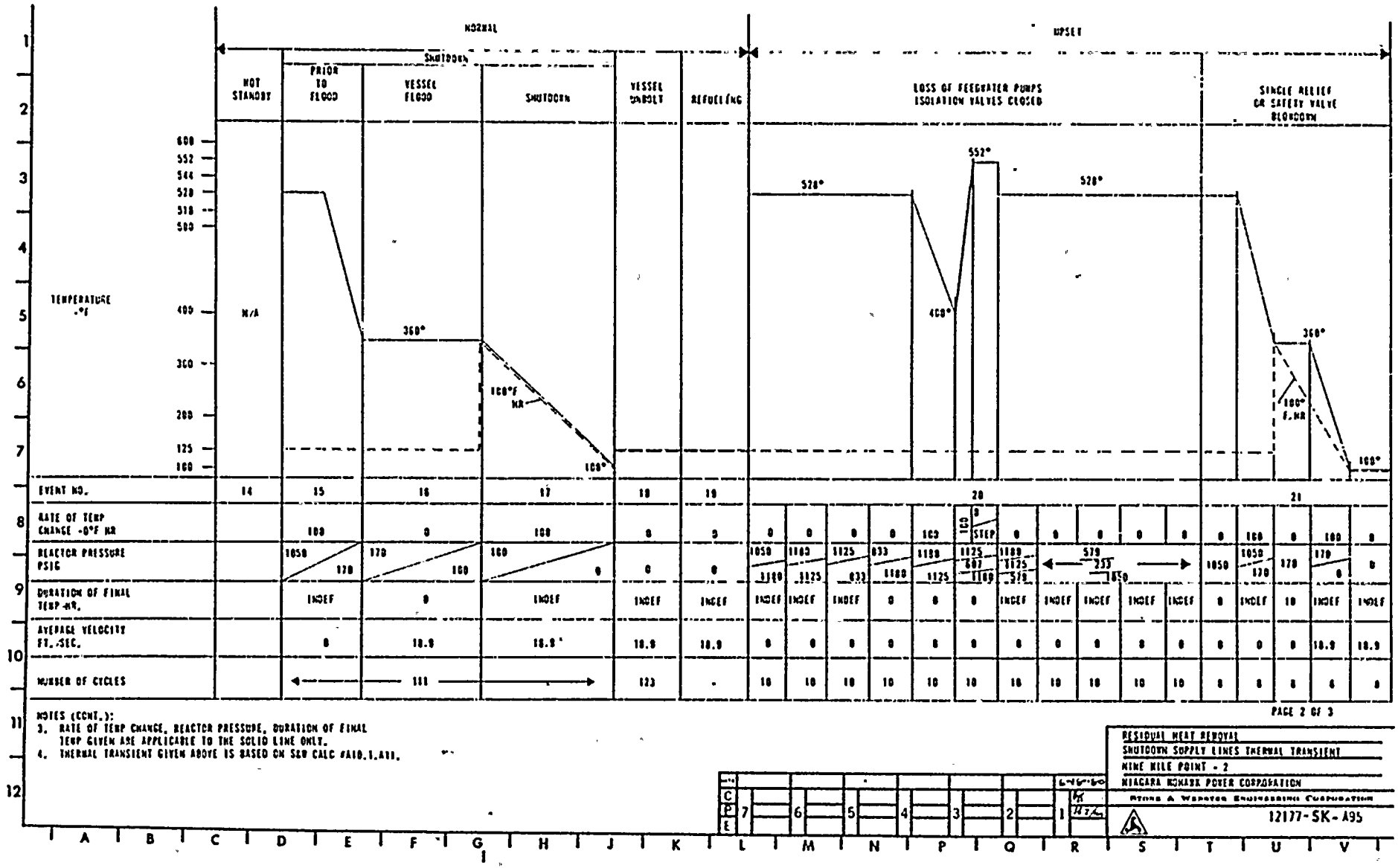
NOTES:

1. SOLID LINE REPRESENTS THE TRANSIENT OF RHR PIPING WHICH IS CONNECTED TO THE RECIRC. PIPING: 2-RHS-020-63-1, 2-RHS-020-159-1 AND 2-RHS*MOV31.
2. DOTTED LINE REPRESENTS THE TRANSIENT FOR THE LINES 2-RHS-020-184-1, 2RHS*MOV112, 2RHS*MOV113 AND PENETRATION Z11. (NOTES - CONT ON SHEET 2)

RESIDUAL HEAT REMOVAL
SHUTDOWN SUPPLY LINES THERMAL TRANSIENT
NINE MILE POINT - 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION

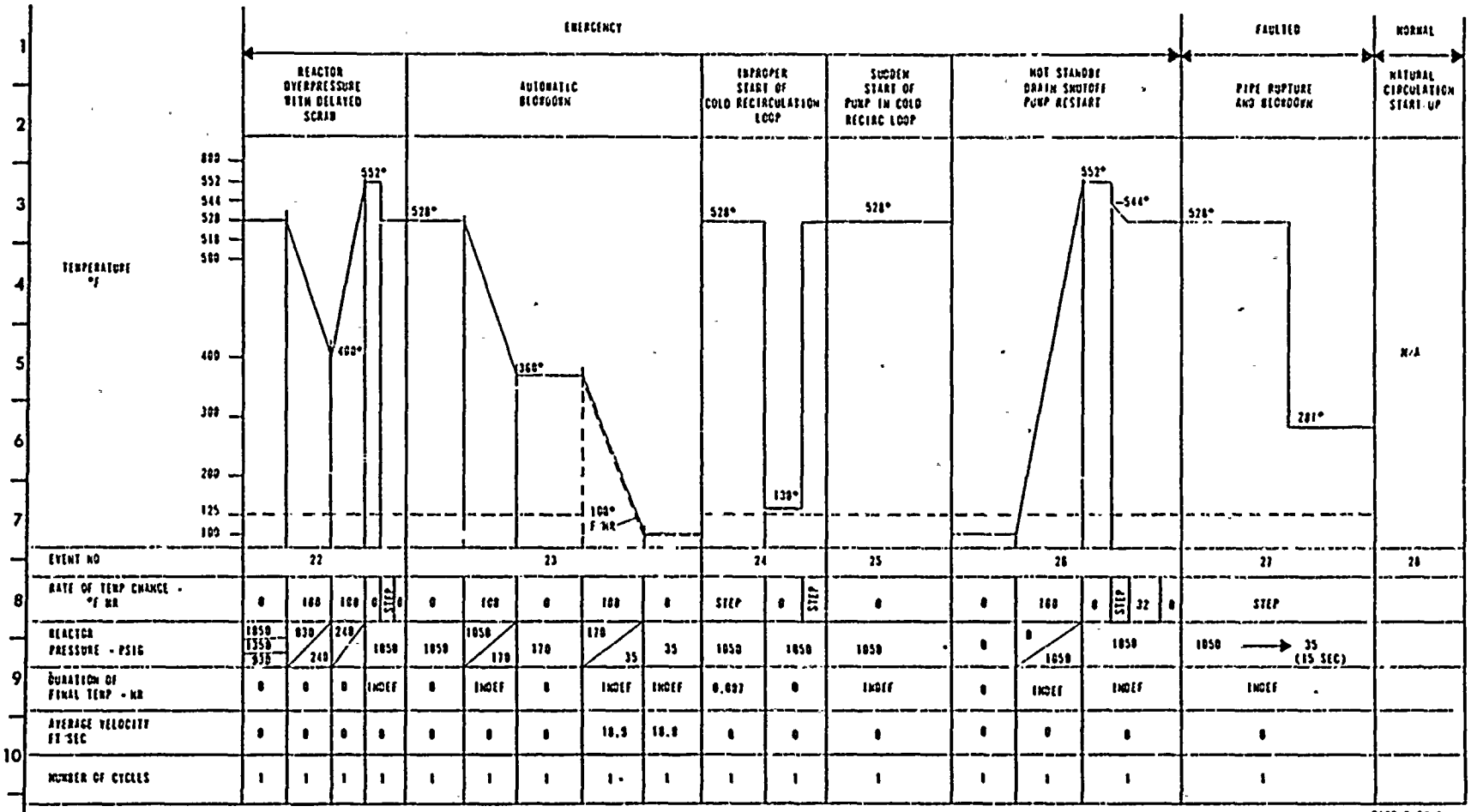
12177-SK-A95

A 94403



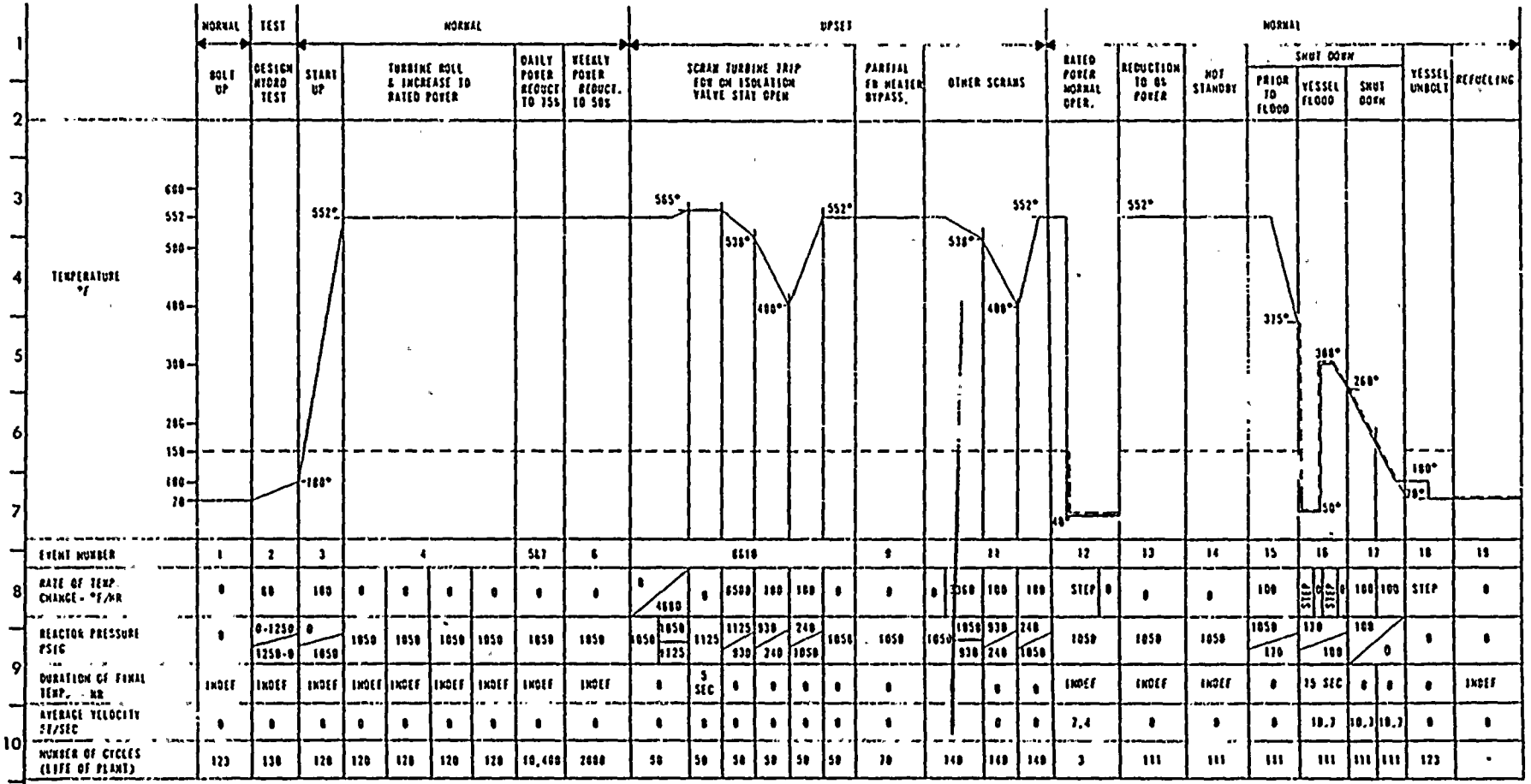
NOTES (CONT.):
3. RATE OF TEMP CHANGE, REACTOR PRESSURE, DURATION OF FINAL TEMP GIVEN ARE APPLICABLE TO THE SOLID LINE ONLY.
4. THERMAL TRANSIENT GIVEN ABOVE IS BASED ON SEW CALC #A10.1.A11.

RESIDUAL HEAT REMOVAL
SHUTDOWN SUPPLY LINES THERMAL TRANSIENT
NINE MILE POINT - 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177-SK-A95



PAGE 3 OF 3

RESIDUAL HEAT REMOVAL
SHUTDOWN SUPPLY LINES THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation
12177-SK-A95

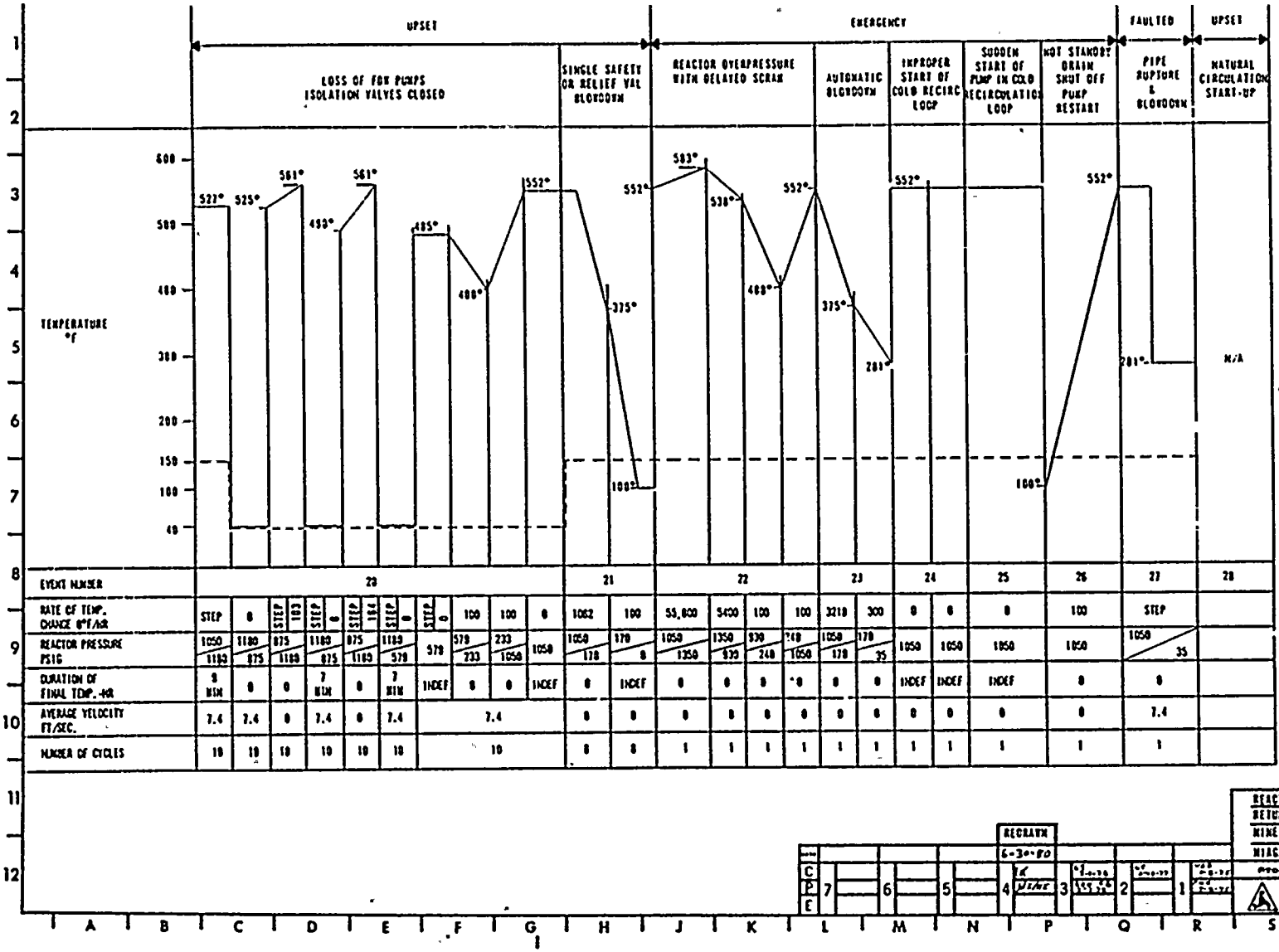


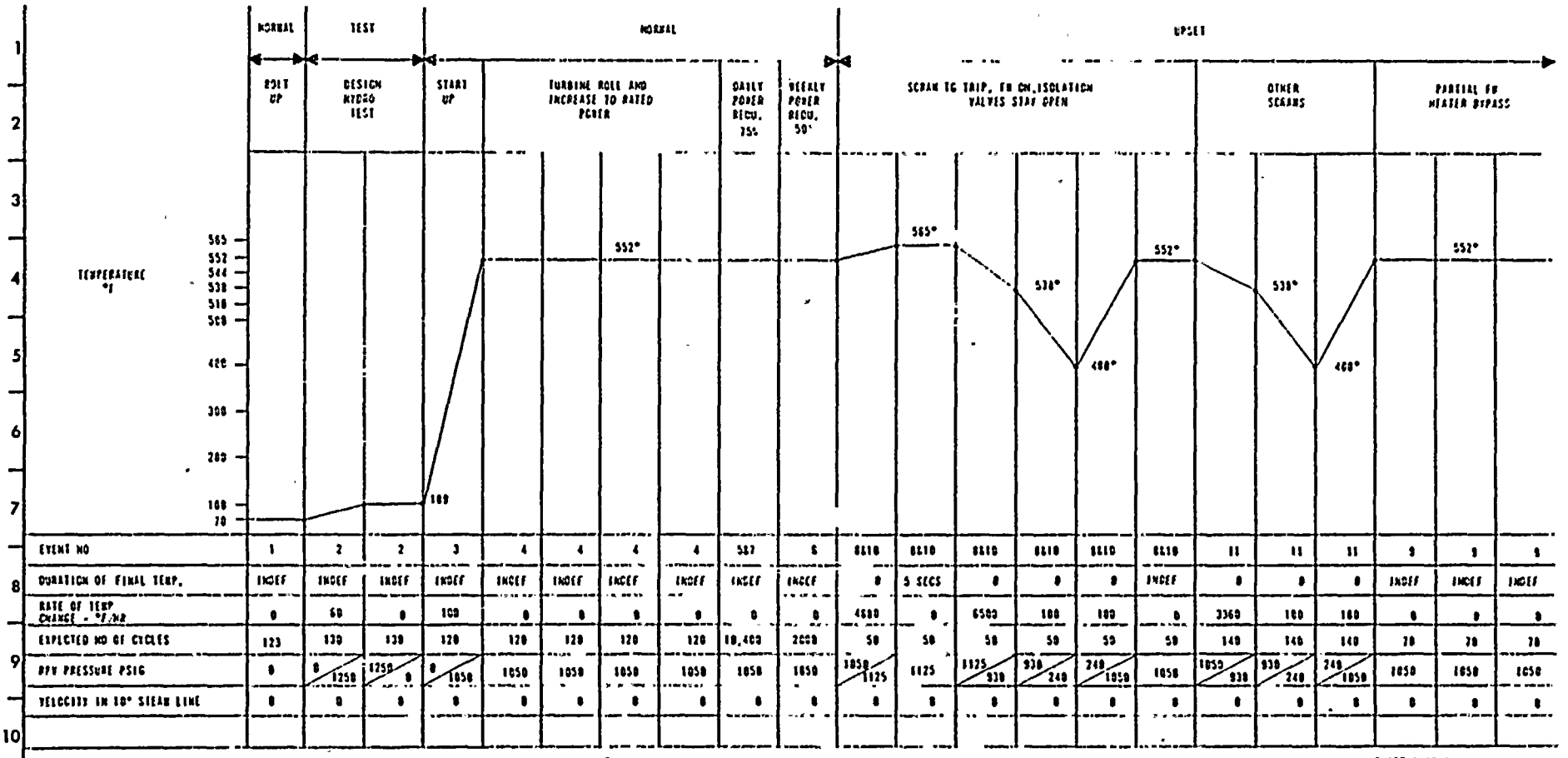
NOTES:
1. SOLID LINE REPRESENTS TRANSIENT OF THE LINE 2-ICS-006-33-1 AND 21CS*AOV153.
2. DASHED LINE REPRESENTS TRANSIENT OF LINES 2-ICS-006-67-1, 2-ICS-006-68-1, 2-RMS-006-142-1, 21CS*AOV156, 21CS*MOV128, 2RMS*V143, 2RMS*MOV104 AND PENETRATION 222.
3. THIS HISTOGRAM IS BASED ON SLW CALC NO. A10.1-A11.

PAGE 1 OF 2

REACTOR CORE ISOLATION COOLING
RETURN THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A96


UPSET
EMERGENCY
FAULTED
UPSET
LOSS OF FDW PUMPS ISOLATION VALVES CLOSED
SINGLE SAFETY OR RELIEF VAL BLOWDOWN
REACTOR OVERPRESSURE WITH DELAYED SCRAM
AUTOMATIC BLOWDOWN
IMPROPER START OF COLD RECIRC LOOP
SUDDEN START OF PUMP IN COLD RECIRCULATION LOOP
HOT STANDBY DRAIN SHUT OFF PUMP RESTART
PIPE RUPTURE & BLOWDOWN
NATURAL CIRCULATION START-UP
TEMPERATURE °F
800
500
400
300
200
150
100
50
527°
525°
561°
493°
561°
485°
400°
552°
552°
375°
100°
553°
538°
488°
552°
375°
281°
552°
552°
281°
N/A
EVENT NUMBER
20
21
22
23
24
25
26
27
28
RATE OF TEMP. CHANGE °F/HR
STEP
0
STEP 183
STEP 0
STEP 184
STEP 0
STEP 0
100
100
0
1062
100
55,800
5400
100
100
3219
300
0
0
0
100
STEP
REACTOR PRESSURE PSIG
1050 / 1183
1180 / 875
875 / 1180
1180 / 875
875 / 1183
1183 / 579
579
579 / 233
233 / 1050
1050
1050 / 178
178 / 0
1050 / 1350
1350 / 930
930 / 248
248 / 1050
1050 / 178
178 / 35
1050
1050
1050
1050
1050 / 35
DURATION OF FINAL TEMP.-HR
9 MIN
0
0
7 MIN
0
7 MIN
INDEF
0
0
INDEF
0
INDEF
0
0
0
0
0
0
INDEF
INDEF
INDEF
0
0
AVERAGE VELOCITY FT/SEC.
7.4
7.4
0
7.4
0
7.4
7.4
0
0
0
0
0
0
0
0
0
0
0
0
0
7.4
NUMBER OF CYCLES
10
10
10
10
10
10
10
8
8
1
1
1
1
1
1
1
1
1
1
1
REORAVN
6-30-80
PAGE 2 OF 2
REACTOR CORE ISOLATION COOLING
RETURN THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177-SK-A96



EVENT NO	1	2	2	3	4	4	4	4	587	5	6&10	6&10	6&10	6&10	6&10	6&10	11	11	11	9	9	9
DURATION OF FINAL TEMP.	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	0	5 SECS	0	0	0	INDEF	0	0	0	INDEF	INDEF	INDEF
RATE OF TEMP CHANGE - °F/HR	0	50	0	100	0	0	0	0	0	0	4500	0	6500	100	100	0	3360	100	100	0	0	0
EXPECTED NO OF CYCLES	123	130	130	120	120	120	120	120	10,400	2000	50	50	50	50	50	50	140	140	140	70	70	70
RPV PRESSURE PSIG	0	0 / 1250	1250 / 0	0 / 1050	1050	1050	1050	1050	1050	1050	1050 / 1125	1125	1125 / 930	930 / 240	240 / 1050	1050	1050 / 930	930 / 240	240 / 1050	1050	1050	1050
VELOCITY IN 10" STEAM LINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTES:
(1) TRANSIENT IS APPLICABLE TO THE FOLLOWING:
(a) 21CS-81B 20-1, 21CS-81B-135-1 (b) 21CS*MOV120, 21CS*MOV170, 21CS*MOV121 AND PENETRATION 221A.
(2) THIS HISTOGRAM IS DEVELOPED BASED ON THE FOLLOWING:
SEE CALC #A10.1.A15
(3) VALVES 21CS*MOV120 AND 21CS*MOV121 ARE NORMALLY KEPT OPEN VALVES AND LINES 39 AND 135 ARE FILLED AND PRESSURIZED WITH STEAM.

SHEET 1 OF 3

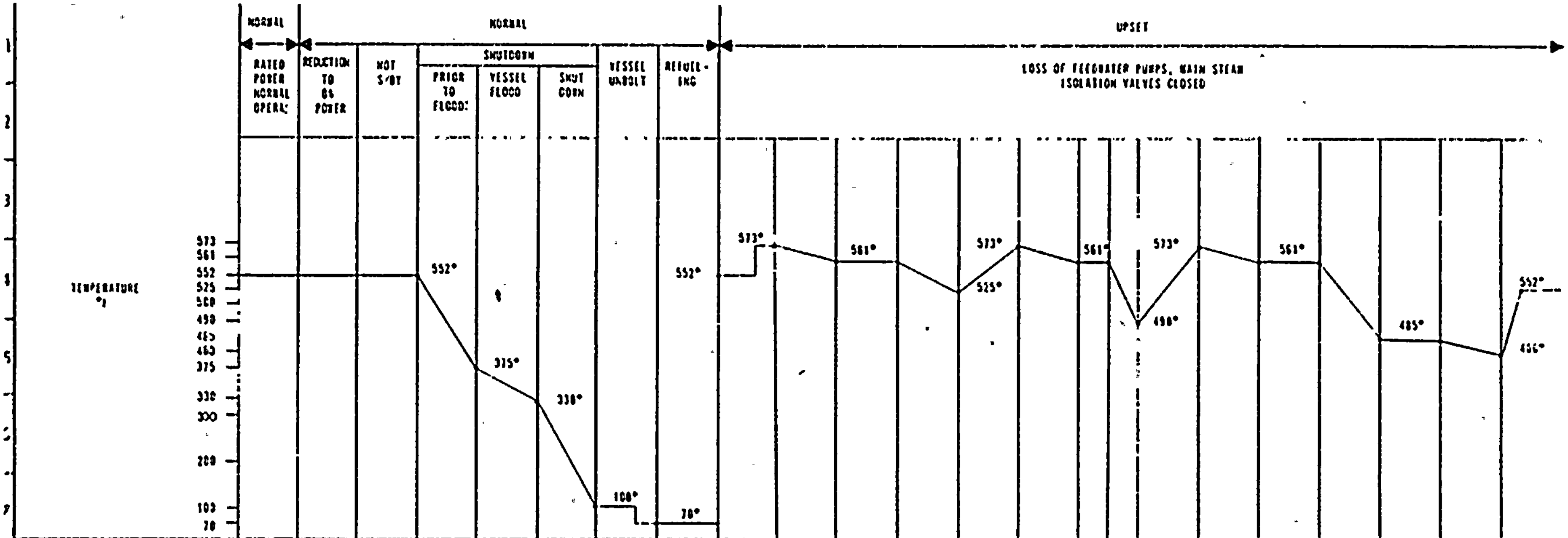
	PD	PMO
	6-13-80	6-18-76
		5-24-76

REACTOR CORE ISOLATION COOLING
STEAM SUPPLY LINE
THERMAL TRANSIENT
NMP2 NMPC

Stone & Webster Engineering Corporation

12177-SK-A103A-1

A 94650



EVENT NO	12	13	14	15	16	17	18	19
DURATION OF TEMP.	INDEF	INDEF	INDEF	0	0	0	INDEF	INDEF
RATE OF TEMP CHANGE °F/HR	0	0	0	100	270	100	STEP	0
EXPECTED NO OF CYCLES	-	111	111	111	111	111	123	-
RPV PRESSURE PSIG	1050	1050	1050	1050 / 170	170 / 100	100 / 0	0	0
VELOCITY IN 19" STEAM LINE (FPS)	0	0	0	0	0	0	0	0

EVENT NO	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
DURATION OF TEMP.	0	0	2 SECS	0	0	0	14.0 MIN.	0	0	0	17.5 MIN	0	INDEF	0	0 / INDEF
RATE OF TEMP CHANGE °F/HR	STEP	4320	0	240	480	4320	0	610	625	4320	0	650	0	100	100
EXPECTED NO OF CYCLES	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
RPV PRESSURE PSIG	1050 / 1100	1100 / 1125	1125	1125 / 875	875 / 1100	1100 / 1125	1125	1125 / 687	687 / 1100	1100 / 1125	1125	1125 / 579	579	579 / 233	233 / 1050
VELOCITY IN 19" STEAM LINE (FPS)	0	51.6	51.6	51.6	51.8	51.6	51.6		51.6	51.6	0	0	0	0	0

REACTOR CORE ISOLATION COOLING
STEAM SUPPLY LINE
THERMAL TRANSIENT
WNP2 WNPC

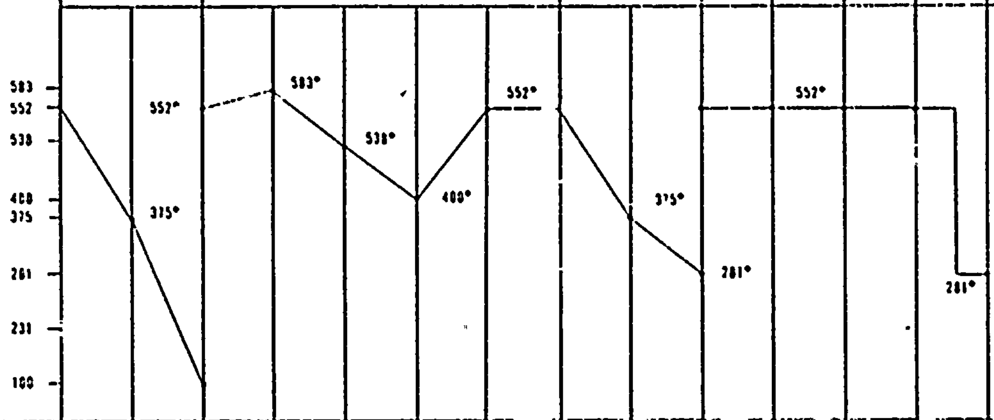
Stone & Webster Engineering Corporation

12177-SK-A1038-1

6-13-80

	UPSET		EMERGENCY										FAULTED	UPSET
	SINGLE RELIEF OR SAFETY VALVE BLOWDOWN		REACTOR OVERPRESSURE WITH DELAYED SCRAM					AUTOMATIC BLOW DOWN		IMPROPER START OF COLD RECIRC LOOP	SUDDEN START OF PUMP IN COLD RECIRC LOOP	HOT S/BY DRAIN SHUTOFF PUMP RESTART	PIPE RUPTURE AND BLOW DOWN	NATURAL CIRCULATION START-UP

TEMPERATURE °F

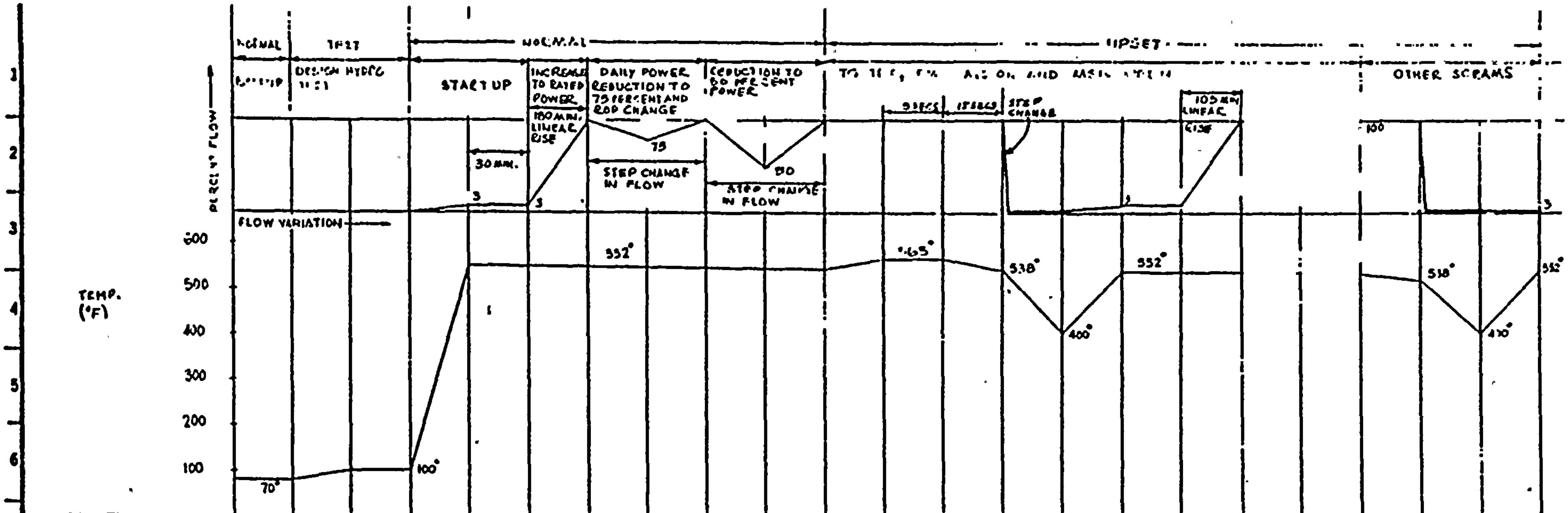


EVENT NO	21	21	22	22	22	22	22	23	23	24	25	26	27	28
DURATION OF TEMP.	0	0	0	0	0	0	INDEF	0	~0	INDEF	INDEF	INDEF	INDEF	
RATE OF TEMP CHANGE °F/HR	1062	130	55,000	5400	180	180	0	3218	300	0	0	0	STEP	
EXPECTED NO. OF CYCLES	8	8	1	1	1	1	1	1	1	1	1	1	1	
RPV PRESSURE PSIG	1050 / 170	170 / 0	1050 / 1350	1350 / 930	930 / 240	240 / 1050	1050	1050 / 170	170 / 35	1050	1050	1050	1050 / 35	
VELOCITY IN 10" STEAM LINE FPS	0	0	0	0	0	0	0	0	0	0	0	0	51.6	

SHEET 3 OF 3

REACTOR CORE ISOLATION COOLING
STEAM SUPPLY LINE
THERMAL TRANSIENT
NMP2 NMPC
Stone & Webster Engineering Corporation
12177-SK-A 103C-3

6-13-80



EVENT NO	1	2	2	3	3	4	5&7	5&7	6	6	8&10	8&10	8&10	8&10	8&10	8&10	8&10			11	11	11
DURATION OF FINAL TEMP	INDEFINITE	—	INDEFINITE	—	INDEFINITE	INDEFINITE	—	INDEFINITE		INDEFINITE	—	5 SECS	—	—	—	INDEFINITE →				—	—	—
RATE OF TEMP CHANGE °F/H	—	60	—	100	—	—	—	—	—	—	4680	—	6500	100	100	—	—			3360	100	100
EXPECTED NO OF CYCLES	123	130	130	120	120	120	10,400	10,400	2000	2000	50	50	50	50	50	50	50			140	140	140
PERCENT OF VWO STEAM FLOW	0	0	[illegible]	0 / 3	3	3 / 100	100 / 75	75 / 100	100 / 50	50 / 100	100	100	100	100 / 3	0 / 3	3	3 / 100			100 / 0	0	0 / 3
RPV PRESSURE (PSIG)	0	0 / 1250	1250 / 0	0 / 1050	1050	1050	1050	1050	10 0	10 0	1050 / 1125	1125	1125 / 930	930 / 240	240 / 1050	1050	1050			1050 / 930	930 / 240	240 / 10 0
VELOCITY IN 26" LINE FROM RPV TO SRV INLET (FT/S)	0	0	0	0 / 5	5	5 / 145	145 / 109	109 / 145	145 / 73	73 / 145	145 / 138	138	138 / 165	165 / 20	20 / 5	5	5 / 145			145	145 / 20	20 / 5
VELOCITY IN 26" LINE FROM SRV INLET TO 2ND MSIV (FT/S)	0	0	0	"	"	"	"	"	"	"	"	145 / 32	32 / 38	38 / 20	"	"	"			"	"	"

GENERAL: THIS HISTOGRAM IS DEVELOPED BASED ON THE FOLLOWINGS:

1. FOR [illegible] AND TEMP TRANSIENTS - NUCLEAR BOILER SYSTEM DESIGN SPECIFICATION [illegible] DOCUMENT NO 22A2887 REV 6 AND REACTOR VESSEL THERMAL CYCLES [illegible] NO [illegible] REV 2
2. FOR [illegible] REACTOR VESSEL NOZZLE THERMAL CYCLE [illegible] 2-3-76 AND S&W [illegible] NO AIO-1Ø-2 AND AIO-1Ø-3
3. VELOCITY OF MAIN STEAM FROM RPV TO SRV INLET AND FROM SRV INLET TO 2ND MSIV IS SAME UNLESS OTHERWISE SHOWN.

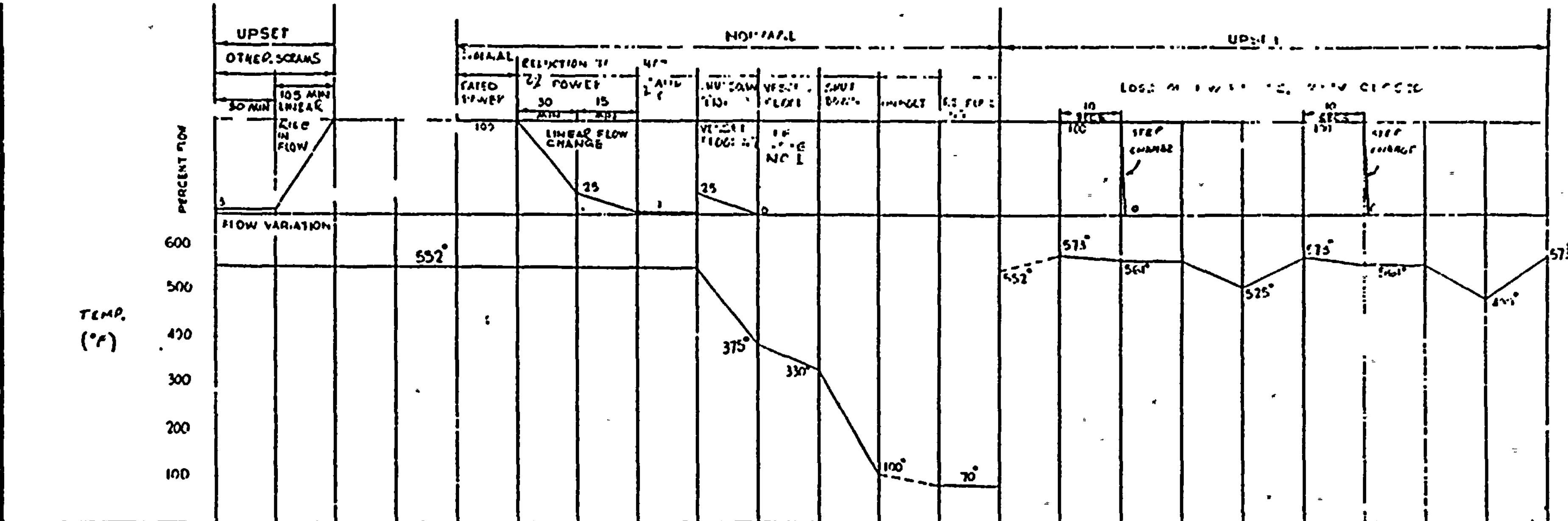
C	7	6	5	4	3	2	1	1-11-80
P								[illegible]
E								[illegible]

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT UNIT 2
NIAGARA MOHAWK POWER CORPORATION

STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A104
SHEET 1 OF 4

Original kept by Power Design.



EVENT NO	11	11			12	13	13	14	15	16	17	18	19	20	20	20	20	20	20	20	20	20
DURATION OF FINAL TEMP	INDEFINITE	→			INDEFINITE	INDEFINITE	→	INDEFINITE	—	—	—	INDEFINITE	INDEFINITE	—	—	2 SECS	—	—	—	14.8 MINUTES	—	—
RATE OF TEMP CHANGE °F/H	—	—			—	—	—	—	100	270	1?0	STEP	—	STEP	4320	—	240	480	4320	—	610	625
EXPECTED NO OF CYCLES	140	140			—	111	111	111	111	111	111	123	—	10	10	10	10	10	10	10	10	10
PERCENT OF VWO STEAM FLOW	3	3 / 100		----	100	100 / 25	25 / 1	1	25 / 0	0	0	0	0	100	100	0	0	0	100	100 / 0	0	0
RPV PRESSURE	1050	1050			1050	1050	1050	1050	1050 / 170	170 / 100	100 / 0	0	0	1050 / 1180	1180 / 1125	1125	1125 / 875	875 / 1180	1180 / 1125	1125	1125 / 627	627 / 1180
VELOCITY IN 26" STEAM LINE FROM RPV TO SRV INLET	5	5 / 145		—	145	145 / 32	32 / ?	2	32 / 0	0	0	0	0	145 / 130	130	130 / 0	0	0	130	130 / 0	0	0
VELOCITY IN 26" STEAM LINE FROM SRV INLET TO 2ND MSIV	"	"			"	"	"	"	"	-	"	"	"	145 / 0	0	0	0	0	0	0	0	0

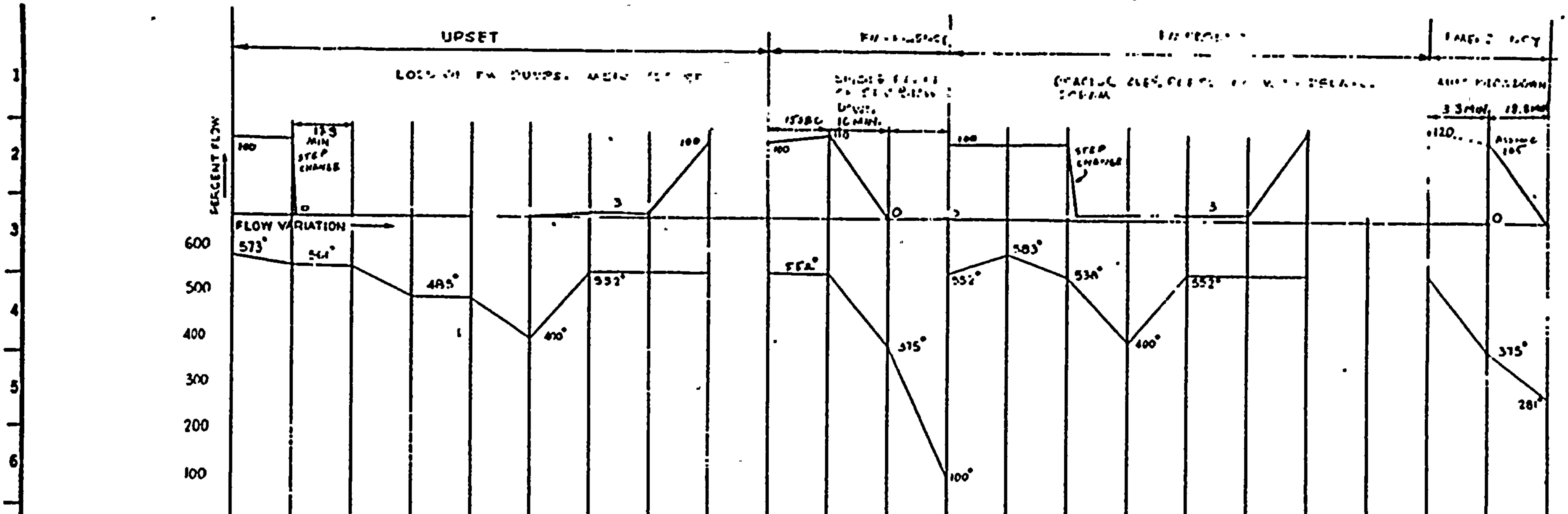
NOTE 1 DURING THIS PERIOD, WATER FLOWS INTO THE MAIN STEAM PIPE VELOCITY ASSUMED ZERO

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.

STONE & WEBSTER ENGINEERING CORPORATION

1-11-80

12177-SK-A104
SHEET 2 OF 4



EVENT NO	20	20	20	20	20	20	20	20	21	21	21	22	22	22	22	22	22	23	23
DURATION OF FINAL TEMP	—	17-8 MINUTES	—	INDEFINITE	—	—	INDEFINITE →		—	—	—	—	—	—	INDEFINITE →			—	—
RATE OF TEMP CHANGE °F/H	4320	—	650	—	100	100	—	—	0	1062	100	55800	5400	100	100	—	—	32'8	300
EXPECTED NO OF CYCLES	10	10	10	10	10	10	10	10	8	8	8	1	1	1	1	1	1	1	1
PERCENT OF REACTOR RATED FLOW	100	100 / 0	0	0	0	0 / 3	3	3 / 100	100 / 110	110 / 0	0	100	100 / 0	0	0 / 3	3	3 / 100	120 / 0	0
RPV PRESSURE	1180 / 1125	1125	1125 / 579	579	579 / 233	233 / 1050	1050	1050	1050	1050 / 170	170 / 0	1050 / 1350	1350 / 930	930 / 240	240 / 1050	1050	1050	1657 / 110	170 / 35
VELOCITY IN STEAM LINE FROM RPV TO REL VLV INLET-26"φ	130	130 / 0	0	0	0	0 / 5	5	5 / 145	145 / 159	159 / 0	0	145 / 108	108 / 165	165 / 20	20 / 5	5	5 / 145	1179 / 203	203 / 0
VELOCITY IN STEAM LINE FROM REL VLV INLET TO 2ND MSIV	0	0	0	0	0	0 / 5	5	5 / 145	145 / 150	150 / 0	0	145 / 108	108 / 5	5 / 20	20 / 5	5	5 / 145	113 / 560	560 / 0

MAIN STEAM THERMAL TRANSIENT

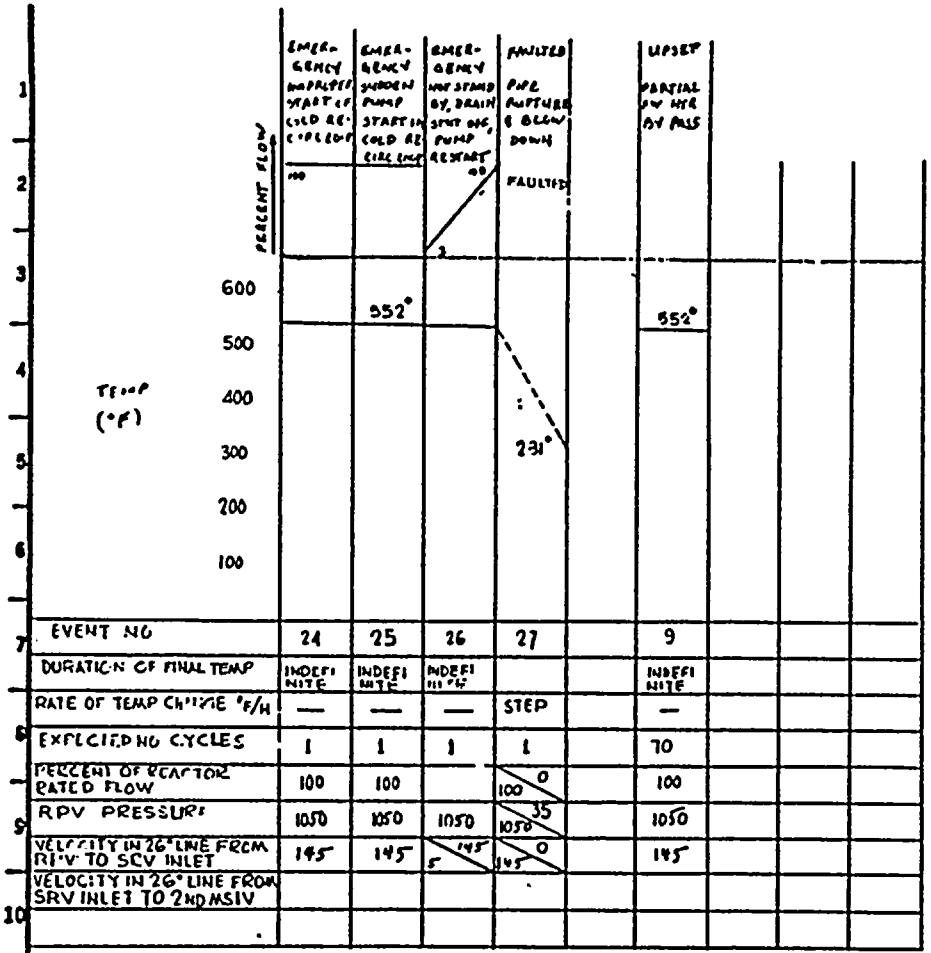
NIAGARA MOHAWK, POWER CORP

1-11-80

STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A104

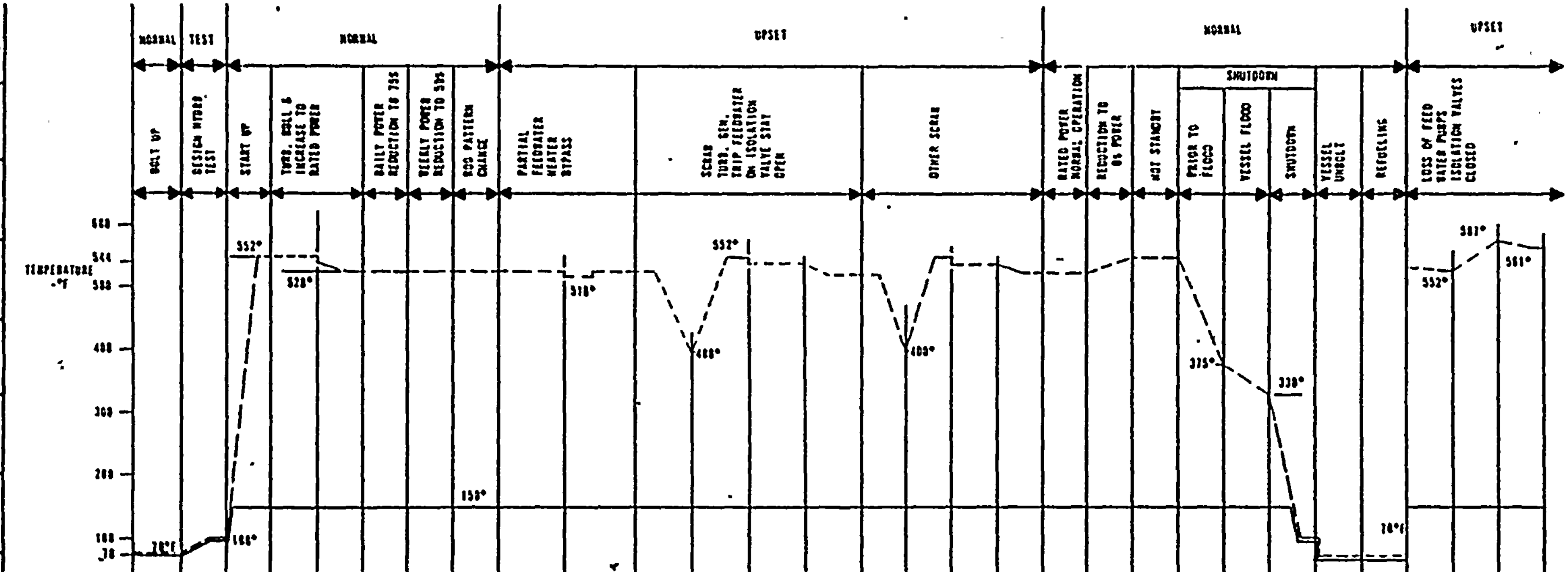
SHEET 3 OF 4



MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.

STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A104
SHEET 4 OF 4



EVENT NO.	1	2	3	4		5	6	7	8		9 & 10				11				12	13	14	15	16	17	18	19	20		
RATE OF TEMPERATURE CHANGE-°F HR	0	60 / 50	100 / 100	STEP / 0	32 / 0	0	0	0	STEP 0 / 0	STEP 0 / 0	100 / 0	100 0 / 0	STEP / 0	32 / 0	100 / 0	100 0 / 0	STEP / 0	32 / 0	0	32 / 0	0	100 / 0	270 / 0	100 / 100	STEP / STEP	0	10 / 0	420 / 0	2100 / 0
REACTOR PRESSURE PSIG	0	0 / 1250 / 0	0 / 1050	1050	1050	1050	1050	1050	1050	1050	1050 930 / 930 240	240 / 1050	1050	1050	1050 930 / 930 240	240 / 1050	1050	1050	1050	1050	1050	1050 / 170	170 / 100	100 / 0	0	0	[illegible]	833 / 1100	1100 / 1125
DURATION OF FINAL TEMP-HR	INDEF	INDEF	INDEF	0	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	0	1	0	INDEF	0	1	0	INDEF	INDEF	INDEF	INDEF	0	0	INDEF	INDEF	INDEF	0	.8	.247
AVERAGE VELOCITY FT/SEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NUMBER OF CYCLES	123	120	120	120	120	10,000	2000	400	70	70	50	50	50	50	140	140	140	140	-	111	111	111	111	111	123	-	10	10	10

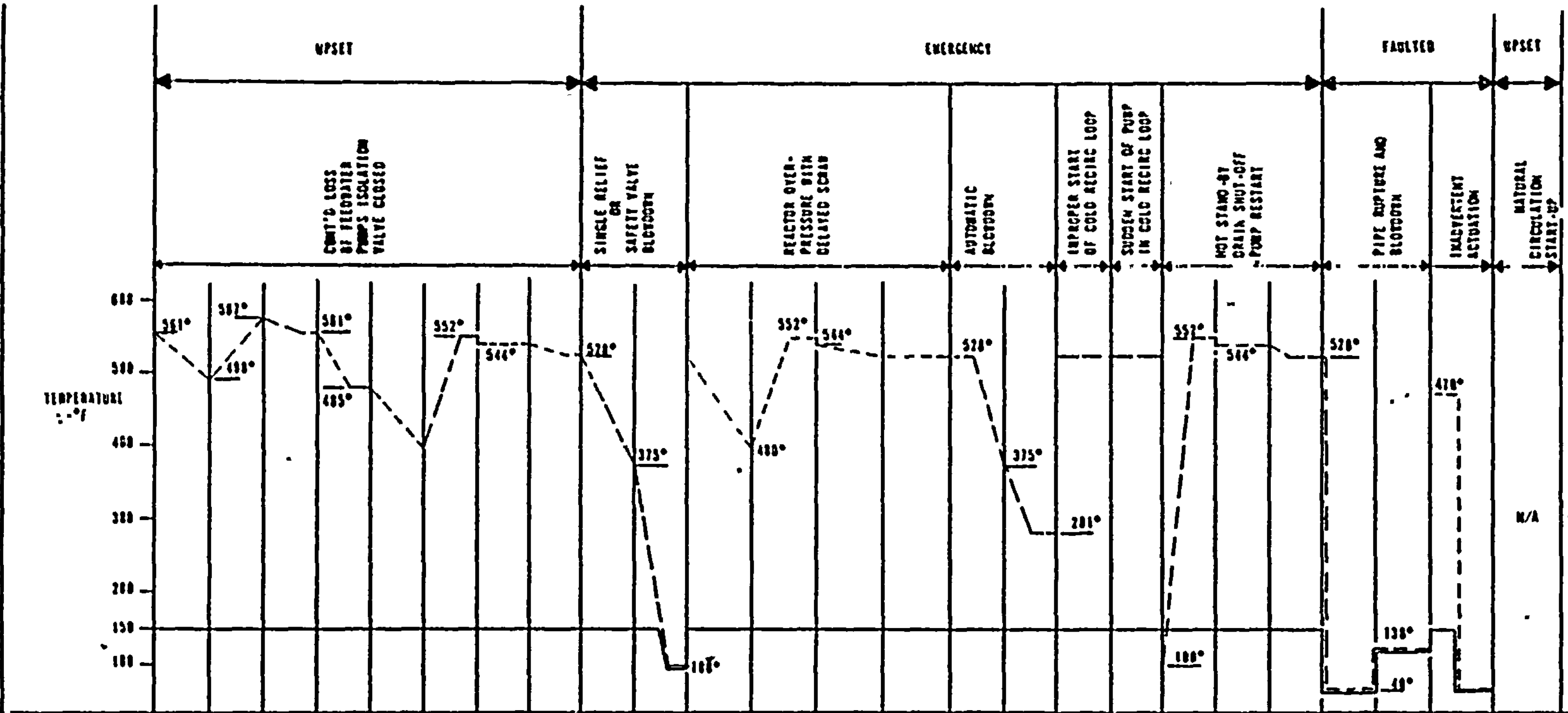
NOTES:
1. DASHED LINE REPRESENT TRANSIENT OF REACTOR NOZZLE 2CSL-010-13-1, 2-CSL-012-4-1, AND UP TO & INCLUDING CHECK VALVE AOV101.
2. SOLID LINE REPRESENT TRANSIENT FROM CHECK VALVE AOV101. 2-CSL-012-4-1, PENETRATION Z-10, 2-CSL-012-17-1 AND UP TO AND INCLUDING GATE VALVE MOV104.
3. IN EVENT WHERE VELOCITY = 0, PRESSURE AS SHOWN IS APPLICABLE FROM REACTOR NOZZLE TO AOV101 FROM AOV101 TO MOV104.
(NOTES-CONTD ON SHEET 2)

SHEET 1 OF 2

LOW PRESSURE CORE SPRAY
TRANSIENT
NINE MILE POINT NUCLEAR STATION 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation

12177-SK-A105

						P.O.	EMO	
					6-23-80	10-7-76	6/11/76	
C P E	7	6	5	4	3	2	1	



EVENT NO	20								21		22				23		24	25	26			27		27A	28
RATE OF TEMPERATURE CHANGE-°F/HR	800 / 0	570 / 0	2150 / 0	851 / 0	100 / 0	100 0 / 0	STEP / 0	32 / 0	810 / 0	160 / 100	100 / 0	1000 / 0	STEP	32 / 0	0	2702 / 0	380 / 0	0	0	100 0 / 0	STEP 0 / 0	32 0 / 0	STEP 0 / STEP 0	STEP 0 / STEP 0	STEP 0 / STEP 0	
REACTOR - PRESSURE PSIG	1125 / 887	887 / 1100	1100 / 1125	1125 / 570	570 / 233	233 / 1050	1050	1050	1050 / 170	170 / 0	[illegible] / 950 / 240	240 / 1050	1050	1050	1050 / 170	170 / 35	1050	1050	1050	1050	1050	1050 / 35	35	<500	
DURATION OF FINAL TEMP.-HR	0	0	.207	INDEF	0	1	0	INDEF	0	INDEF	0	1	0	INDEF	0	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	0.025	INDEF	INDEF	
AVERAGE VELOCITY FT/SEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*	
NUMBER OF CYCLES	10	10	10	10	10	10	10	10	8	8	1	1	1	1	1	1	1	1	1	1	1	1	1	10	

NOTES (CONT.):

4. PRESSURE IS EQUAL TO ZERO IN ANY EVENT WHERE VELOCITY >0. PRESSURE AS SHOWN IS APPLICABLE FROM REACTOR NOZZLE TO MOV104.
5. THERMAL TRANSIENT GIVEN IS BASED ON: S&W CALC NO. A10.1.A11.
6. IN THE RATE OF CHANGE LINE, UPPER & LOWER VALUES REPRESENT THE RATE OF DASHED LINE & SOLID LINE RESPECTIVELY.

* VELOCITY OF 2-CSL-012-4-1 & 2-CSL-012-17-1 = 24.0 FT/SEC
VELOCITY OF 2-CSL-010-13-1 = 34.0 FT/SEC

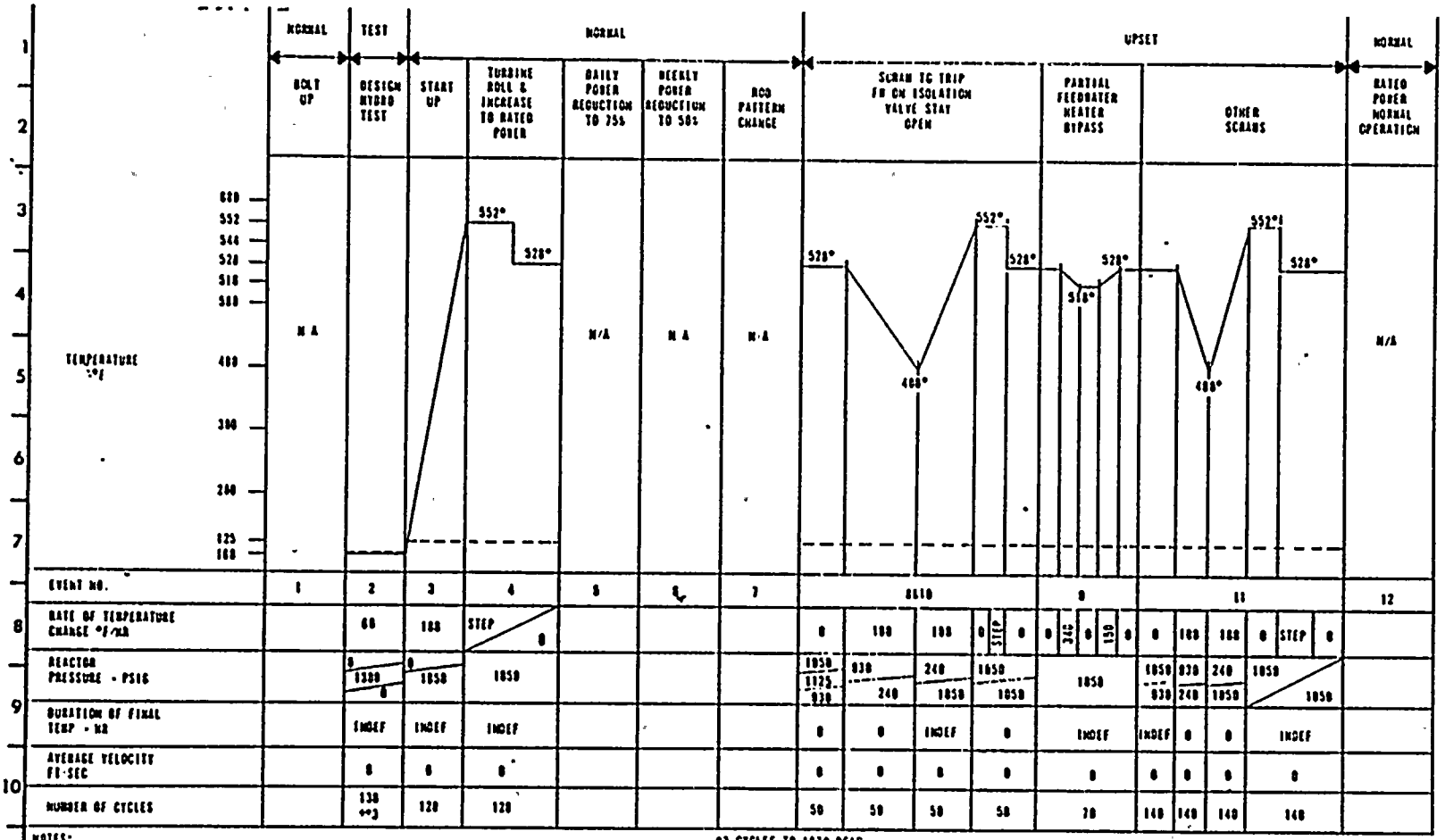
SHEET 2 OF 2

LOW PRESSURE CORE SPRAY
TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A105

6-23-80

A 9900.0

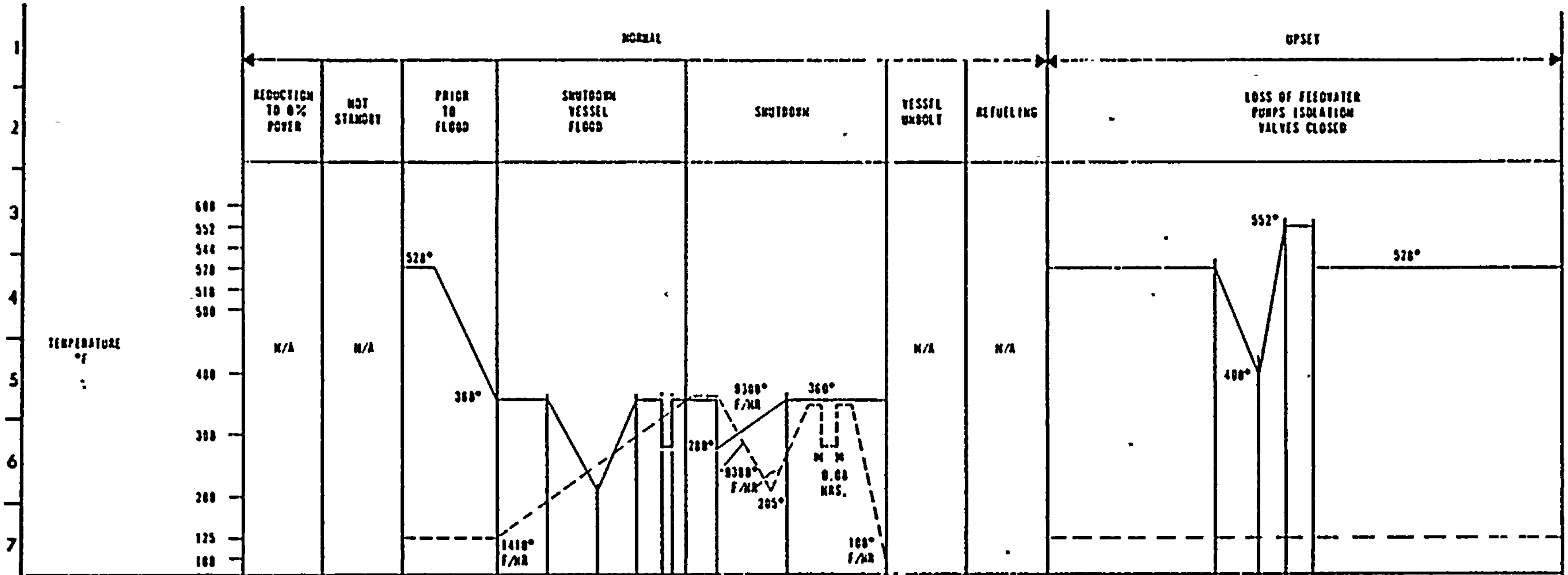


*3 CYCLES TO 1070 PSIG

NOTES:
1. SOLID LINE REPRESENTS THE TRANSIENT OF RHR PIPING WHICH IS CONNECTED TO THE RECIRC PIPING, 2-RHS-012-183-1, 2-RHS-012-288-1, 2-RHS-012-30-1, 2-RHS-012-10-1, 2RHS*MOV54A AND 2RHS*MOV54B.
2. DOTTED LINE REPRESENTS THE TRANSIENT FOR LINES: 2-RHS-012-110-1, 2-RHS 012-210-1, 2RHS*AOV38A, 2RHS*AOV38B, 2RHS*MOV67A, 2RHS*MOV67B, 2RHS*MOV48A, 2RHS*MOV48B, PENETRATIONS 218A AND 218B.

(NOTES CONT ON PAGE 2)

RESIDUAL HEAT REMOVAL SHUTDOWN
RETURN LINES THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation
12177-SK-A107



EVENT NUMBER -	13	14	15	16	17	18	19	20
RATE OF TEMP. CHANGE - 0°F/HR			100	0 / 0300 / 0300 / 0 / STEP / 0 / STEP	STEP / 1000 / 0			0 / 0 / 0 / 0 / 100 / 100 / 0 / STEP 0 / 0 / 0 / 0 / 0
REACTOR PRESSURE, PSIG			1050 / 170	170 / 100	100 / 0			1050 / 1100; 1100 / 1125; 1125 / 833; 833 / 1100; 1100 / 1125; 1125 / 887 / 1100; 2780 / 1125 / 579; ← 579 / 233 / 1050 →
DURATION OF FINAL TEMP-HR.			INDEF	INDEF	INDEF			INDEF / INDEF / INDEF / 0 / 0 / 0 / INDEF / INDEF / INDEF / INDEF / INDEF
AVERAGE VELOCITY FT/SEC.			0	0 / 24.04	24.04			0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0
NUMBER OF CYCLES			← 111 →					10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10

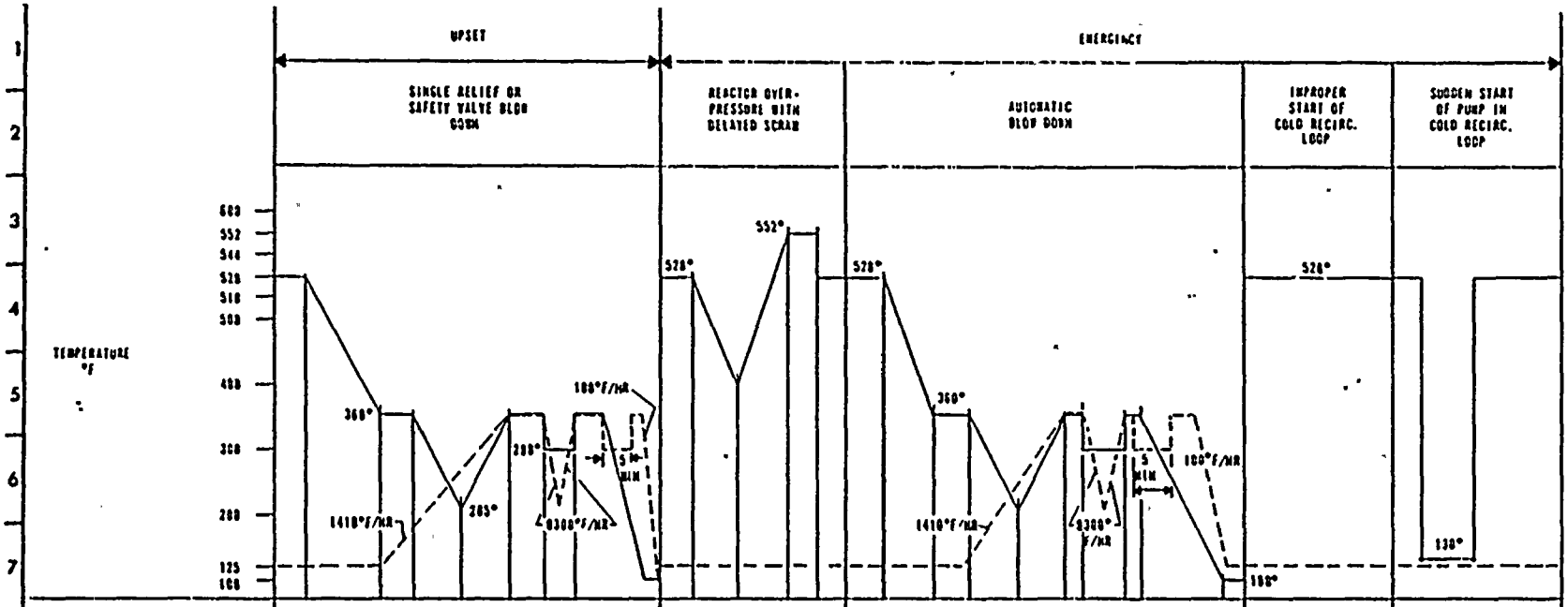
NOTES (CONT.):

3. RATE OF TEMP CHANGE, REACTOR PRESSURE, DURATION OF FINAL TEMP GIVEN ARE APPLICABLE TO THE SOLID LINE ONLY.
4. THERMAL TRANSIENT GIVEN ABOVE IS BASED ON GE SPECS 22A4248 REV 0, 22A2887 REV.5, 22A6224 REV. 1 AND S&W CALCULATIONS.
5. RHR RETURN LINE CONNECTED TO RECIRC PIPING WILL OPERATE AT A MAXIMUM PRESSURE OF 1604 PSIG WHILE REACTOR RECIRCULATION PUMPS ARE RUNNING.

RESIDUAL HEAT REMOVAL SHUTDOWN
RETURN LINES THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation
6-23-80
12177-SK-A107

C E 7 6 5 4 3 2 1

A B C D E F G H J K L M N P Q R S T U V



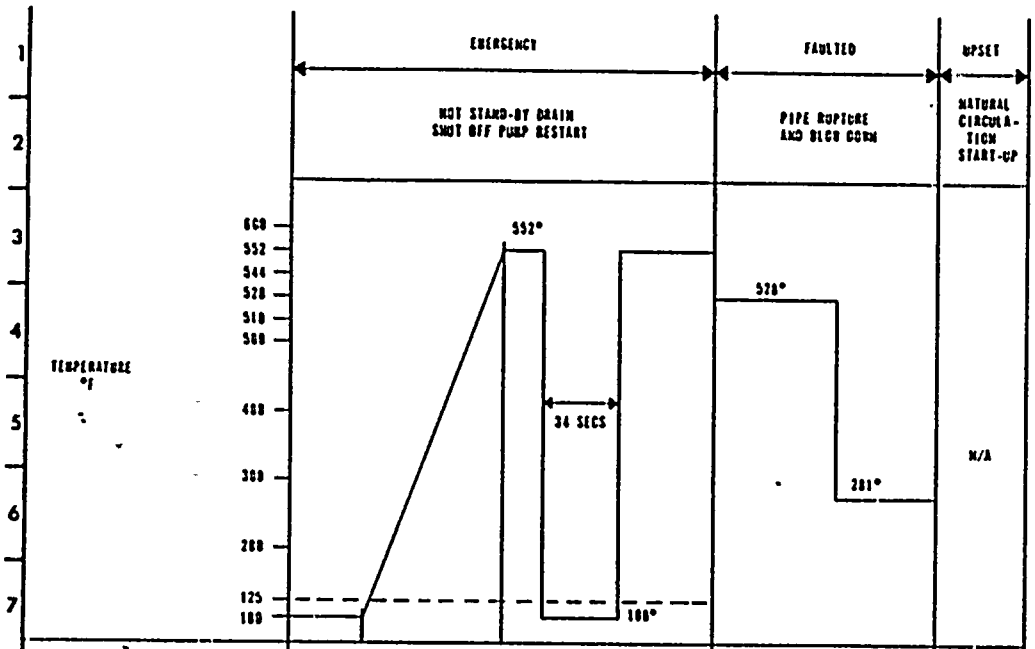
EVENT NUMBER	21	22	23	24	25
RATE OF TEMP CHANGE -°F/HR	0 / 100 / 0 / 9300 / 9300 / 0 / STEP / 0 / STEP / 0 / 100	0 / 100 / 100 / STEP / 0	100 / 0 / 9300 / 9300 / 0 / STEP / 0 / STEP / 0 / 100 / 0	0	STEP / 0 / STEP / 0
REACTOR PRESSURE PSIG	1050 / 1850/170 / 170 / 170 / 170 / 170 / 170 / 170 / 170/0	1050/1350/938 / 938/240 / 240/1050 / 1050	1050/170 / 170/35 / 35 / 35 / 35 / 35 / 35 / 35 / 35	1050	1050 / 1050 / 1050
DURATION OF FINAL TEMP-HR.	0 / INDEF / 0 / 0 / 0 / INDEF / 0.08 / INDEF	0 / 0 / 0 / INDEF	0 / INDEF / 0 / 0 / 0 / INDEF / 0.08 / INDEF / 0 / INDEF	INDEF	0.083 / 0 / INDEF
AVERAGE VELOCITY FT./SEC	0 / 0 / 0 / 0 / 0 / 0 / 24.84	0 / 0 / 0 / 0	0 / 0 / 0 / 0 / 0 / 0 / 0 / 24.84 / 24	0	0 / 0 / 0
NUMBER OF CYCLES	0 / 0 / 0 / 0 / 0 / 0 / 0 / 0	1 / 1 / 1 / 1	1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1	1	1 / 1 / 1

PAGE 3 OF 4

RESIDUAL HEAT REMOVAL SHUTDOWN
RETURN LINES THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation

12177-SK-A107

6-23-80



	EMERGENCY							FAULTED	UPSET
EVENT NUMBER	26							27	28
RATE OF TEMPERATURE CHANGE °F/HR	0	100	0	STEP	0	STEP	0	STEP	
REACTOR PRESSURE - PSIG	0	0 → 1850			1850			1850 → 35	
DURATION OF FINAL TEMP., HR	0	INDEF			INDEF			INDEF	
AVERAGE VELOCITY FT/SEC.	0	0			0			0	
NUMBER OF CYCLES	1	1			1			1	

PAGE 4 OF 4

RESIDUAL HEAT REMOVAL
SHUTDOWN RETURN LINES THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A107

6-23-80

A 00000

J.O.No. 12177
Spec No. NMP2-P304R

Revision: 2
Revised: March 14, 1980

BC8003180010 G628

Specification for

MOTOR-OPERATED CARBON STEEL VALVES

ASME Code, Section III, Classes 1, 2, and 3

Nine Mile Point Nuclear Station - Unit 2
Niagara Mohawk Power Corporation
Scriba, New York

VELAN ENGINEERING COMPANIES

STATE OF NEW YORK
PETER D. VISALLI
No. 050821
LICENSED PROFESSIONAL ENGINEER

APPROVED	Name	Date
Preparer	[illegible]	3-5-80
Lead Engr	[illegible]	3-13-80
Specialist	A. Joyce/ASV	3-13-80
Proj Engr	K. [illegible]	3/14/80
Qual Assur	[illegible]	3/14/80
Mtrls Engg	[illegible]	3/14/80
Const Dept	NA	

This design specification is hereby certified to be correct, complete, and in compliance with the ASME Boiler and Pressure Vessel Code Section III, NA-3250, dated: 7-1-74 and Addenda dated 6-30-74, 12-31-74, 6-30-75, and 12-31-75.

Signed: Peter D. Visalli

Date: 3-13-80

Prof. Eng. State: N.Y.

Registration No: 050821

Independent Reviewer A. Joyce/ASV

Date 3-13-80

I

NUCLEAR SAFETY RELATED

ORGANIZATION

This specification consists of the following:

Section 1 - Information and Requirements

Section 2 - Sketches and Supplementary Information

Section 3 - List of References

Section 4 - Technical Data by Seller

The contents of each section are indicated in detail at the beginning of that section.

Each page is numbered with the section number and the page number of that section.

IMPORTANT NOTICE

No change to this specification shall be binding on any party until an addendum to the specification has been issued. No deviation from this specification shall be accepted by the Engineers' inspector until it has been approved as required by the Engineers' standard procedure.

This Revision 2 summarizes all changes to the Purchase specification dated September 17, 1976, which have been agreed upon by the Seller and the Engineers up to the date of this revision. It replaces Addendum 1 dated April 8, 1977, Addendum 2 dated April 17, 1978, Addendum 3 dated November 2, 1978, Addendum 4 dated July 20, 1979, Addendum 5 dated February 14, 1980, and incorporates the approved changes indicated in Engineering and Design Coordination Report Nos. P00610 and P00723. This specification also incorporates the following changes not based on an approved E&DCR or approved addenda:

SECTION	CHANGE	REASON FOR CHANGE	
Preparation for Shipment	Added electric actuator shipping orientation requirement	S&W requirement	1.46 1.48 1.49 1.50 1.51
Motor-Operated Valve Data Sheets Notes	Added and revised valve descriptions	S&W requirement	1.54 1.55 1.56
Motor-Operated Valve Data Sheets by Engineers	Revised data sheet page 4-3AA, 4-3AAA, 4-3AAAAA, 4-3GGGG, 4-3I, 4-30000, 4-3Y, 4-3YYYY, 4-3QQQQ	S&W requirement	1.58 2.1 2.2 2.3 2.4
Thermal Transient Index	Thermal Transient Nos. 1, 2, and 3 now include valve 2ICS-MOV128	S&W requirement	2.6 2.7 2.8 2.9
Inspection	Deleted requirement for inspectors signoff on TID Form	S&W requirement	2.11 2.12 2.13
Inspection	Added signoff of S&W Certificate of Compliance for Shipping Release	S&W requirement	2.15 2.16 2.17 2.18

SECTION 1

INFORMATION AND REQUIREMENTS

The contents of Section 1 are as follows:

SCOPE 2.10

This specification details the technical and quality assurance requirements for the furnishing and delivery of motor-operated carbon steel valves. 2.13 2.14 2.15

The specification, documents, drawings, and reports listed in Section 3 of this specification are used to develop the requirements specified herein and are considered to be part of this specification. 2.17 2.18 2.19

The Seller shall deliver said valves fob railroad cars Nine Mile Point Nuclear Station, Unit 2 siding, or fob commercial carrier trucks at the jobsite, Scriba, New York, east of Oswego, Route 104, and north of Scriba, New York. 2.21 2.22 2.23

PROJECT SIZE, LOCATION, AND SITE CONDITIONS 2.28

The project consists of an indoor installation of a nuclear fueled boiling water reactor supplying steam to a turbine generator with a nominal electrical output of 1,100 MW. The installation is identified as Nine Mile Point Nuclear Station, Unit 2, of the Niagara Mohawk Power Corporation. The project site is located on the southeast shore of Lake Ontario, about 40 miles north-northwest of Syracuse, New York, in the town of Scriba, New York. 2.31 2.32 2.34 2.35 2.37 2.38

Conrail runs to within 3 miles of the site. Track extensions to the reactor building and the turbine building will be available for shipment of equipment. 2.41

The ambient air temperature varies from -20°F to +100°F. Site elevation is 260 ft above sea level. 2.43 2.44

DEFINITIONS 2.48

Various terms used herein are defined, or mean, as follows: 2.51

Bidder - A company submitting a proposal to fulfill the requirements of this specification. 2.54 2.55

Seller - The company accepting the overall responsibility for fulfilling the requirements of this specification (Whenever the specification is attached to and made a part of a formal contract, 2.57 2.58

the word "Seller" as herein used means the party described in the contract as the "Contractor").

Engineers - Stone & Webster Engineering Corporation, a Massachusetts corporation, or its duly authorized agents restricted to the performance of the particular duties entrusted to them.

Purchaser - Niagara Mohawk Power Corporation, Syracuse, New York.

Approved - This word, when applied by the Engineers to the Seller's drawings or documents, means that the drawings or documents are satisfactory from the standpoint of interfacing with all Purchaser-furnished components of the installation, and/or that the Engineers have not observed any statement or feature that appears to deviate from the specification's requirements. Except for the interfacing with all Purchaser-furnished components, the Seller shall retain the entire responsibility for complete conformance with all of the specification's requirements.

Approved As Revised - These words, when applied by the Engineers to the Seller's drawings or documents, mean that the drawings or documents are approved as defined above except that the changes shown are required for the proper interfacing with Purchaser-furnished components of the installation or are necessary to be in conformance with the specification's requirements. On the basis that the Seller shall retain the entire responsibility for compliance with all of the specification's requirements (except those affected by interfacing with Purchaser-furnished components), the Seller shall either:

a. Incorporate the changes into his drawing or document and resubmit to the Engineers, or

b. Inform the Engineers that the changes cannot be made without prejudice to

the Seller's responsibility under warranty, and resubmit with explanation of the reasons therefor. 3.42

Quality Assurance - Quality Assurance comprises all those planned systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service. Quality Assurance includes Quality Control, which comprises those quality assurance actions related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements. 3.45 3.47 3.48 3.49 3.51 3.52 3.53 3.54

Non-Corrosion Resistant Materials: Materials that do not inherently resist oxidation or chemical attack in water, air, and/or the operating environment. These shall include all carbon and low-alloy steels, and unalloyed cast iron. 3.58 4.3 4.6 4.7

The definitions of Section 1.4 of ANSI-N45.2.1 and N45.2.2, and the following shall apply: 4.9 4.10

Grade III Water: Water having the requirements specified for "Fresh Water" in Section 3.2 of ANSI-N45.2.1. 4.12 4.14 4.15

Grade IV Water: Fresh tap water with a pH of 5.5 to 8.0. 4.17 4.18

FURNISHED BY THE SELLER 4.23

Valves described in the "Motor-Operated Valve Data Sheets by Engineers/Seller" and other supplemental services to be supplied by the Seller shall consist of, but not be limited to, the following: 4.26 4.27

1. Drawings and Material List 4.31
2. Documentation and certain procedures as stated in the Specification 4.34 4.35
3. Manufacture and testing of valves 4.38
4. Installation and Operating Instructions 4.40
5. Shipment. 4.42

FURNISHED BY THE PURCHASER

The equipment, materials, and services to be furnished by the Purchaser shall include the following:

1. An inspector for shop inspection of important manufacturing and testing operations.

2. Unloading, storage, and installation service at the power plant site.

CONDITIONS OF SERVICE

Motor-operated valves outside the primary containment will be subject to the following ambient service conditions:

1. Normal Service Conditions

Pressure:	0.0 to -1.0 inch water gage static pressure
Temperature:	40°F to 150°F
Relative Humidity:	20% to 90%
Radiation:	5.3×10^3 rads, 40-year integrated dose

2. Accident Service Conditions

Pressure:	0.0 to 7 inch water gage static pressure
Temperature:	212°F for 6 hr, followed by 150°F for 99 days
Relative Humidity:	20% to 100%
Radiation:	1.7×10^5 rads, 6-month integrated dose

Motor-operated valves inside the primary containment and all valves designated as "Active" on the Valve Data Sheets will be subject to the following ambient service conditions:

1. Normal Service Conditions

Pressure:	-0.5 psig to 2.0 psig
Temperature:	40°F to 150°F

Relative Humidity:	20% to 100%	5.57
Radiation:	8.8 x 10^8 rads, 40-year integrated dose	6.1 6.2
2. Accident Service Conditions		6.5
Pressure:	-0.5 psig to 45 psig	6.7
Temperature:	340°F for 3 hr, followed by 320°F for 3 hr, followed by 250°F for 18 hr, followed by 200°F for 99 days	6.11 6.12 6.13 6.14
Relative Humidity:	20% to 100%	6.17
Radiation:	2.6 x 10^7 rads, 6-month integrated dose	6.19 6.20

PROCUREMENT, FABRICATION, AND CANCELLATION PROVISIONS 6.24

The procurement of material and the fabrication of 6.27
the Seller's equipment and/or material covered by this 6.28
specification shall not commence prior to receipt by the 6.30
Seller of a written authorization from the Engineers. 6.31

This release will be based on approval of Seller's 6.34
engineering and drawing information. Should the Seller deem 6.36
it necessary to purchase materials or fabricate prior to 6.37
release by the Engineers, he shall submit a written request
to the Engineers. 6.38

If the Purchaser cancels the project before 6.40
authorization for fabrication, cancellation charges on this 6.41
equipment and/or material shall be based only on actual 6.42
charges incurred and shall not include procurement and 6.43
fabrication charges.

APPLICABLE DOCUMENTS 6.47

Various codes (and addenda thereto), standards, or 6.50
other documents that are mentioned by short-form name 6.51
elsewhere in this specification are fully identified below.
To the extent that these documents apply, as stated herein, 6.53
the version of the document that is applicable shall be as 6.54
itemized below. It is recognized that a later version of 6.55
some of the dated documents may become mandatory under
regulations that have jurisdiction. If this develops, the 6.57
newer version of each document that changes will be
specifically identified by means of an addendum to this 6.58
specification; if the changed requirements in the newer
document have a demonstrable effect on the cost to the 7.1

Seller of doing the work, an adjustment will be made to the purchase order price.

If there is or seems to be a conflict between this specification and a referenced document, the matter shall be referred to the Engineers, who will clarify the matter in writing.

The various documents mentioned herein are as follows:

Short Name As Used Herein	Date of Issue	Complete Identification of the Document and of the Sponsor Organization
ASME III	7-1-74	American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components and addenda dated 6-30-74, 12-31-74, 6-30-75, and 12-31-75
ANSI-N45.2.1	1973	American National Standards Institute, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants"
ANSI-N45.2.2	1972	American National Standards Institute, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants"
SNT-TC-1A	1968	Recommended Practices for Nondestructive Testing, Personnel Qualification, and Certification
"IEEE Std. 112A	Sept. 1964	Institute of Electrical and Electronics Engineers, Test Procedure for Polyphase Induction Motors and Generators
IEEE Std. 382	1972	Institute of Electrical and Electronics Engineers, Trial-use Guide for Type Test of Class 1 Electric Valve Operators for Nuclear Power Generating Stations

Short Name As Used Herein	Date of Issue	Complete Identification of the Document and of the Sponsor Organization	
MSS-SP-55	1971	Manufacturer's Standardization Society of the Valve and Fittings Industry, Quality Standard for Valves, Flanges, and Fittings and other Piping Components (Visual Method)	8.14 8.15 8.16 8.17 8.18 8.19
MSS-SP-61	1961	Manufacturer's Standardization Society of the Valve and Fittings Industry, Hydrostatic Testing of Steel Valves	8.23 8.24 8.25 8.26
NEMA MG1	1972	National Electrical Manufacturer's Association, Motors, and Generators	8.30 8.31 8.32
SSPC-SP-6	1963	Steel Structures Painting Council Surface Preparation Specification, "Commercial Blast Cleaning"	8.36 8.37 8.38 8.39
Regulatory Guide 1.38	March 1973	U.S.N.R.C. "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants"	8.43 8.44 8.45 8.46 8.47 8.48
Regulatory Guide 1.84	June 1975	U.S. Nuclear Regulatory Commission, Regulatory Guide 1.84, Rev. 2, "Code Case Acceptability, ASME Section III Design and Fabrication."	8.51 8.52 8.53 8.54 8.55
Regulatory Guide 1.85	June 1975	U.S. Nuclear Regulatory Commission, Regulatory Guide 1.85, Rev. 2, "Code Case Acceptability, ASME Section III Materials."	9.1 9.2 9.3 9.4 9.5

Other standards not listed herein but referenced in this specification are included in Table NB-3691-1 of ASME III. 9.9 9.10

RESPONSIBILITY

The Seller shall be completely responsible that the equipment and/or material furnished under this specification is of high quality in every respect, with first-class workmanship throughout, and entirely suitable for the purpose outlined herein or reasonably inferred therefrom. Therefore, if any requirement of this specification is deemed by the Seller to be incorrect, unsuitable, contradictory, or such that conformance therewith would diminish or adversely affect in any way the Seller's responsibility, the Seller has specifically delineated his objections and the reasons therefor in his proposal, so that they are resolved before the order is placed. In all other respects the Seller, by accepting the order, shall be deemed to have agreed that conformance with the specification's requirements will not prejudice in any way the Purchaser's rights under warranty.

TECHNICAL REQUIREMENTS

The Nine Mile Point Nuclear Station - Unit 2 has certain nuclear power systems which are classified as ASME III Code Class 1, Class 2, or Class 3.

The valves in these Code Class 1, 2, and 3 piping systems shall be designed, fabricated, certified, tested, and inspected in accordance with ASME III. These valves are identified in this specification on the Motor-Operated Valve Data Sheets by the suffix of 1, 2, or 3 to the valve description number. The classification 1, 2, or 3 applies to the entire valve assembly. There are no classification changes across individual valves.

Valve Mark No. 2ASS-MOV109 is identified with the suffix 4 to the valve description number. This valve shall comply to all the requirements of ASME III, Code Class 2 and the requirements of this specification, except that the Code Symbol Stamp and the Manufacturer's Data Report are not required.

Valves shall conform to the following general requirements, unless otherwise noted in the "Motor-Operated Valve Data Sheets by Engineers:"

1. Gate valves shall be outside screw and yoke type, with rising stem. Butt-welded gate valves shall have flexible wedge gates. All gates shall have guides for the full travel. These guides shall be hardfaced for all valves with a rating of 600 psi or higher. Guides shall be hardfaced for gate valves of the 150 and 300 psi pressure classes if

the stem orientation is listed as other than vertical on the "Motor-Operated Valve Data Sheets" under "Special Requirements."

2. Globe valves shall be outside screw and yoke type, with rising stem and swivel plug.

3. All forged steel valves, 2 1/2 inch and larger, shall be furnished with a "live-loading" feature for the packing assembly.

The 600-lb pressure class gate and globe valves, 2 inch and smaller, shall have a seal-welded bonnet design. The 1,500-lb pressure class gate and globe valves, 2 inch and smaller, shall have a no-bonnet design.

Where socket weld end valves are specified, the valve end dimensions shall conform to the applicable provisions of ANSI B16.11.

End flanges shall be integral with the valve body. Dimensions, tolerances, and drilling shall be in accordance with ANSI B16.5 for each respective pressure class. Flanges shall be fully machined on the joint face in accordance with MSS-SP-6.

Flanged and welding-end valves shall conform to the face-to-face and end-to-end dimensions of the manufacturer's standard for each respective pressure class for forged steel valves.

Gate and globe valves shall have bolted packing glands and shall be constructed with a back seat so that they may be repacked while open and under full pressure.

The stuffing boxes of valves subject to vacuum under normal operating conditions shall be provided with a water seal arrangement.

For eliminating the bonnet overpressurization problem on flexible or split-wedge type gate valves 2 1/2 inches and larger, each valve shall be provided with a 1/2-inch socket-welded connection located in the valve bonnet. A 1/2-inch nipple, 6 inches long ±1/2-inch, socket welded on one end and threaded on the other end, shall be used, with a cap on the threaded end. The threaded cap shall be 3000 lb, ASME SA105 and the nipple shall be Sch. 160, ASME SA106, Gr. B seamless pipe. The threads shall conform to ANSI B2.1, standard for pipe threads. The threaded connections shall conform to the requirements of ANSI B16.5. Location of the connection shall be shown on the Vendor's drawing and be subject to Engineers' approval.

When required, seals shall be provided to retain grease and keep dirt and moisture out of bearings. Alemite lubricating fittings shall be furnished to lubricate bearings, yoke nuts, or bushings. 10.49 10.50

All sliding and seating surfaces shall be properly finished to prevent galling and seizing. 10.52 10.53

Valves of the same size, type, material, and pressure-temperature rating shall have interchangeable parts in order to reduce spare parts inventory. 10.55 10.56

For Class 1 valves only, the certified stress report required by ASME III must be submitted to and approved by the Engineers prior to manufacturing. 10.58 11.1

Valves shall be "N" stamped in accordance with the requirements of Article NA-8000 of ASME III, except Mark No. 2ASS-MOV109. 11.3 11.4

All forgings shall be clean, free from unacceptable defects, and have exterior and interior surfaces suitable for nondestructive examination. Unacceptable defects shall be removed or reduced to an acceptable size by suitable mechanical or thermal cutting or gouging methods and subsequently repaired, heat treated, and inspected in accordance with ASME III. The defects shall be cleaned out to solid metal before repairing. The repair welding and examination of valve pressure retaining parts, if required, shall be done in accordance with ASME III. 11.6 11.7 11.8 11.9 11.11 11.12 11.13

Heat treatment procedures shall be submitted to the Engineers for approval prior to production or repair welding. 11.15 11.16

Heat treatment records shall be made available to the Engineers' Shop Inspector. 11.18

When operating conditions are such that the valve generated noise level exceeds 85 dba at any point 3 feet downstream of the valve and 3 feet out from the pipe and valve, the Bidder shall state the estimated maximum noise for that valve. As an option, the Bidder shall offer corrective measures to reduce the valve noise to 85 dba. The sound level in dba is referenced to 2×10^{-5} newtons/meter^2. 11.20 11.21 11.22 11.23 11.24

The motor-operated valves shall be visually inspected for conformance to the specification and to "Approved" manufacturer's drawings. In addition, the Seller's inspector shall perform a dimensional check of the assembled motor-operated valves and shall record or check, 11.26 11.27 11.28

as a minimum, the following as-built dimensions: overall length, height, end dimensions, and operator dimensions and orientation. 11.29

The use of Code Cases for ASME III is restricted to those listed in Regulatory Guides 1.84 and 1.85 and is limited as stated in these Guides. If there is, or appears to be, a conflict between the provisions of a Code Case and the requirements of this specification, the matter shall be brought to the attention of the Engineers in writing for resolution. 11.31 11.32 11.33 11.34 11.35

MATERIALS 11.39

Valve body, bonnet, and trim materials shall be as specified on the "Motor-Operated Valve Data Sheets by Engineers/Seller." 11.42 11.43

All materials for pressure retaining parts shall be in accordance with ASME III and Seller shall provide Certified Material Test Reports as required by the Code and this specification. Impact tests are required for the Code Class 1 pressure retaining materials defined in NB-2300 of ASME III. Impact tests are required for Code Class 2 pressure retaining materials defined in NC-2300 of ASME III when specified under "Special Requirements" on the Motor-Operated Valve Data Sheets by Engineers. When required, impact tests shall be in accordance with NB-2300 or NC-2300 as applicable except that the Charpy V-notch value for bolting materials over 1 inch nominal diameter shall be 25 mils lateral expansion and 45 foot-pounds absorbed energy. The lowest service temperature the materials will be subjected to is 40°F. Impact test records shall be submitted with the Certified Material Test Reports. 11.46 11.47 11.48 11.49 11.50 11.51 11.52 11.53 11.54

The Seller shall offer his standard valve and trim insofar as possible. If materials and the method of trim installation vary from size to size, the Seller shall specify the range of sizes each material and installation procedure covers. 11.56 11.57 11.58

Studs for valve bonnet and packing gland shall be alloy steel in accordance with ASME SA-193, GR. B7. Nuts shall be ASME SA-194, Gr. 2H. Recommended torque figures for packing gland nuts shall be listed on the manufacturer's drawings. 12.2 12.3 12.4

Valve stems for gate and globe valves shall be forged stainless steel, ASTM A276, Grade 410, Condition T, with a minimum tempering temperature of 1100°F. Valve stems shall be furnished with a 16 RMS or finer finish. 12.6 12.7 12.8

Packing on valve stems shall be preformed Grafoil with preformed John Crane 187-I as the top and bottom ring or equal in performance, acceptable to the Engineers.

All valve materials must be capable of meeting the radiation dose specified in CONDITIONS OF SERVICE.

VALVE MINIMUM WALL THICKNESS

Valve wall thickness measurements are required on all valves larger than 1 inch nominal pipe size.

Valve wall thickness measurements shall be taken, after machining has been completed and prior to assembly, using qualified inspectors and procedures, approved by the Engineers. Wall thickness measurements shall not be started until the Seller has received a copy of his procedures stamped "Approved" by the Engineers.

Valves shall be inspected visually and special attention shall be paid to ground areas, thin areas, and areas which may be suspect and they shall be measured as outlined herein. Valves shall be examined in repaired areas.

Valve bodies shall have wall thickness measured using deep throated calipers (or equal) or ultrasonic thickness measuring devices. A sufficient number of measurements shall be taken to assure that the finished valve body and bonnet meet the minimum wall thickness requirements as shown on vendor's detail valve drawings which, in turn, must meet the requirements of ASME III.

As a general guide, depending upon the configuration of each particular valve, measurements shall be taken and recorded of the body, port openings and flange thicknesses, at four points 90 deg. apart for valves 4 inches and smaller, and at eight points 45 deg. apart for valve 6 inches and larger, in a vertical plane, and at horizontal intervals 1 to 2 inches from the port ends of the valve, at the midpoints between each port end and the valve throat, and also in the throat area on each side of the body bowl portion of the valve. Valve bonnet flanges shall be measured for thickness in the same manner and number of locations as body flanges. The bonnet shall be measured for thickness at several locations, equally spaced around the periphery of the valve bonnet wall.

In addition to the aforementioned requirements, all valves shall be visually inspected for damage. Ground areas, or thin areas which may be suspect, shall have thickness measurements taken as previously outlined. The

dimensional check of thicknesses shall include remeasurement of those areas which have undergone machining or repairs. This applies particularly to forged valve bodies in which finish machining and drilling could affect wall thickness.

Valve wall thickness measurements shall be documented, preferably on cross-sectional valve drawings or sketches identifying the measurements and comparison with specified minimum wall thicknesses. The ultrasonic measurement technique shall be certified to have a maximum error in repeatability and accuracy of not more than 2 percent of the wall thickness. Ultrasonic examination for thickness determination, if performed, shall be in accordance with ASME Section V, T-550.

MOTOR OPERATORS

Motor operator shall be "Limitorque" or Engineers' approved equal mounted on the valve yoke in a manner that will ensure proper alignment and also ensure against deleterious effects of either possible leakage from the valve stem packing or high temperature by conduction, convection, or radiation.

The motor-operated valve shall include yoke, body, gear boxes, and complete motor-operated unit. The entire operating mechanism shall be designed to withstand any shock resulting from operation with improper setting of limit switches or torque limiting devices or with foreign matter lodged in valve. The operator shall be capable of closing or opening the valve against maximum differential pressure and maximum flow as specified on the "Motor-Operated Valve Data Sheets by Engineers." It shall successfully open, close, and seat the valve within the range of operating voltage specified.

The motor operator shall be furnished with a handwheel. The handwheel shall not rotate during electric operation but must be responsive to manual operation at all times except when being operated electrically. The motor shall not rotate during hand operation nor shall a stalled motor prevent manual operation. When in manual operation, the unit shall remain in this position until the motor is energized, at which time the valve operator shall automatically return to electric operation. It shall remain in motor position until the handwheel operation is again desired.

The bolting at the motor operator to yoke joint and the yoke to bonnet joint shall be provided with locking devices, which shall be indicated on the manufacturer's drawings. In addition, the Seller shall assure that the

stem nut locknut is properly secured by staking at two points 180 degrees apart, or by other means successfully used by the Seller. Refer to Section 2.

The design of gearing shall be such that during manual operation the maximum force required on the handwheel to open or seat the valve should not be greater than 80-85 pounds.

In the event that this is not practical, specific waivers for forces not to exceed 100 pounds may be granted by the Engineers.

The handwheel retaining nut shall be welded to the handwheel hub, where applicable, to provide for the use of an air driven lug or torque wrench for operating valves.

The maximum handwheel input torque and force (rim-pull) to achieve the motor torque and to ensure proper operation of the valve shall be determined by the Seller and stamped on a metal plate permanently attached to the handwheel.

The valve control shall have a built-in lost motion device that travels a minimum of 135 deg before imparting a hammer-blow to start the valve in either the closing or opening direction. This lost motion device shall also permit the motor to attain full speed before the load is encountered, and the load should be shared equally by the two lugs making up the hammer-blow device.

Bearings shall be ball or roller type throughout, designed to facilitate renewal, except for guide bushings which shall be sleeve type. Seals shall prevent lubricant escape or foreign particle entrance.

Each motor operator shall be removable from the valve for maintenance without dismantling the valve.

All ac motors shall be rated for operation at 575-V, 3 phase, 60 Hz. The motors shall have 15 min. short-time rating and conform to NEMA standard MG1, Sections 10.35, 12.41 and 12.42, unless otherwise noted. The motors shall operate under all service conditions with terminal voltage variation between 10 percent above and 20 percent below rated voltage.

All dc motors shall be rated for operation at 120 V dc. The motors shall have 5 min. short-time rating and conform to NEMA standard MG1, Sections 10.63, 10.64, and 12.62, unless otherwise noted. The motors shall operate under all service conditions. During an emergency, the

station direct current voltage might gradually deteriorate from 140 V dc to 101 V dc at the terminals of the dc motors. Therefore, each direct current motor shall be capable of delivering adequate power so that the driven equipment will perform its function properly under this condition of varying voltage.

The motor operator shall open and close gate valves against full differential pressure at a rate of not less than 12 inches per minute and globe valves at a rate of not less than 4 inches per minute unless otherwise specified on the "Motor-Operated Valve Data Sheet by Engineers/Seller."

Terminals shall be provided for connecting remote control stations or relay contacts to provide for remote operation of the valves.

A position transmitter (50 ohm, 25 watt potentiometer suitable for 125-V dc source) shall be supplied if specified on the "Motor-Operated Valve Data Sheet by Engineers" under Special Requirements. Remote position indicator will be provided by the Purchaser.

A limit switch assembly shall be supplied and mounted integrally with the operator. A total of 16 limit switches, adjustable either independently or in groups, shall be provided for control and indication, 12 of which are for the Engineers' use. There shall be an equal number of contacts that open or close at a given setting. The switches available for external control, interlocking, and monitoring shall be capable of being set at positions of valve travel other than those settings required for basic valve operator control. The type, quantity arrangement, and setting of switches shall be subject to approval by the Engineers.

Each valve control shall be equipped with two torque switches. The torque switches shall be adjustable. One switch shall be responsive to loads encountered in closing direction of travel and the other in opening direction of travel. The closing torque switch shall be employed for wedging gate or globe valves to control the predetermined seating thrust.

The motor operator and valve shall be furnished as a matched/designed system for the entire range of conditions defined in this specification.

The Seller shall submit the calculations for the sizing of each motor operator, including torque switch settings, to the Engineers.

The following information shall be determined and tabulated for each motor-operated valve: a) maximum thrust/torque capability of the valve and motor operator, b) maximum developed thrust/torque and stalled thrust/torque of each motor operator, c) recommended torque switch settings, d) maximum torque switch setting for the unit to prevent the operator from developing the lesser of the maximum allowable torque for the valve and for the operator, e) maximum torque switch setting to protect the valve pressure boundary, and f) handwheel input, force (rim-pull) and torque, to achieve motor torque. 15.14 15.15 15.16 15.17 15.18 15.19 15.20 15.21

The torque switches shall be calibrated by the Manufacturer of the valve operator and confirmed during Performance Tests by the valve manufacturer. 15.23 15.24

Gate and globe valves shall be stopped in the fully open position by the geared limit switch. Gate and globe valves shall be stopped in the fully closed position by the torque limiting device. 15.26 15.28 15.29

The design of the motor-operated valve assembly shall be such as to lock the discs in position to prevent creeping from the fully seated position and relaxation of torque when the operator is deenergized. 15.31 15.32

Switch contacts shall have a 115-V ac, 20 amp or 125-V dc, 1/2 amp inductive interrupting rating unless otherwise specified. 15.34 15.35

A space heater shall be provided inside each switch compartment suitable for 120 V ac. 15.37

Lubricants used shall be suitable for service conditions specified and shall be listed on the "Motor-Operated Valve Data Sheet by Seller." 15.39 15.40

Motor operators, including the drive motor and all electrical components, shall operate satisfactorily under the conditions given under CONDITIONS OF SERVICE in this specification and as specified on the "Motor-Operated Valve Data Sheets by Engineers." Where specified on the data sheet, valve motor units shall be furnished with radiation resistant internals. 15.42 15.43 15.44 15.45

Motors shall be totally enclosed with Class B or Class H insulation as specified on the "Motor-Operated Valve Data Sheets." This insulation shall be nonhygroscopic and suitable for the conditions encountered in power generating stations. 15.47 15.48 15.49

The manufacturer shall submit prototype test data to demonstrate satisfactory operation in the combined pressure, temperature, humidity and radiation environment specified. The tests shall be performed and documented in accordance with IEEE Standard 382, except that the test profile used to simulate accident environment shall conform to the values and durations specified for each parameter under the service conditions specified in CONDITIONS OF SERVICE. Delivery of the valves shall not commence until the test data has been stamped "Approved" by the Engineers.

The valves inside the containment will be inaccessible for maintenance and lubrication during normal operation for periods up to 18 months. The actuator shall perform satisfactorily for such periods without maintenance.

The motor operator shall be capable of being operated three times within the first hour after the accident service condition specified in CONDITIONS OF SERVICE becomes effective and five times during the 7 days thereafter.

WELDING

General

All welding, welding procedures, welding procedure qualification, and welder qualification shall be in accordance with the requirements of ASME III and the additional requirements of this specification. Each welding procedure shall be submitted for review and stamped approved by the Engineers prior to the start of production welding. Each welding procedure shall include a welding procedure qualification test report and a means for identifying the joint or joints for which it will be used in production.

Welding shall not be performed on materials that are below a minimum temperature of 50°F.

Only low-hydrogen type electrodes shall be used when the shielded metal arc welding (SMAW) process is selected for production.

Where impact testing is required by this specification, the weld procedure qualification tests shall include impact testing as required by ASME III. Minimum service temperature shall be as stated in MATERIALS.

All weld filler metals shall meet all of the requirements of ASME III and the Applicable ASME II, Part C, filler metal specification.

Weld End Preparation 16.43

All weld end preparation for valves which will be field welded shall be in accordance with Stone & Webster Drawing No. STD-SP-1056-3-5, except Mark No. 2ASS-MOV109, which shall comply to STD-SP-1056-3-5, Fig. A bored to the "B" dimension. 16.45 16.46 16.47 16.48

The letter in the Valve Description Number immediately following the Code Class is a code to designate the wall thickness or pipe schedule of the piping adjoining the valve and is defined on the "Motor-Operated Valve Data Sheet Notes." 16.51 16.52

MARKING 16.56

Each valve shall be provided with a stainless steel nameplate permanently attached to the exterior of the valve, in an accessible location external to any normally insulated surface, and observable while the equipment is in operation. The nameplate shall contain the following information: 17.1 17.2 17.3 17.4 17.6

Manufacturer's name, model, and serial number 17.9

Year built 17.11

Purchaser's mark number and valve description number 17.13 17.14

Primary service pressure rating 17.16

Design pressure 17.18

Design temperature 17.20

Stress relieving and radiographing 17.22

Code symbol and National Board number (except as noted in TECHNICAL REQUIREMENTS). 17.24 17.25

All valves shall be legibly marked with the heat number as well as other identification marks specified by ASME III. 17.29

All globe valves shall have bridge wall marking or flow direction arrows marked on the valve body to indicate pressure under the valve disc. 17.31 17.32

Material which requires nondestructive examination shall be permanently marked (i.e., RT, PT, MT) when examination has been accomplished and accepted. 17.34 17.35

Manufacturer's name or trademark, primary service pressure rating, size, and material designation shall be forged on the body or bonnet of each valve or stamped on a metal plate on the bonnet structure in accordance with applicable provisions of MSS-SP-25.

The motor and motor operator shall be provided with a nameplate marked in accordance with the Manufacturer's standard and with the Purchaser's mark number. The handwheel shall be marked as specified in MOTOR OPERATORS.

SEISMIC REQUIREMENTS
(Valves)

GENERAL

The Seller shall confirm in writing and shall submit a report, including calculations or test data, for review by the Engineers which support his statement that the valve assembly furnished under this specification meets the requirements for the Design Base Earthquake and Operating Base Earthquake listed below. The Seller shall, as part of his report, provide natural frequency data determined by either analysis or test. The analysis or test shall confirm that the resulting deflections shall not cause damage to the valve assembly which may be detrimental to its capability to function as specified.

The Seller is afforded the options noted x for qualifying his equipment to the specified seismic environment.

Static Analysis	(X)	valve assembly
Dynamic Analysis	( )	
Seismic Testing	(X)	valve operator
Operability Testing	(X)	valve assembly (Active Valves 2 inch and Larger)

Sellers shall submit a summary of the qualification program to be utilized. Sellers may consider exercising excluded options only after discussion with and written concurrence from the Engineers. If given more than one option, the Seller shall indicate which, or how many, options he intends to utilize to qualify his equipment for the given seismic input. If testing is chosen or specified, Sellers shall submit details of the proposed test for review. If static or dynamic analysis is the mode of qualification, the Seller's summary shall include a description of the mathematical model and the analytical method intended for use in qualifying the equipment. If the qualifying program is predicated upon existing data, either

partly or entirely, the data, and reasons why it is considered applicable, should be submitted with the summary.

Sellers shall include a schedule of submittals, interface resolutions, and certificates to be submitted to or received from the Engineers, as discussed herein.

In the performance of tests or analyses to establish seismic adequacy, the structural interaction of the entire assembly (e.g., valve-operator assembly) should be considered. Testing of the valve assembly may be employed in accordance with the instructions provided. Superposition of test results for the operator with analysis results for the valve body and yoke assembly (including the effects of the operator) may be utilized, providing the applicability of the procedure can be demonstrated. As a minimum, the Seller's seismic qualification program shall include testing of the operator.

The Seller is required to show that the valve will have its lowest natural frequency above a value of 33 cycles per second. This requirement may be demonstrated by analysis or test methods.

A final analysis/test report shall be compiled by the Seller and submitted to the Engineers for their review and certification. The Seller shall also submit a Certificate of Compliance which will be stamped and signed by a Registered Professional Engineer with the statement that he has seen and reviewed the adequacy of the method for establishing that the seismic design requirements have been met. A summary of the calculation or test method shall be included in the compliance statement. The summary need be only a short paragraph, but should include code references and equations. The certificate shall also be signed by a knowledgeable officer of the Seller's company.

STATIC ANALYSIS

The Seller is required to establish valve assembly adequacy for both seismic conditions given below. Each of the three defined directions of earthquake input (two horizontal and one vertical taken orthogonally) shall be evaluated separately. The calculated result of the three stress analyses shall be superimposed on a square root of the sum of the squares (SRSS) basis. Horizontal and vertical seismic accelerations and associated allowable stress limits for both seismic conditions follow.

Operating Base Earthquake (OBE) 19.24

The valve assembly shall be designed to be capable of continued operation with all maximum operating loads acting simultaneously with the seismic loadings. The horizontal (N-S & E-W) and vertical seismic loadings are: 19.26 19.27 19.30

g(1) = 2.0 (horizontal) 19.33

g(2) = 2.0 (vertical) 19.35

NOTE: g = acceleration as a fraction of acceleration due to gravity. 19.38 19.39

Design Basis Earthquake (DBE) 19.44

The valve assembly shall be designed to withstand the combined effects of all maximum operating loads, acting simultaneously with seismic loads without loss of safety function or structural integrity. The horizontal (N-S & E-W) and vertical seismic loadings, respectively, are: 19.46 19.47 19.48 19.49

g(3) = 3.0 (horizontal) 19.51

g(4) = 3.0 (vertical) 19.53

Instructions for Static Analysis 19.57

1. The base natural frequency of the valve assembly must be determined and shown to be above a value of 33 Hz. 20.1 20.2

2. The Seller is required to multiply the appropriate masses of the valve assembly components by the acceleration values in three orthogonal directions, so as to load the valve assembly in these directions. The calculated result of the three stress analyses shall be superimposed on a square root of the sum of the squares (SRSS) basis. 20.5 20.6 20.7 20.9 20.10

3. The structural load-carrying members, whether internal components or external components, such as hold-down bolts, must be checked to ensure adequacy of design under seismic loading. 20.12 20.13 20.14

4. The valve assembly is to be analyzed on a worst-case basis with regard to operating conditions. A check of critical area deflections must be made to ascertain that detrimental damage will not occur. The deflection at the center of gravity of the 20.16 20.18 20.19 20.20

valve operator, relative to the valve body, shall be determined. 20.21

5. The static analysis report shall contain: a title page, abstract, table of contents, introduction (objectives, methods of analysis, assumptions, design criteria), summary of results, geometry and materials data, references, and the detailed analysis. 20.23 20.24 20.25 20.26

6. Allowable Stress 20.29

Valves which are ASME Boiler and Pressure Vessel Code ASME III (Class 1) have the following combinations and categorizations of load with relevant stress limits in accordance with paragraph NB-3500: 20.31 20.32 20.34

ASME Section III Class 1 valves shall be designed in accordance with the provisions of paragraph NB-3500 of the ASME Boiler and Pressure Vessel Code (latest revision). In the design of Class 1 valves, the Operating Basis Earthquake (OBE) loads defined herein shall be considered in the evaluation of upset plant operating conditions. The Design Base Earthquake shall be considered in the evaluation of faulted plant operating conditions. The earthquake loadings shall be combined with relevant operating condition loads in addition to other specified dynamic loads (if any). Operating loads to be combined with seismic loads are those due to maximum operating conditions and/or (relevant) transient conditions defined elsewhere in this specification. 20.37 20.38 20.39 20.40 20.41 20.42 20.43 20.44 20.45

The following seismic cyclic criteria will be used for all Class I valves (See ASME Section III NB-3550): 20.47

1. A total of five OBE and one DBE with 20 cycles of maximum response per earthquake, shall be assumed to occur. 20.49 20.50

2. Cyclic stresses due to earthquake should be added to cyclic stresses due to transient conditions defined elsewhere in this specification, in accordance with ASME Section III, paragraph NB-3550. 20.52 20.53 20.54

For ASME Section III, Class 2 (NC) or 3 (ND) valves, use the following criteria: 21.1 21.2

Design Condition	Membrane Stress Limit (Pm)	Membrane + Bending Stress Limit (Pm + Pb)
I-OBE plus Maximum Operating Loads	1.1 S	1.65 S
II-DBE plus Maximum Operating Loads	2.0 S	2.4 S

Where:

(a) S - Allowable stress values at the design temperature from Tables I-7, 8, ASME Section III, Appendix I.

(b) The standard or alternative design rules of NC3500 and ND3500 may be used in conjunction with the stress limits specified. For design and normal conditions, valve bodies shall conform to the requirements of ASME III, NC3500 or ND3500, as applicable.

(c) Operating loads, to be combined with seismic loads, are those due to the maximum operating conditions identified elsewhere in this specification.

(d) Valve nozzle (piping load) stress analysis is not required when both the following conditions are satisfied by calculation: (1) section modulus and area of a plane, normal to the flow, through the region of valve body crotch is at least 10 percent greater than the piping connected (or joined) to the valve body inlet and outlet nozzles; and, (2) code allowable stress, S, for valve body material, is equal to or greater than the code allowable stress, S, of connected piping material. If unable to comply with this requirement, the design by analysis procedure of NB-3545.2 is an acceptable alternate method.

(e) Casting quality factor of 1.0 shall be used.

(f) Requirements for the acceptability of a valve design are not intended to assure the operability adequacy of the valve.

DYNAMIC ANALYSIS

The Seller is required to establish valve assembly adequacy for both earthquakes given below. The analysis will be based on the modal response technique by computing the frequencies and modal responses. Each of the three defined directions of earthquake input (two horizontal and one vertical taken orthogonally) shall be evaluated separately. The calculated result of the three stress analyses shall be superimposed on a square root of the sum of the squares (SRSS) basis. Horizontal and vertical seismic accelerations and associated allowable stress limits for both seismic conditions follow:

Operating Base Earthquake (OBE)

The valve assembly shall be designed to be capable of continued operation with all maximum operating loads acting simultaneously with the seismic loadings. The horizontal (N-S & E-W) and vertical seismic loadings are the same as those listed for static analysis.

Design Basis Earthquake (DBE)

The valve assembly shall be designed to withstand the combined effects of all maximum operating loads, acting simultaneously with seismic loads without loss of safety function or structural integrity. The horizontal (N-S & E-W) and vertical seismic loadings are the same as those listed for static analysis.

Instructions for Dynamic Analysis

1. Elements of an acceptable mathematical model and analytical method include the following:

   a. The critical areas of the valve assembly shall be defined.

   b. The significance of various valve assembly components shall be examined.

   c. A tractable model with necessary assumptions shall be defined.

   d. The characteristics of supports and/or attachments to be included in the model shall be developed.

   e. The properties of connecting members between masses necessary to approximate the structural stiffness of the system shall be defined.

f. The extent to which the proposed mass breakdown permits determination of stresses and deflections in significant or critical areas shall be defined.

g. The decision to include an element of the valve assembly as a separate mass point may depend on the natural frequency of the element. Estimates of the natural frequencies of the elements which are large enough to affect the response of the system shall be determined prior to lumping the element stiffness and mass.

2. Once the mathematical model for the valve assembly is established, natural frequencies, mode shapes, and participation factors can be readily calculated. The horizontal and vertical seismic loadings (as defined for static analysis) are used as input to calculate the modal accelerations at the mass points identified in the model. The modal inertia forces are obtained by multiplying the lumped masses of the model by the calculated modal accelerations. These forces are applied statically to the model while retaining the vector directionality and the resultant modal internal loads and stresses. For the amplified response spectra provided, the Vendor shall evaluate each direction of earthquake separately; i.e., vertical, transverse, and longitudinal (along component horizontal axis). For each analysis, modes which are closely spaced (within ±10 percent of an object mode) shall have their respective responses summed on an absolute basis. This sum (or group of sums) shall be combined with the remaining "singular" modal responses on a square root of the sum of the squares (SRSS) basis. The calculated result of the three stress analyses shall be superimposed on an SRSS basis.

3. The valve assembly is to be analyzed on a worst-case basis with regard to the operating condition. A check of critical area deflections must be made to ascertain that detrimental damage will not occur. The deflection at the center of gravity of the valve operator relative to the valve body shall be determined.

4. The dynamic analysis report shall contain: a title page, abstract, table of contents, introduction (objectives, methods of analysis, assumptions, design criteria), summary of results, geometry and

materials data, references, and the detailed analysis.

5. Allowable Stress

This item is the same as for STATIC ANALYSIS. It is not repeated here, but applies in all respects as though it were repeated here.

SEISMIC TESTING

The Seller is required to establish seismic adequacy of the valves to be furnished by provision of test data. Valves are required to exhibit a minimum natural frequency above 33 Hz. The acceleration values listed below shall be considered as minimum base input to qualify the equipment by test procedures for the Operating Base Earthquake and the Design Base Earthquake.

Operating Base Earthquake

$g_{(9)}$ = 2.0 (horizontal)

$g_{(10)}$ = 2.0 (vertical)

Design Base Earthquake

$g_{(11)}$ = 3.0 (horizontal)

$g_{(12)}$ = 3.0 (vertical)

NOTE: g = acceleration as a fraction of acceleration due to gravity.

These testing requirements supplement other applicable industry standards (such as "IEEE Guide for Seismic Qualification of Class I Equipment for Nuclear Power Generation Stations," STD-344-1971), or provide guidance for testing where no such codes are available. In any case, the minimum acceptance criterion will include (as applicable) the following:

1. No loss of function, or ability to function, before, during, or after the proposed test.

2. No structural/electrical failure (i.e., connections and anchorages) which would compromise component integrity.

3. No adverse or maloperation before, during, or after the proposed test that could result in an improper safety action.

The acceleration values listed are considered minimum input for testing, principally by sine wave methods. Required Response Spectrum (RRS) may be supplied (or requested) to further define the earthquake environment. If RRS are enclosed with this specification, Test Response Spectrum (TRS) developed by single or multifrequency test methods must be shown to envelop the Required Response Spectrum.

Instructions for Seismic Testing

1. The valve assembly should be mounted as closely as possible to the in-service orientation during testing. Also, the appurtenances and attachment to the valve assembly, such as connecting piping, attached components, and anchoring devices should be the same, or at least similar to that of the intended service condition. If insufficient information concerning the intended service conditions or the interface connections is presented in this specification, the Seller shall contact the Engineers for further definition.

2. Operating conditions which practicably approximate the worst case operating conditions; (i.e., at pressure, temperature, energized, in the operating mode, etc), shall be utilized for equipment testing unless specifically noted otherwise.

3. Accelerometers will be mounted on the test table and throughout the unit in order to monitor test input and output response. The placement of the accelerometers will be specified by the Seller, and approved by the Engineers. Their locations will be selected to produce as much information concerning the dynamic response of the component(s) as possible. The deflection at the center of gravity of the valve operator, relative to the valve body, must be determined.

4. Electrical monitoring will be employed, as applicable, to demonstrate functional continuity.

5. Input motors during testing should be applied to one vertical and one principal (or two orthogonal) horizontal axes simultaneously unless it can be demonstrated that the equipment response along the vertical direction is not sensitive to the vibratory motion along the horizontal direction, and vice versa. The time phasing of the inputs in the vertical and horizontal directions must be such that a purely rectilinear resultant input is

avoided. The acceptable alternative is to have vertical and horizontal inputs in-phase, and then repeated with inputs 180 degrees out-of-phase. In addition, the above-outlined test must be repeated with the equipment related 90 degrees horizontally.

6. Sinusoidal Testing

a. A frequency scan (2 octaves per minute maximum) at a constant minimum acceleration of "g" shall be performed for as much of the range between 1 and 34 cps as practicable. The objective of this test is to determine the natural frequencies, amplification factors, and off-axis (coupling) response of the tested valve assembly and its critical components or appurtenances and to assure general seismic adequacy over the full frequency range of interest. The acceleration input constants to be used are the higher values of those listed for the OBE or DBE above.

b. If the frequency scan results indicate that the response along the horizontal axis is not affected by vibratory motion in the vertical direction, and vice versa, or if a maximum of one fundamental natural frequency is identified, a sinusoidal dwell test may be performed in accordance with the requirements of Item 6c. If dwell tests cannot be justified on this basis, a single or multifrequency testing must be performed to show that the Test Response Spectrum envelops the Required Response Spectrum. A dwell test may be performed at 1.5 times the required input acceleration level in accordance with Item 6c if multiresonances or off-axis coupling responses are evidenced.

c. A "dwell" test of the valve assembly shall be performed at the natural frequencies identified during the "scan." Additionally, other frequencies should be selected if amplification factors of 2.0 or more are indicated. A 20 to 60 second duration is considered acceptable for each "dwell." The acceleration input constants to be used should be the higher of those listed for the OBE or DBE.

7. Sine-Beat Testing 25.56

A sine-beat test may be employed in conjunction with the sine-scan test described under Item 6a. The sine-beat test is an alternative to the dwell portion of the program outlined in Item 6c. The provisions of Item 6b apply in justifying the use of the sine-beat test. The peak amplitudes of input must, as a minimum, equal those required under Item 6c for the OBE or DBE. For the indicated level of equipment damping, the Test Response Spectrum must be shown to envelop the Required Response Spectrum. 25.58 26.3 26.4 26.5 26.6 26.7

8. Qualification programs for random, time history, complex wave, and other multifrequency testing input are considered acceptable alternatives to the sinusoidal vibration test criteria outlined above. For the indicated level of equipment damping, the Test Response Spectrum must be shown to envelop the Required Response Spectrum. 26.9 26.10 26.11 26.12 26.13

9. The Seller shall identify the number and types of operational tests to be conducted before, during, and after the seismic testing program. As a minimum, sufficient post test examination must be made to ascertain that detrimental damage has not occurred. 26.15 26.16 26.18 26.19

10. The Seller may use existing prototype test data provided this data meets the requirements of the specification. If the Seller performs seismic tests to meet these specification requirements, he shall notify the Engineers 2 weeks prior to the conduct of the testing and shall afford the Engineers and the Engineer's inspector the opportunity to witness any or all parts of the tests and inspections. 26.21 26.22 26.23 26.24 26.25 26.26

11. The Seller's documentation test report shall contain substantive information in the following areas (as applicable): 26.28 26.29

a. Description of the testing facilities and equipment including functional capability, calibration dates, etc. 26.31 26.32

b. List of valve assemblies or subassemblies tested. 26.34 26.35

c. Identification of the type of testing input, including intensity level, frequency content, 26.37 26.38

number of axes, input duration, and time history sketches of the typical input. The validity of such testing input shall be demonstrated. The physical installation of the valves on the testing machine shall be described.

d. Describe the number, type, and location of monitoring sensors on each valve assembly and document the response recorded.

e. Identify whether devices were tested in ooperating condition during the testing of valve assemblies.

f. Identify whether subassemblies (devices, etc) were mounted during the testing of assemblies or supporting structures and demonstrate the validity of any tests conducted without the devices (or suitable substitutes) or with the mounted devices in nonoperative condition.

g. Describe frequency finding testing, including sweep rates and amplitude used. Provide a summary of frequency finding test results.

h. In the event that analysis was used by the Seller to determine the testing input, provide a description of the analytical methods and procedures, including sketches of the mathematical models used.

i. Document and discuss any and all malfunctions that occur during the test program.

OPERABILITY TESTING

(For active valves 2 inches and larger as indicated on Motor-Operated Valve Data Sheets by Engineers)

The Seller shall demonstrate valve operability during simulated Design Base Earthquake (DBE) conditions by static deflection testing of the valve assembly. A representative number of active valves, selected according to size, type, and pressure class, shall be tested. Tests described herein shall be performed in addition to the hydrostatic and functional tests outlined elsewhere in this specification. An acceptable static testing program is outlined as follows:

1. The valve assembly should be mounted and orientated in a manner representative of plant installation.

The assembly will include the operator and all appurtenances normally attached in service as applicable. 27.30

2. Design pressure of the valve, as identified elsewhere in this specification, shall be applied throughout the test. 27.33 27.34

3. The actuator and yoke will be deflected by statically loading the valve at the center of gravity of the operator in the direction of the weakest axis and/or most critical axis with regard to demonstrating satisfactory operation. The imposed deflection must, as a minimum, equal that determined by seismic analysis or testing as representative of the DBE condition. 27.38 27.39 27.41 27.43 27.44

4. While in the statically deflected and pressurized condition, operate (stroke) the valve through a minimum of three complete cycles. One cycle shall consist of unseating against design pressure and then reseating against design pressure while statically deflected. The valve must perform its safety-related function within the specified time limits during each operational cycle. 27.47 27.48 27.51 27.52 27.53 27.54

5. A test report shall be provided giving complete details of the test procedures and results. Assumptions and conclusions could be included. 27.57 27.58 28.2

6. The Seller shall notify the Engineers 2 weeks prior to the conduct of the testing and shall afford the Engineers and the Engineers' inspector the opportunity to witness any or all parts of the tests and inspections. 28.4 28.5 28.6

An acceptable alternative to the static testing program outlined above is a dynamic testing program to simulate earthquake effects. The dynamic test may be performed in accordance with the guidelines and requirements of the seismic testing portion of this specification. Valve function must be demonstrated during the dynamic testing program. 28.8 28.9 28.10 28.12

SEISMIC ANALYSIS REPORT 28.16

The Seismic Analysis Report shall contain the following information and be prepared in a step-by-step form that can be readily understood and verified by persons skilled in such analyses. Failure to follow these instructions will be grounds for disapproval and will require Seller's resubmittal. 28.19 28.21 28.22

a. Title Page - Stone & Webster Purchase Order and Specification Numbers, name of equipment being supplied, date of report, prepared for Stone & Webster Engineering Corporation. 28.24 28.25

b. Table of Contents 28.26

c. Summary of Results - Table identifying sections analyzed, maximum stress, allowable stress, factor of safety. Define natural frequency results. Provide page reference to detailed calculation of stress, etc, results. 28.27 28.28 28.29

d. Introduction - Objective, scope, methods of analysis, design criteria, assumptions, critical sections, etc. 28.30 28.31

e. Geometry and Materials Data - Geometry, detail, and assembly sketches, mass and stiffness properties, material properties, with reference to Vendor drawings. 28.32 28.33

f. References - Identify sources of technical methods, equations, material properties, etc. When equations are used in the body of the report, the technical reference should be included. 28.34 28.35

g. Detailed Analysis - This section should be extensive and include frequency analyses, loads analyses, analyses of critical sections, etc. Conclusions should be developed as the analysis is developed. Sketches of computer models should be developed and shown. 28.36 28.37 28.38

h. Input to computer programs should be included. 28.39

i. Description of Computer Programs - No program documentation of well known programs such as ANSYS, STRUDL, etc, is required. Documentation of Vendor programs should include a brief program description and a test case demonstrating the program's validity. 28.40 28.41 28.42

j. Output of computer program - A summary of pertinent results must be in the body of the Seismic Report. Computer output should also be included as an appendix. 28.43 28.44

k. When submitting the Seismic Report to the Engineers for review and approval, include drawings and other data necessary for checking the structural mass and 28.45 28.46

stiffness properties of the equipment to be supplied. 28.47

SEISMIC TEST REPORT 28.52

For testing, the Seller's test report shall contain substantive information in the following areas (as applicable): 28.55

a. Description of testing facilities and equipment including functional capability, calibration dates, etc. 28.58 29.1

b. List of equipment (devices or assemblies) and supporting structures tested. 29.2

c. Identification of the type of testing input, including intensity level, frequency content, number of axes, input duration, and time history sketches of the typical input. The validity of such testing input should be demonstrated. Describe the physical installation of the equipment on the testing machine. 29.3 29.4 29.5

d. Describe the number, type, and location of monitoring sensors on each equipment and document the response recorded. 29.6 29.7

e. Identify whether or not devices were tested in operating condition during the testing of assemblies or supporting structures (i.e., panels and racks). 29.8 29.9

f. Identify whether devices were mounted during the testing of assemblies or supporting structures. Demonstrate the validity of any tests conducted without the devices (or suitable substitutes) or with the mounted devices in nonoperative condition. 29.10 29.11 29.12

g. Describe frequency finding testing, including sweep rates and amplitude used. Provide a summary of frequency finding test results. 29.13 29.14

h. In the event that analysis was used by the Seller to determine the testing input, provide a description of the analytical methods and procedures, including sketches of the mathematical models used. 29.15 29.16

i. Document and discuss all malfunctions that occurred during the test program. 29.17

i. Document and discuss all pertinent operational test and examinations performed before, during, and after the testing program.

SHOP CLEANING

All valves shall be thoroughly cleaned just prior to shipment by hand-cleaning, air-blasting, or detergent-flushing. Cleaning of internal surfaces of carbon steel valves shall be in accordance with the applicable requirements of ANSI N45.2.1 (Class C) and the additional requirements of this specification. These requirements are not mandatory for suppliers of raw materials.

Note: For shop cleaning, only these sections of N45.2.1 specified herein need apply, plus the Definitions of Section 1.4.

Cleaning procedures shall be prepared prior to cleaning. These procedures shall include the applicable item of Section 2.2 of ANSI-N45.2.1, and the requirements specified herein. Cleaning shall be performed in accordance with the prepared procedures. Cleaning procedures shall be approved by the Engineers prior to cleaning.

Parts or subassemblies that will have crevices or inaccessible surfaces after assembly should be cleaned as well as practical before assembly.

Immediately following cleaning with nonvolatile cleaning agents or fluids, rinsing or flushing using Grade III or IV water shall be performed. Final rinsing or flushing shall be with Grade III water.

Drying of noncorrosion-resistant materials shall be done by hand wiping with clean, lint-free cloths (dampened in solvent if desired), except that:

1. Vacuum drying may be used only if provisions are made to ensure that no contaminants can be sucked into the component.

2. Compressed air at room temperature or heated may be used only if it is dry, clean, filtered (unless oilless compressors are used) and completely free of oil.

3. Ambient air circulated electrically, such as by hair dryer-type blowers, need not be filtered.

4. Inert gas purging is acceptable.

After the part has been properly cleaned, tested, dried, and inspected, it shall be immediately protected against contamination and moisture.

Engineering tests (e.g., hydrostatic, performance tests) on components shall be performed using Grade III or IV water. Immediately after draining (i.e., before drying), the affected surfaces shall be flushed or rinsed with Grade III water (unless Grade III water was used for testing).

All surfaces shall be inspected and meet the requirements of Subsection 3.1.3 (Class C) of ANSI-N45.2.1. Weld splatter and sharp or abrupt protrusions from welds and/or castings shall be removed from surfaces that will contact operating fluids and as otherwise required.

In addition, the following shall apply:

External surfaces to be painted shall be prepared in accordance with SHOP PAINTING and therefore need not comply with above criteria.

Thin, uniform rust films are acceptable, except on machined or matted surfaces.

SHOP PAINTING

The Motor Operator shall be supplied with the Manufacturer's standard paint.

All exposed external surfaces of valves shall be coated with a zinc phosphate coating ("parkerized") using the manufacturer's procedure with the following exceptions:

1. Flanged faces
2. Machined weld ends
3. Valve stems
4. Packing glands
5. Adjusting nuts and bolts.

External machined valve surfaces which are not "parkerized" shall be coated as specified in PREPARATION FOR SHIPMENT.

Surface Preparation 31.12

The surfaces to be painted shall be dry abrasive blast cleaned prior to assembly in accordance with SSPC-SP6, "Commercial Blast Cleaning." Precautions shall be taken when sandblasting valve surfaces to prevent damage to vital or moving parts. 31.14 31.15 31.16 31.17

PREPARATION FOR SHIPMENT 31.22

Packaging, handling, and storage prior to shipping and subsequent shipping to the construction site shall be in accordance with Regulatory Guide 1.38 and the requirements specified herein. 31.25 31.27 31.28

When the valve is equipped with an electric actuator, the shipping position shall be such that the motor is in a horizontal position with the limit switch compartment horizontal or vertical up. 31.30 31.31

Items shall be classified in accordance with protection Level C of ANSI N45.2.2. (This level is not to be confused with Cleanliness Class C.) 31.33 31.35

Packaging 31.38

Packaging shall be in accordance with Section 3 of ANSI-N45.2.2, with exceptions and additions noted below, unless otherwise specified. The Seller shall be responsible for assuring that components are adequately protected for the intended shipment and storage conditions, and/or shall provide any special storage instructions for such assurance. Components shall be completely dry prior to packaging. Gate and globe valves must be shipped in the closed position. Procedures shall be prepared in accordance with ANSI N45.2.2 and submitted to the Engineers for record purposes. 31.40 31.41 31.43 31.44 31.45 31.47 31.48 31.49

Any questions whether items may be "subject to detrimental corrosion" (as stated in ANSI-N45.2.2) shall be clarified with the Engineers. Unless otherwise specified, uncoated carbon or low alloy steel or cast iron shall be considered subject to detrimental corrosion and suitably protected. 31.51 31.52 31.53 31.54

The following exceptions, clarifications, and additions shall be made to the ANSI-N45.2.2 requirements: 31.56 31.57

A. Contact Preservatives 32.4

1. Preservatives shall be applied to all exposed machined carbon and low alloy steel and cast iron surfaces which are not painted. 32.6 32.7 32.8

2. Preservatives shall not be applied to interior surfaces of components which will later be exposed to operating fluids. Similarly, item (5) of Appendix A3.4.1 of ANSI-N45.2.2 shall not apply. 32.11 32.12 32.14

3. For springs, threads, or other enclosed surfaces where a light oil type rust preventive is necessary, the material applied shall be "Octoil No. 2883," as manufactured by the Octagon Process Company of Edgewater, New Jersey, or Engineer's approved equal. 32.16 32.17 32.18 32.20

4. For indoor storage, outdoor storage not to exceed 6 months, and where a heavier preservative is needed, a temporary compound having a waxy/greasy consistency and capable of being easily removed with solvents shall be applied. The material shall be "Tectyl 502-C," as manufactured by the Ashland Oil Company of Ashland, Kentucky, or "No-Ox-Id," "A Special," as manufactured by the Dampney Company of Everett, Massachusetts, or Engineer's approved equal. 32.22 32.23 32.24 32.25 32.27 32.28 32.29

5. Where the possibility exists that the rust preventive may come in contact with 300 Series austenitic stainless steel, the preservative shall not be halogenated/chlorinated. 32.31 32.32

6. All contact preservatives shall be capable of being readily removed using nonchlorinated solvents. 32.34 32.35

7. Carbon and low alloy steel openings that are prepared for field welding shall be painted on the machined surface, and to a distance back 2 inches from the end, with one coat of "Deoxaluminite" as manufactured by the Special Chemicals Company of Ossining, New York. 32.37 32.39 32.40 32.41

B. Caps and Plugs 32.44

1. Tack welding, brazing or soldering used to secure metallic plugs or caps is prohibited. 32.46 32.47

2. All component openings shall be adequately plugged, capped, or sealed: 32.50 32.51

a. All bolted openings shall be covered with 1/2-inch minimum thickness of fiberboard or plywood, secured by bolts on opposite 32.53 32.54 32.55

sides of the opening, and further sealed all around with waterproof tapes. 32.56

b. All machined weld-end preparations shall be covered with fitted caps and adequately protected against damage from shipping and handling. For openings less than 6-inch diameter, heavy plastic caps may be used if sealed all around with tape. Openings 6 inches and larger in diameter shall be covered with fiberboard or plywood, secured with tape all around, and then capped with metal or plastic, followed by tape sealing all around. 32.58 33.1 33.2 33.3 33.4 33.5 33.6 33.7

c. Details (sketches, description, etc) of any other special sealing methods (such as may be necessary for nozzles) shall be submitted to the Engineers. 33.9 33.10 33.11

d. The use of only cloth or tape to seal openings is prohibited. 33.13 33.14

e. Painted caps or plugs are prohibited. 33.16

3. Male threads shall be provided with thread protectors. 33.18 33.19

C. Barrier and Wrap Materials 33.21

If polyethylene film is used as a wrap or tarp, it shall be left open enough to allow "breathing" so air inside is not stagnant and, thus, to minimize condensation (since this is not vaporproof barrier material). 33.24 33.25 33.26

D. Desiccants 33.29

Desiccants shall not be used, unless required by the Seller to ensure adequate protection. In the latter case, the Engineers shall be notified in writing that a desiccant must be used (in which case it shall comply with ANSI-N45.2.2). Desiccants and desiccant bag materials that could contact or wash onto austenitic stainless steel or nickel alloys shall not be compounded from or treated with chemical compounds containing chlorides, fluorides, lead, zinc, copper, sulfur, or mercury; nor shall compounds be used which could break down into these substances under heat, irradiation, etc. 33.31 33.33 33.35 33.36 33.37 33.38 33.39 33.40

E. Marking 33.43

The actual shipping weight of each component shall be included in the marking requirements, except for piping and tubing. 33.45 33.46

Handling 33.50

Handling shall meet the requirements of Section 7 of ANSI-N45.2.2. 33.52

Storage 33.56

Storage prior to shipping shall meet the requirements of Section 6 of ANSI-N45.2.2. 33.58

Storage shall be performed in such a manner as to not degrade the cleanliness and/or packaging of items, and so as to minimize corrosion of materials. Noncorrosion-resistant materials and corrosion-resistant materials shall be separated, unless part of the same component, so as not to be in direct contact. 34.3 34.4 34.5

Shipping 34.8

Shipping shall be in accordance with Section 4 of ANSI-N45.2.2. 34.10 34.11

Agreement Prior to Shipping 34.15

The Seller and the Engineer's inspector shall agree in advance exactly how each shipment is to be prepared and which (if any) the inspector is to personally witness to ensure satisfactory preparation. 34.17 34.18 34.20

PROVISION FOR STORAGE 34.25

It is expected that the valves covered by this specification will be stored at the jobsite for several months in a heated building. 34.29 34.30

The storage requirements shall be forwarded to the jobsite with each shipment to which they are applicable. 34.35 34.36

SPARE PARTS 34.40

All spare parts for valves covered by this specification shall comply in all respects with the requirements of this specification, specifically including documentation identical in kind and format to that required for the original equipment or material. However, if the Seller at the time the spare parts order is placed, is aware 34.43 34.44 34.46 34.47 34.48

that an applicable code or regulatory requirement has changed from that delineated in this specification or issued addenda thereto, the Seller shall identify this to the company placing the spare parts order for decision as to which requirement applies.

TOOLS

Special* tools, fixtures, or appurtenances used only during erection shall be furnished on a rental basis.

One complete set of all special tools, fixtures, and appurtenances required for maintenance and operation shall be furnished and marked to identify the equipment intended for use on.

Special tools include the necessary equipment to perform regrinding and lapping of the seat and disc of certain valves after field installation. These valves are specified on the "Motor-Operated Valve Data Sheets" by Engineers under Special Requirements as "Low Seat Leakage."

INSTALLATION AND OPERATING INSTRUCTIONS

At the time indicated in the schedule, the Seller shall submit to the Engineers 40 complete, bound copies of the installation, operation, and maintenance instructions for the equipment he is furnishing.

The Operating Instructions shall be specific regarding the lubricants to be used. Those that will be stocked by Purchaser are as tabulated below. The Seller's designated lubricants shall be from those listed below, unless it is mandatory that some other lubricant be used.

Oils		Grease	
Manufacturer	Identification	Manufacturer	Identification
Mobil	DTE Oil 26	Mobil	Mobilplex 47
Mobil	DTE Oil 103	Mobil	Mobiltemp 78
Mobil	DTE Oil 797	Mobil	Mobiltac D
Mobil	DTE Oil Extra Heavy	Mobil	Mobiltac E
Mobil	Compound BB	Mobil	Sovarex LO
Mobil	Compound DD		
Mobil	Brake Fluid		
Mobil	Mobilarma 798		
Mobil	Delvac 1230		

All final instructions shall be certified by the manufacturer as applicable to the equipment furnished, and

this equipment shall be specifically identified, such as by serial number.

*"Special" shall be defined as anything not normally and usually available in a power station or readily available thereto.

A parts identification list shall be included with each set of instructions. This shall include sectional and/or outline prints or illustrations marked to identify each numbered part and to locate it in relation to the equipment as a whole.

ADVISERS FOR ERECTION AND STARTUP

After receipt of delivery, and if requested by the Engineers, the Seller shall provide one or more qualified, experienced advisers, on a per diem basis, to assist and advise in the installation. The Engineers will advise at least 10 days in advance of the date when such advisers will be required. Such advisers shall report promptly at the time and place designated by the Engineers and shall be assigned to work continuously until released by the Engineers. Working schedule for factory advisers will be determined by the Engineers.

SCHEDULE

A schedule showing the key dates pertaining to this specification is included with the bid documents. This shows the mailing and shipping dates that must be met in accordance with the present project requirements. This schedule, or a revision of it as agreed upon by the Seller and the Engineers before the order is placed and included with the purchase order, shall be binding upon the Seller.

Seller shall provide a detailed documentation and drawing schedule listing all drawings, procedures, reports and other documents that will be furnished and the time when each will be submitted. Listing shall be specific with respect to document title and number.

Seller shall submit a Manufacturing Schedule delineating key manufacturing dates and events so that the Engineers' inspector may visit the Seller's plant at the key dates during the manufacturing process.

EXCLUDED EQUIPMENT LIST

The Nuclear Regulatory Commission (NRC) periodically identifies equipment which they have found to be defective in their inspections of nuclear power plants.

The Purchaser has committed not to use any of the following equipment in safety-related components for Nine Mile Point Nuclear Station - Unit 2. Periodically, as the NRC provides additional information, the list may be modified.

1. Automatic Switch Company (ASCO), Solenoid Valves Series 8300-C, Form RF or RU; or Series 8302-C, Form RF or RU

2. Westinghouse Type OT-2 Switches

3. General Electric Type HFA, HGA, HKA, and HMA Relays with Nylon Coil Spools (or bobbins)

4. General Electric Type STD Relays

5. Westinghouse Type BF (ac) and BFD (dc) Relays

6. Westinghouse Type AR Relays with Latch Attachments

7. ITE Imperial J20 Pneumatic Timing Head (in time delay relays)

8. GE Type CR120A Relays

9. Cutler-Hammer Type M, DC Relays, Catalog No. D23MRD (Mfg dates prior to August 1976)

10. Bergen-Patterson Hydraulic Shock Suppressor Accumulator Spring Coils, Serial Nos. 487,000 to 515,000 and F60,635 to F75,000

11. Westinghouse Type SG 293-B255A20 Relays.

Equipment from the above listing shall not be provided in any safety-related equipment supplied under this specification.

At the time of release for shipment, the Seller shall be required to provide written certification that the equipment listed above, as modified by NRC-initiated changes, and included in this specification by authorized change, are excluded from safety-related components supplied under this specification. In addition, a complete bill of materials, necessary to identify items listed by the NRC as excluded after the time of shipment, shall be provided in accordance with the schedule established by the Engineers. If this specification requires a bill of materials in association with spare parts information, an additional list is not required.

GUARANTEE

The Seller guarantees that the motor-operated valves will perform satisfactorily at their rated temperature/pressure and the conditions specified.

QUALITY ASSURANCE PROGRAM

Quality Assurance Program

Each bidder shall submit with his original proposal one copy of his Quality Assurance Program covering the quality control and quality assurance measures (1) imposed by him on his own work and (2) imposed by him upon subsuppliers or subcontractors. The Program shall be in compliance with the intent of 10CFR50 - Appendix B and with Section III of the ASME Boiler and Pressure Vessel Code. If a bidder has previously submitted his Quality Assurance Program to the Engineers, his proposal shall contain a separate signed document which indicates when his QA Program was submitted and a statement that the program is still being followed as submitted.

A Program acceptable to the Engineers shall be a prerequisite for a Bidder being chosen as Seller.

Quality Assurance Program Audits

The accepted Quality Assurance Program manual of the Seller shall be used in the audit of the program by the Engineers' representatives during the performance of the work specified.

Authorized representatives of the Engineers or of the Purchaser shall be allowed access to the engineering offices, shops, and working areas of the Seller and his subsuppliers at all reasonable times for the purpose of auditing (1) the Seller's accepted Quality Assurance Program and (2) the subsupplier's Quality Assurance Program to the extent that such a Program is required by the Seller's Program. Such audits will include examination of documentary evidence of activities affecting quality and will be carried out on a planned, periodic basis during the course of the work to verify compliance with all aspects of the Program and to determine the effectiveness thereof. The ESI's exercise of, or failure to exercise, his right to inspect, witness, or audit, and any subsequent approval by the ESI, shall not relieve the Seller of his obligation to comply with the terms/conditions of the Purchase Order.

Purchase Order Documents at Production Location 38.14

The Seller shall specifically ensure that a copy of 38.16
this specification, with all addenda thereto, or appropriate 38.17
work instructions which include the specification
requirements are readily available at each of his 38.19
fabricating or production locations where work covered by 38.20
this specification is in progress.

Engineers'/Seller's Quality Assurance Interface 38.23

The Seller is subject to audits, inspections, and 38.25
witnessing by the Engineers' Shop Inspector (ESI) to ensure 38.26
compliance with the requirements of the specification, 38.27
codes, drawings, and Engineers' approved submittals. The 38.29
ESI's exercise of, or failure to exercise, his right to 38.30
inspect, witness, or audit, and any subsequent approval by 38.31
the ESI, shall not relieve the Seller of his obligation to 38.32
comply with the terms/conditions of the purchase 38.33
order/contract.

Certificate of Compliance (COC) 38.36

The S&W QA Certificate of Compliance is a document 38.38
which certifies that the inspection(s) and test(s) required 38.39
by the specification have been satisfactorily completed and 38.41
that the Seller's documentation for that shipment conforms 38.42
to the specification and applicable codes and standards. 38.43
The Certificate of Compliance shall be completed and signed 38.44
by the ESI. 38.45

TESTS 38.49

Nondestructive Examination 38.52

NDE procedures shall be submitted to the Engineers 38.54
for review and approval. Testing shall not be started until 38.56
the Seller has received a copy of his procedures stamped 38.58
"Approved" by the Engineers.

A certified NDE test report shall be prepared and 39.2
shall include in addition to that required by ASME III: 39.3

1. Manufacturer's name 39.6
2. Stone & Webster Purchase Order Number 39.7
3. Name of part and serial number 39.8
4. Procedure and equipment used 39.9
5. Results of examination 39.10
6. Personnel qualification. 39.11

Liquid Penetrant Examination 39.15

The liquid penetrant method shall be in accordance with ASME III and the following additional requirements: 39.17 39.18

1. Water-washable type penetrants shall be used on as-cast, as-forged, or as-welded surfaces. 39.21 39.22

2. Solvent or post-emulsification type penetrants shall be used on machined surfaces. 39.24 39.25

3. Repair areas shall be reexamined by this same method. 39.27 39.28

Magnetic Particle Examination 39.31

Magnetic particle examination shall be in accordance with ASME III and the following additional requirements: 39.33 39.34

1. As-welded or as-forged surfaces shall be examined by the dry particle method. 39.37 39.38

2. Machined surfaces shall be examined using the wet method. 39.40 39.41

3. The magnetizing current shall be direct or rectified alternating current. 39.43 39.44

4. Repair areas shall be examined by the same method. 39.46

Radiographic Examination 39.48

The minimum extent to which the Seller shall apply radiography is to body ends, areas immediately adjacent to body and bonnet flanges, and areas where casting heads have been removed. The Seller shall indicate all areas to be covered on drawings. 39.50 39.51 39.52 39.53 39.54

Radiographic examination shall be in accordance with ASME III and the following additional requirements: 39.56 39.57

1. Type 3 film may be used only with prior approval of the Engineers. 40.1 40.2

2. Repair areas shall be reexamined by this same method. 40.4 40.5

Qualification of NDE Personnel 40.8

All personnel performing nondestructive examination 40.10
shall be qualified and certified in accordance with 40.11
SNT-TC-1A.

NDE Requirements 40.14

Class 1 valves shall be examined in accordance with 40.16
Subsection NB of ASME III. 40.17

Class 2 valves shall be examined in accordance with 40.19
the requirements of Subsection NC of ASME III. 40.20

Class 3 valves shall be examined in accordance with 40.22
the requirements of Subsection ND of ASME III. In addition, 40.23
all weld end preparation shall be examined by PT or MT.

Hydrostatic Tests 40.26

All valves shall be hydrostatically tested by the 40.28
Seller for shell and seat tightness. Shell test shall be 40.29
in accordance with Table NB-3531-9 and NB-6000 for Code
Class 1 valves, NC-6000 for Code Class 2 valves, or ND-6000 40.31
for Code Class 3 valves of ASME III. Seat test shall 40.32
conform to MSS-SP-61 for Code Classes 1, 2, and 3.

The shell tightness test for globe and gate valves 40.34
shall be conducted with the valve open but not back seated. 40.35
Following that, the valve shall be backseated and the 40.36
packing and stuffing box inspected for leakage. 40.37

For globe valves the under-the-seat, hydrostatic 40.39
seat tightness test shall be made at not less than 115 40.40
percent of the maximum differential pressure specified on 40.41
the Motor-Operated Valve Data Sheet by Engineers.

Unless otherwise specified or permitted by the 40.43
applicable Code, tests shall be made after all heat 40.44
treatment and weld repairs have been completed.

Water used for testing shall meet the requirements 40.46
and properties for water specified under SHOP CLEANING. Any 40.48
restrictions under SHOP CLEANING for water to be used when
crevices or inaccessible areas are present, shall also apply 40.49
for testing.

Final rinsing of items, as required under SHOP 40.51
CLEANING, may be performed after testing.

Immediately following tests, all water shall be drained from the item. Drying shall comply with the requirements specified under SHOP CLEANING. 40.53 40.54

Noncorrosion-resistant castings, forgings, and/or welds shall not be painted prior to testing. 40.56

For ferritic steel items, consideration shall be given to the grade of material, test water and metal temperature, wall thickness, local stresses, and any applicable code requirements to minimize the possibility of brittle fracture. 40.58 41.1 41.2

After hydrostatic tests, but not before Performance Tests, valves shall have wet packing removed and all interior surface dried. The finished valve shall be shipped with the stem packing removed. A new packing set together with the Purchaser's Mark Number shall be sealed in a weatherproof bag and shipped with the valve. The Purchaser's mark number shall also be marked on the outside of the weatherproof bag. A shipping collar shall be inserted in the stuffing box prior to shipment to protect the valve stem. 41.5 41.6 41.7 41.8 41.9 41.10 41.11

Pneumatic Seat Leakage Test 41.14

All valves noted as "Low Seat Leakage" on the Motor-Operated Valve Data Sheet by Engineers under Special Requirements shall have a pneumatic test performed on the valve seat. The pneumatic seat test shall be in accordance with MSS-SP-61 with the following additions or exceptions: 41.16 41.17 41.19 41.20 41.21

1. The maximum permissable leakage rate for each seat shall be 1/10 of a standard cubic foot of air per hour per inch of diameter of port size. 41.23 41.24 41.25

2. If pneumatic seat test is performed after the hydrostatic test, the valve internal and seat shall be completely dry. 41.27 41.28

3. The pneumatic test pressure and medium shall be 45 psig, clean, dry air or nitrogen and the test duration shall be a minimum of 15 minutes (more if required to realize meaningful results.) 41.30 41.31 41.32

4. The pneumatic seat leakage test shall be performed after the valve has been cycled (opened and closed) by the motor operator utilizing minimum terminal voltage specified under MOTOR OPERATORS. No additional forces or torques may be applied to the valve or motor operator to assist in seating prior to and during testing. 41.34 41.35 41.37 41.38

5. Test pressure shall be applied successively to each side of the closed gate. Application of test pressure through the body or bonnet for the purpose of testing both gates simultaneously is not permitted.

6. Pneumatic seat leakage procedures shall be submitted to the Engineers for approval prior to commencement of testing.

Motor Tests

The following routine tests shall be performed on each motor in accordance with NEMA Standard MG1 Section 12.51 for type of test and the following sections of IEEE Standard No. 112A, for method of test.

Locked rotor current input at rated or reduced voltage (Section 4.8)

Dielectric test (Section 6.2)

Motor Operator Tests

The following production tests shall be performed on each completed motor operator by the motor operator manufacturer prior to shipment to the valve manufacturer. Tests shall be in accordance with manufacturer's written procedures which shall be submitted to the Engineers for approval prior to testing.

1. Thrust/Torque Test - Test to determine that the actual thrust and torque meets the motor operator specification and to determine the calibration of the torque limiting devices. Test shall be performed for the maximum and minimum terminal voltage specified under MOTOR OPERATORS.

2. Stalled Thrust/Torque Test - Test to verify the ability of the motor operator to sustain the output thrust/torque with the electrical thrust/torque limiting devices negated, and at the maximum terminal voltage specified under MOTOR OPERATORS.

Performance Tests

The Seller's performance test shall be performed on each assembled motor-operated valve using both motor operator and handwheel through at least three cycles. One cycle shall consist of seating and unseating the valve against maximum differential pressure at minimum terminal voltage; the valve shall open and close within the specified

operating time. Performance tests shall be conducted after successful hydrostatic test and without further adjustment to the packing. The operating voltage and amps shall be recorded, and the torque switch settings shall be verified.

INSPECTION

As used herein, the term "Engineers' Shop Inspector" means the Engineers' employee assigned to do inspection work or auditing in the manufacturer's shops.

Authorized Shop Inspectors or other representatives of the Engineers or of the Purchaser shall be allowed access to the engineering offices, shops, and working areas of the Seller and his subsuppliers at all reasonable times. These personnel shall have the right to such information as is necessary to demonstrate that engineering, procurement, and production are proceeding in accordance with the established schedules. They shall also have the right to inspect the material or equipment, or the Seller's or subsupplier's production and inspection procedures, to confirm that the requirements of this specification are being complied with. The Seller or subsupplier shall provide all tools, instruments, scaffolding, etc, necessary to facilitate these inspections.

The Seller shall cooperate with the Engineers' Shop Inspector in establishing when the various inspections or tests will be performed during manufacture, testing, cleaning, and preparation for shipment. The Engineers' Shop Inspector shall designate which of these he is required to witness or participate in, and the Seller shall furnish an agreed-upon amount of notification prior to the start of each.

The Engineers' Shop Inspector shall:

a. Stop Work Action

The Engineers' Shop Inspector (ESI) will orally notify and confirm in writing to the Seller of any situation where, in the judgment of the ESI, the Seller or Seller's suppliers are performing work contrary to the conditions and terms of the procurement documents, or where continued operations could cause damage, preclude further operations, or render remedial action ineffective for any product form/service provided by the Seller or Seller's suppliers.

If, after this notification by the ESI, the Seller does not commence appropriate corrective action to

the satisfaction of the ESI, the ESI, by acting through channels previously established by the Engineers, shall initiate stop work action on the specified product form/services and so notify the Seller in writing.

Upon receipt of a Stop Work Directive (SWD) from the Engineers, the Seller and the Seller's suppliers shall cease operations, including shipments, on any specified product form/service to the extent stipulated by the SWD. Resumption of operations shall not be undertaken until the Seller has obtained a written authorization from the Engineers. The written authorization to resume further operations shall only be granted upon approval of the Seller's written commitment to correct those conditions itemized on the SWD.

b. At the appropriate time, witness or conduct the various inspections, tests, verifications, etc, as indicated on the enclosed Shop T.I.D. Report, and indicate that each is in conformance with the requirements of this specification.

c. Sign and date a completed S&W QA Certificate of Compliance as a written release for shipment.

It shall be the Seller's responsibility that NO shipment is made to the jobsite until the S&W QA Certificate of Compliance has been approved and signed by the Engineers' Shop Inspector. Failure of the Seller to comply with this requirement may be cause for rejection at the jobsite, with the material returned to the factory, and with all additional freight expense for the Seller's account.

It is not intended that the Engineers' shop inspection shall relieve the Seller in any way whatsoever of his obligation to maintain an adequate test, inspection, and documentation program of his own or of any other obligation under this specification. Furthermore, the fact that the Engineers' Shop Inspector may inadvertently overlook a deviation from some requirement of this specification shall not constitute a waiver of that requirement, or of the Seller's obligation to correct the condition when it is discovered, or of any other obligation under this specification.

To the extent that approval of certain drawings or procedures by the Engineers is required by this specification:

a. No procurement of material or production work where the indicated drawings or procedures are used shall be started until the Engineers' approval has been attained. 44.4 44.5

b. All work shall be in accordance with the approved drawings or procedures. 44.7 44.8

Failure to comply with this requirement will be cause for rejection of the work by the Engineers' Shop Inspector. 44.11 44.12

The specific duties assigned to the Engineers' Shop Inspector are as follows: 44.14 44.15

1. Welding Procedures 44.18

Verify that the welding procedures and their qualifications have been approved by the Engineers prior to the start of manufacturing and are being followed as required under WELDING. 44.20 44.21

2. NDE Procedures 44.24

Verify that all NDE Procedures that are to be used have been stamped "Approved" by the Engineers prior to examination as required under TESTS. 44.26 44.27

3. Heat Treatment Procedures 44.30

Verify that all heat treatment procedures that are to be used have been stamped "Approved" by the Engineers prior to the start of manufacturing as required under TECHNICAL REQUIREMENTS. 44.32 44.33 44.35

4. Wall Thickness Measurement Procedure 44.38

Verify that the wall thickness measurements procedure that is to be used has been stamped "Approved" by the Engineers, as required under VALVE MINIMUM WALL THICKNESS. 44.40 44.41 44.43

5. Shop Cleaning Procedures 44.46

Verify that procedures to be used have been stamped "Approved" by the Engineers as required under SHOP CLEANING. 44.48 44.49 44.50

6. Packaging and Shipping Procedure 44.54

Verify that procedures are as required under PREPARATION FOR SHIPMENT, have been issued to the Engineers, and are on file. 44.56 44.57 44.58

7. Pneumatic Seat Leakage Test Procedure 45.3

Verify that the pneumatic seat leakage test procedure that is to be used has been stamped "Approved" by the Engineers as required under TESTS. 45.5 45.6 45.7

8. Motor Operator Test Procedure 45.11

Verify that the motor operator test procedure that is to be used has been stamped "Approved" by the Engineers as required under TESTS. 45.14 45.16 45.17

9. Welder Qualifications 45.20

Verify that all welders working on the equipment are qualified as required under WELDING. 45.22 45.23

10. NDE Personnel Qualifications 45.26

Verify that NDE personnel are qualified for the work being performed, prior to examination, as required under TESTS. 45.28 45.29

11. Certified Material Test Reports for Pressure Retaining Parts 45.33 45.34

Verify that the Certified Material Test Reports, including weld filler metal and impact test records were applicable, for material used in manufacture are in conformance with this specification as required under MATERIALS. In addition, where welding has been performed, verify that the work was performed, heat treated, and examined in accordance with ASME III and the applicable material specification. 45.37 45.38 45.40 45.41 45.42 45.43 45.44

12. Stress Reports 45.47

Verify that the stress reports have been stamped "Approved" by the Engineers on all Class 1 valves, as required under TECHNICAL REQUIREMENTS. 45.49 45.50 45.52

13. Visual Inspection 45.55

Perform a visual inspection on all motor-operated valves for conformance to the specification and to "Approved" manufacturer's drawings, prior to painting, as required under TECHNICAL REQUIREMENTS. 45.57 45.58

14. Dimensional Check 46.5

Witness, on a sample basis, but not less than 25 percent, the dimensional check of motor-operated valves by the Seller's inspector, and verify that the Seller's inspector has recorded or checked the following as-built dimensions and that they conform to the manufacturer's drawing requirements as required under TECHNICAL REQUIREMENTS: 46.7 46.8 46.10 46.11 46.12

a. Overall length 46.15
b. Height 46.17
c. End dimensions 46.20
d. Operator dimensions and orientation. 46.22

15. Wall Thickness Measurement Documentation 46.25

Verify Seller's valve wall thickness documentation to ensure that thickness measurements of finished valves meet the requirements of ASME III, as required under VALVE MINIMUM WALL THICKNESS. 46.27 46.28 46.30

16. NDE Reports 46.33

Verify that Seller's records of required NDE reports have been completed and are satisfactory as required under TESTS. PT and MT inspections are to be on an audit basis. 46.35 46.36 46.37

17. Radiographic Films and Records 46.40

Perform a review of all RT film and records as required under TESTS. 46.42 46.43

18. Heat Treatment Records 46.46

Verify that Seller's records of required heat treatment have been completed and are satisfactory as required under TECHNICAL REQUIREMENTS. 46.48 46.49

19. Hydrostatic Shell Tests 46.53

Witness a sufficient number, but not less than 25 percent, of hydrostatic shell tests of each type and size valve to ensure the acceptability of the assembled valves as required under TESTS. 46.55 46.56 46.58

20. Hydrostatic Seat Tests 47.3

Witness a sufficient number, but not less than 25 percent, of hydrostatic seat tests of each type and size to ensure the acceptability of valves as required under TESTS. 47.5 47.6

21. Performance Tests 47.9

Witness three performance tests of each assembled valve and motor operator, running the valve from full-closed to full-open position and back for each of the three cycles to demonstrate compliance with performance requirements as required under TESTS. A record of operating voltage and amps and verification of torque switch settings is required. 47.11 47.12 47.13 47.14 47.15

22. Dielectric Test 47.18

Verify that dielectric test has been performed as required. Refer to TESTS. 47.20 47.21

23. Locked Rotor Test 47.25

Verify that locked rotor test has been performed as required. Refer to TESTS. 47.27 47.28

24. Pneumatic Seat Leakage Test 47.32

Witness each pneumatic seat leakage test to ensure the acceptability of the assembled valve. Refer to TESTS. 47.34 47.36

25. Thrust/Torque Test 47.40

Witness a sufficient number, but not less than 25 percent, of thrust/torque tests to ensure the acceptability of the motor operator. Refer to TESTS. 47.42 47.43 47.44

26. Stalled Thrust/Torque Test 47.48

Witness a sufficient number, but not less than 25 percent, of stalled thrust/ torque tests to ensure the acceptability of the motor operator. Refer to TESTS. 47.50 47.51 47.52

27. Seismic Certificate of Compliance 47.56

Verify that the Seismic Certificates of Compliance meet the requirements of this specification as required under SEISMIC REQUIREMENTS. 47.58 48.1 48.2

28. Manufacturer's Motor Operator Prototype Test Data Report 48.6 48.8

Verify that the Manufacturer has submitted his Prototype Test Data Report and that it is complete and satisfactory as required under MOTOR OPERATORS. 48.10 48.11

29. Motor Operator Sizing Calculation 48.13

Verify that the Seller has sent copies of the calculation for sizing each motor operator to the Engineers. Refer to MOTOR OPERATORS section. 48.15 48.16 48.18

30. Seismic Calculations 48.21

Verify that the Seller has submitted copies of the seismic calculations to the Engineers as required under SEISMIC REQUIREMENTS. 48.24 48.26 48.27

31. Seismic Test 48.30

Witness each seismic test (if required) to ensure acceptability as required under the SEISMIC TESTING portion of SEISMIC REQUIREMENTS. 48.32 48.33 48.34

32. Operability Test 48.38

Witness each operability test (if required) to ensure acceptability as required under the OPERABILITY TESTING portion of SEISMIC REQUIREMENTS. 48.40 48.41 48.42

33. Cleanliness Examination 48.46

Verify that cleaning is performed as required under SHOP CLEANING. 48.48 48.49

34. Shop Painting 48.53

Verify that valves are "parkerized" and operators are painted as required under SHOP PAINTING. 48.55 48.56

35. Marking 49.1

Verify that valves and operators are marked as required under MARKING. 49.3 49.4

36. Packaging and Shipping 49.7

Verify that packaging and shipping are as required under PREPARATION FOR SHIPMENT. 49.9 49.10

37. Records and Certifications for PREPARATION FOR SHIPMENT 49.15 49.16

Verify that records and certifications are on file and are as required under PREPARATION FOR SHIPMENT. 49.19 49.20

38. Manufacturer's Data Report 49.24

Verify that the manufacturer's data report has been properly filled out by the manufacturer and signed by the Authorized Code Inspector, as required under TECHNICAL REQUIREMENTS. 49.26 49.27 49.28

39. Final Documentation Audit 49.31

Perform an audit of Seller's documentation package to ascertain that all required records are complete, as required under DOCUMENTATION. 49.33 49.34 49.36

40. Documentation Checklist 49.40

Verify that the Documentation Checklist has been approved and is included with the shipment, as required under DOCUMENTATION. 49.42 49.43

41. Stem Nut Locknuts 49.47

Verify that the stem nut locknuts on all motor-operated valves are secured properly by means of staking or other acceptable means. 49.49 49.50

42. Shipping Release 49.54

Perform signoff of the S&W Certificate of Compliance after all documentation and materials have been verified to be in accordance with the specification requirements. 49.56 49.57

DOCUMENTATION 50.4

Documentation by Seller 50.7

The basic documentation required of the Seller shall include all test reports, data sheets, and certificates which are required by any of the applicable codes, and state and local authorities. These shall include, but not by way of limitation, the following: 50.9 50.10 50.12 50.13

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Welding Procedures	4	-	-	1	-	50.17 50.18 50.20
Welding Procedure Qualifications	4	-	-	1	-	50.32 50.33
Welder Qualifications	-	-	-	1	-	50.35
Heat Treatment Procedures	4	-	-	1	-	50.38 50.39
Heat Treatment Records	-	2	-	1	-	50.42
NDE Procedures	4	-	-	1	-	50.44
NDE Personnel Qualifications	-	-	-	1	-	50.48 50.49
Certified Material Test Reports for Pressure-Retaining Parts (Including Impact Tests & Weld Filler Metal)	-	2	-	1	-	50.52 50.53 50.54 50.55 50.56
Certified NDE Reports	-	2	-	1	-	50.58
Certified Stress Reports (Class 1 only)	4	2	-	1	-	51.2 51.3
Radiographic Film	-	-	-	1	-	51.5
Hydrostatic Shell Test Reports	-	2	-	1	-	51.7 51.8
Hydrostatic Seat Test Reports	-	2	-	1	-	51.11 51.12
Dielectric Test Reports	4	2	-	1	1	51.15
Locked Rotor Test						51.17

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Reports	4	2	-	1	1	51.18
Performance Test Report (including operating volts and amps)	4	2	-	1	-	51.20 51.21 51.22
Seismic Certificate of Compliance	4	2	-	1	-	51.24 51.25
Motor Operator Prototype Test Data Report	4	2	-	1	-	51.27 51.28
Motor Operator Test Procedure	4	-	-	1	-	51.30 51.31
Pneumatic Seat Leakage Test Procedure	4	-	-	1	1	51.33 51.34
Pneumatic Seat Leakage Test Reports	4	2	-	1	1	51.36 51.37
Thrust/Torque Test Reports	4	2	-	1	1	51.39 51.40
Stalled Thrust/Torque Test Reports	4	2	-	1	1	51.42 51.43
Motor Operator Sizing Calculation	4	-	-	1	1	51.45 51.46
Seismic Calculation	4	-	-	1	1	51.48
Seismic Testing Test Report	4	-	-	1	-	51.50 51.51
Operability Testing Test Report	4	2	-	1	-	51.53 51.54
Dimensional Check Documentation	-	2	-	1	-	51.56 51.57
Wall Thickness Measurement Procedure	4	-	-	1	-	52.2 52.3
Wall Thickness Measurement Documentation	-	2	-	1	1	52.7 52.8
Shop Cleaning Procedures	4	-	-	1	-	52.11 52.12

Title	Distribution and No. of Copies EPE	ESI	Mail	MF	S	
Packaging and Shipping Procedure	4	-	-	1	-	52.14 52.15
Records for Preparation for Shipment (in accordance with Section 8 of ANSI-N45.2.2)	-	2	-	1	-	52.17 52.18 52.19 52.20 52.21
Storage Requirements	4	-	-	1	1	52.23 52.24
Documentation Checklist	4	2	-	1	-	52.27
Manufacturer's Data Reports	-	2	-	1	1	52.30 52.31

EPE - Engineers' Project Engineer - to be submitted in accordance with CORRESPONDENCE paragraph. 52.38 52.39
ESI - Engineers' Shop Inspector - to be submitted as arranged by ESI 52.42 52.43
Mail - Mail or express by the Seller to the jobsite, at the time of shipment. Address to be given by the ESI. Detailed identification of contents and proof of shipment to be retained by the Seller, available to the ESI. 52.46 52.47 52.48 52.49 52.50
MF - Manufacturer's file, available to the ESI 52.52
S - With the shipment to which applicable 52.53

Records System 52.57

A records system shall be established and maintained to provide documentary evidence of the quality of items and activities affecting quality. The Quality Assurance (QA) records shall include results of reviews, inspections, tests, audits, monitoring of work performance, and material analyses. Records shall, as a minimum, identify the inspector or data recorder, date inspection was performed, type of observation, procedures used, results, acceptability, and action taken with deficiencies noted. Additional records on supporting data shall also be maintained. All quality verification records, procedures, and qualifications shall be identifiable to the item or activity involved. These records shall be retrievable and available for examination. 53.1 53.2 53.3 53.4 53.5 53.6 53.7 53.8 53.9 53.10 53.11

Documentation Checklist 53.13

Prior to the start of fabrication, prepare and submit to the Engineers, for review and approval, a preliminary Documentation Checklist detailing the Quality Assurance documents which will be required to comply with this specification and referenced codes and standards. This checklist shall itemize by document type, for each component or part, documents that will be submitted to the Engineers for information or approval and records which will document the results of operations, inspections, and tests. Upon completion of equipment fabrication, testing, and inspection, but prior to release for shipment, the checklist shall be finalized to show the drawings and procedures actually used and the records which document the results of all inspections and tests performed. The final Documentation Checklist shall be verified for accuracy and completeness and submitted to the ESI.

Document Submittals

This specification requires specific documents to be formally submitted to the Engineers for information, approval, or approval with subsequent certification. When required by this specification, those documents generated by the Seller's suppliers shall also be submitted. Prior to submittal to the Engineers, the Seller shall review them for conformance to requirements and note his approval on the face of the documents. Revisions to documents after Engineers' approval of same shall require that the revised documents be resubmitted for approval.

Sellers' Documentation

QA documents are a deliverable item. The Seller's QC representative shall approve them, then present them to the ESI. The Seller shall assemble all QA records. Each document submitted shall be clearly identified by the Purchaser's name, the station and unit, the Purchase Order numbers, the equipment description and specific identification, and the manufacturer's name and address. Each individual document shall be legible and shall have reproducible microform capability. No information shall be recorded closer than 5/8 inch to the binding edge or closer than 1/4 inch to any other edge of the paper.

Documents that have been submitted with a previous shipment shall not be duplicated. However, a statement shall be furnished to the ESI itemizing, by document, the documents previously furnished for each item of equipment and the date of that previous submittal.

Documentation to be transmitted with a shipment, after review by the ESI, shall be adequately packaged,

protected, and secured so as to ensure that it will arrive with the shipment in an undamaged condition. 53.44

Final Inspection and Check of Records 53.46

The Seller shall be responsible for inspecting the item(s) and checking the applicable records, prior to shipment, to verify that all specification requirements have been complied with. Two complete sets of all documents required for ESI shall be submitted to the ESI. Acceptance of the completed sets of records does not relieve the Seller of responsibility for compliance with specification requirements. 53.48 53.49 53.50 53.51 53.52

Shipping Release 53.54

No shipments shall be made without inspection and/or written release from the ESI. The S&W QA Certificate of Compliance, when approved and signed by the ESI, will constitute this written release. These requirements also apply to shipments from the Seller's suppliers when item(s) are to be shipped to S&W or its Clients. 53.56 53.57 53.58 54.1

Documentation by the ESI 54.3

The Shop T.I.D. form included with this specification and the signed and dated S&W Certificate of Compliance comprise the specific documentation required of the Engineers' inspector. 54.5 54.6

This T.I.D. form is not meant to limit the additional tests, inspections, or documentation required by the specified codes or normally provided by the Seller. 54.7 54.8

1-63A

STONE & WEBSTER ENGINEERING CORPORATION

SHOP

T.I.D. REPORT FOR MOTOR - OPERATED CARBON STEEL VALVES, CATEGORY I

040 488 (QCD-101) ☐ REPORT NO. _____ ☐ FINAL REPORT SHEET 1 OF 2

CLIENT: NIAGARA MOHAWK POWER CORPORATION	JO NO: 12177	MARK NO:
PROJECT: NINE MILE POINT NUCLEAR STATION - UNIT 2	ORDER NO: NMP2 - P304R	ITEM NO:
SELLER OR CONTRACTOR: VELAN ENGINEERING COMPANIES	SHOP ORDER NO:	
SUBSUPPLIER OR SUBCONTRACTOR:	SHOP NO:	
DESCRIPTION:	SELLER OR CONTRACTOR'S IDENTIFICATION:	
REFERENCE: ASME SECTION III, Class 1		
S & W SPECIFICATION NAME: MOTOR - OPERATED CARBON STEEL VALVES	SPECIFICATION DATE:	ADDENDA THRU NO:

	TEST, INSPECTION, AND DOCUMENTATION RECORD	*	VERIFIED**	WITNESSED**	PERFORMED**	CERTIFIED*** BY (Signature)	CERTIFIED*** DATE	DEVIATION AUTHORIZATION TYPE	DEVIATION AUTHORIZATION NUMBER OR NAME	DEVIATION AUTHORIZATION DATE
1	Welding Procedures	1	x							
2	NDE Procedures	2	x							
3	Heat Treatment Procedures	3	x							
4	Wall Thickness Measurement Procedure	4	x							
5	Shop Cleaning Procedures	5	x							
6	Packaging and Shipping Procedure	6	x							
7	Pneumatic Seat Leakage Test									
8	Procedure	7	x							
9	Motor Operator Test Procedure	8	x							
10	Welder Qualifications	9	x							
11	NDE Personnel Qualifications	10	x							
12	Certified Material Test Reports for									
13	Pressure Retaining Parts	11	x							
14	Stress Reports	12	x							
15	Visual Inspection	13			x					
16	Dimensional Check	14		x						
17	Wall Thickness Measurement									
18	Documentation	15	x							
19	NDE Reports	16	x							
20	Radiographic Films and Records	17			x					
21	Heat Treatment Records	18	x							
22	Hydrostatic Shell Tests	19		x						
23	Hydrostatic Seat Tests	20		x						
24	Performance Tests	21		x						
25	Dielectric Test	22	x							

*FOR INSTRUCTIONS, SEE THIS NUMBER IN THE INSPECTION SUBSECTION
**BY S & W INSPECTOR IF FILLED IN "X"
VERIFIED — PERSONAL OBSERVATION OF DATA APPLICABLE TO THE WORK
WITNESSED — PERSONAL OBSERVATION WHILE THE MANUFACTURER PERFORMS THE TASK
PERFORMED — PERSONAL PERFORMANCE OF THE TASK
***AS IN CONFORMANCE WITH THE SPECIFICATION OR WITH THE DEVIATION AUTHORIZATION INDICATED

REMARKS

OFFICE	REPORTED BY (SIGNED IF FINAL)	DATE

1-63B

STONE & WEBSTER ENGINEERING CORPORATION

SHOP

T.I.D. REPORT FOR MOTOR - OPERATED CARBON STEEL VALVES, CATEGORY I

W 0488 (QCD-1011) ☐ REPORT NO _____ ☐ FINAL REPORT SHEET 2 OF 2

PURCHASER NIAGARA MOHAWK POWER CORPORATION	JO NO 12177	MARK NO
PROJECT NINE MILE POINT NUCLEAR STATION - UNIT 2	ORDER NO NMP2 - P304R	ITEM NO
SELLER OR CONTRACTOR VELAN ENGINEERING COMPANIES	SHOP ORDER NO	
SUBSUPPLIER OR SUBCONTRACTOR	SHOP NO	
DESCRIPTION	SELLER OR CONTRACTOR'S IDENTIFICATION	
REFERENCE ASME SECTION III, Class 1		
S & W SPECIFICATION NAME MOTOR - OPERATED CARBON STEEL VALVES	SPECIFICATION DATE	ADDENDA THRU NO

	TEST, INSPECTION, AND DOCUMENTATION RECORD		VERIFIED**	WITNESSED**	PERFORMED**	CERTIFIED*** BY (Signature)	CERTIFIED*** DATE	DEVIATION AUTHORIZATION TYPE	DEVIATION AUTHORIZATION NUMBER OR NAME	DEVIATION AUTHORIZATION DATE
1	Locked Rotor Test	23	x							
2	Pneumatic Seat Leakage Test	24		x						
3	Thrust/Torque Test	25		x						
4	Stalled Thrust/Torque Test	26		x						
5	Seismic Certificate of Compliance	27	x							
6	Manufacturer's Motor Operator Proto-									
7	type Test Data Report	28	x							
8	Motor Operator Sizing Calculations	29	x							
9	Seismic Calculations	30	x							
10	Seismic Test	31		x						
11	Operability Test	32		x						
12	Cleanliness Examination	33	x							
13	Shop Painting	34	x							
14	Marking	35	x							
15	Packaging and Shipping	36	x							
16	Records and Certifications for									
17	PREPARATION FOR SHIPMENT	37	x							
18	Manufacturer's Data Report	38	x							
19	Final Documentation Audit	39			x					
20	Documentation Check List	40	x							
21	STEM NUT LOCKNUTS	41	X							
22	SHIPPING RELEASE	42			X					
23										
24										
25										

*FOR INSTRUCTIONS, SEE THIS NUMBER IN THE INSPECTION SUBSECTION
**BY S & W INSPECTOR IF FILLED IN "X"
VERIFIED — PERSONAL OBSERVATION OF DATA APPLICABLE TO THE WORK
WITNESSED — PERSONAL OBSERVATION WHILE THE MANUFACTURER PERFORMS THE TASK.
PERFORMED — PERSONAL PERFORMANCE OF THE TASK
***AS IN CONFORMANCE WITH THE SPECIFICATION OR WITH THE DEVIATION AUTHORIZATION INDICATED

REMARKS

OFFICE	REPORTED BY (SIGNED IF FINAL)	DATE

1-64A

STONE & WEBSTER ENGINEERING CORPORATION

SHOP

T.I.D. REPORT FOR MOTOR - OPERATED CARBON STEEL VALVES, CATEGORY I

488 (OCO-1011) ☐ REPORT NO _____ ☐ FINAL REPORT SHEET 1 OF 2

NIAGARA MOHAWK POWER CORPORATION	JO NO 12177	MARK NO
PROJECT NINE MILE POINT NUCLEAR STATION - UNIT 2	ORDER NO NMP2 - P3043	ITEM NO
SELLER OR CONTRACTOR VELAN ENGINEERING COMPANIES	SHOP ORDER NO	
SUBSUPPLIER OR SUBCONTRACTOR	SHOP NO	
DESCRIPTION	SELLER OR CONTRACTOR'S IDENTIFICATION	
REFERENCE DRAWINGS ASME SECTION III, Class 2		
S & W SPECIFICATION NAME MOTOR - OPERATED CARBON STEEL VALVES	SPECIFICATION DATE	ADDENDA THRU NO

	TEST, INSPECTION, AND DOCUMENTATION RECORD	*	VERIFIED**	WITNESSED**	PERFORMED**	CERTIFIED*** BY (Signature)	CERTIFIED*** DATE	DEVIATION AUTHORIZATION TYPE	DEVIATION AUTHORIZATION NUMBER OR NAME	DEVIATION AUTHORIZATION DATE
1	Welding Procedures	1	x							
2	NDE Procedures	2	x							
3	Heat Treatment Procedures	3	x							
4	Wall Thickness Measurement Procedure	4	x							
5	Shop Cleaning Procedures	5	x							
6	Packaging and Shipping Procedure	6	x							
7	Pneumatic Seat Leakage Test									
8	Procedure	7	x							
9	Motor Operator Test Procedure	8	x							
10	Welder Qualifications	9	x							
11	NDE Personnel Qualifications	10	x							
12	Certified Material Test Reports for									
13	Pressure Retaining Parts	11	x							
14										
15	Visual Inspection	13			x					
16	Dimensional Check	14		x						
17	Wall Thickness Measurement									
18	Documentation	15	x							
19	NDE Reports	16	x							
20	Radiographic Films and Records	17			x					
21	Heat Treatment Records	18	x							
22	Hydrostatic Shell Tests	19		x						
23	Hydrostatic Seat Tests	20		x						
24	Performance Tests	21		x						
25	Dielectric Test	22	x							

*FOR INSTRUCTIONS, SEE THIS NUMBER IN THE INSPECTION SUBSECTION.
**BY S & W INSPECTOR IF FILLED IN "X"
VERIFIED — PERSONAL OBSERVATION OF DATA APPLICABLE TO THE WORK
WITNESSED — PERSONAL OBSERVATION WHILE THE MANUFACTURER PERFORMS THE TASK
PERFORMED — PERSONAL PERFORMANCE OF THE TASK
***AS IN CONFORMANCE WITH THE SPECIFICATION OR WITH THE DEVIATION AUTHORIZATION INDICATED

REMARKS

REMARKS | REPORTED BY | DATE

1-64B

STONE & WEBSTER ENGINEERING CORPORATION

SHOP

T.I.D. REPORT FOR MOTOR - OPERATED CARBON STEEL VALVES, CATEGORY I

5040 488 (QCD-1011) ☐ REPORT NO. _____ ☐ FINAL REPORT SHEET 2 OF 2

CLIENT: NIAGARA MOHAWK POWER CORPORATION	JO NO: 12177	MARK NO:
PROJECT: NINE MILE POINT NUCLEAR STATION - UNIT 2	ORDER NO: 1442 - P304R	ITEM NO:
SELLER OR CONTRACTOR: BECHTEL ENGINEERING COMPANIES	SHOP ORDER NO:	
SUBSUPPLIER OR SUBCONTRACTOR:	SHOP NO:	
DESCRIPTION:	SELLER OR CONTRACTOR'S IDENTIFICATION:	
REFERENCE: ASME SECTION III, Class 2		
S & W SPECIFICATION NAME: MOTOR - OPERATED CARBON STEEL VALVES	SPECIFICATION DATE:	ADDENDA THRU NO:

	TEST, INSPECTION, AND DOCUMENTATION RECORD	*	VERIFIED**	WITNESSED**	PERFORMED**	CERTIFIED*** BY (Signature)	CERTIFIED*** DATE	DEVIATION AUTHORIZATION TYPE	DEVIATION AUTHORIZATION NUMBER OR NAME	DEVIATION AUTHORIZATION DATE
1	Locked Rotor Test	23	x							
2	Pneumatic Seat Leakage Test	24		x						
3	Thrust/Torque Test	25		x						
4	Stalled Thrust/Torque Test	26		x						
5	Seismic Certificate of Compliance	27	x							
6	Manufacturer's Motor Operator Proto-									
7	type Test Data Report	28	x							
8	Motor Operator Sizing Calculations	29	x							
9	Seismic Calculations	30	x							
10	Seismic Test	31		x						
11	Operability Test	32		x						
12	Cleanliness Examination	33	x							
13	Shop Painting	34	x							
14	Marking	35	x							
15	Packaging and Shipping	36	x							
16	Records and Certifications for									
17	PREPARATION FOR SHIPMENT	37	x							
18	Manufacturer's Data Report	38	x							
19	Final Documentation Audit	39			x					
20	Documentation Check List	40	x							
21	STEM NUT LOCKNUTS	41	X							
22	SHIPPING RELEASE	42			X					
23										
24										
25										

*FOR INSTRUCTIONS, SEE THIS NUMBER IN THE INSPECTION SUBSECTION

**BY S & W INSPECTOR IF FILLED IN "X".
VERIFIED — PERSONAL OBSERVATION OF DATA APPLICABLE TO THE WORK
WITNESSED — PERSONAL OBSERVATION WHILE THE MANUFACTURER PERFORMS THE TASK
PERFORMED — PERSONAL PERFORMANCE OF THE TASK

***AS IN CONFORMANCE WITH THE SPECIFICATION OR WITH THE DEVIATION AUTHORIZATION INDICATED.

REMARKS

OFFICE | REPORTED BY | DATE

1-65A

STONE & WEBSTER ENGINEERING CORPORATION

SHOP

T.I.D. REPORT FOR MOTOR - OPERATED CARBON STEEL VALVES, CATEGORY I

040 488 (OCD-101) ☐ REPORT NO. _____ ☐ FINAL REPORT SHEET 1 OF 2

CLIENT NIAGARA MOHAWK POWER CORPORATION	JO NO 12177	MARK NO
PROJECT NINE MILE POINT NUCLEAR STATION - UNIT 2	ORDER NO NMP2 - P304R	ITEM NO
SELLER OR CONTRACTOR VELAN ENGINEERING COMPANIES	SHOP ORDER NO	
SUBSUPPLIER OR SUBCONTRACTOR	SHOP NO	
DESCRIPTION	SELLER OR CONTRACTOR'S IDENTIFICATION	
REFERENCE ASME SECTION III, Class 3		
S & W SPECIFICATION NAME MOTOR - OPERATED CARBON STEEL VALVES	SPECIFICATION DATE	ADDENDA THRU NO

	TEST, INSPECTION, AND DOCUMENTATION RECORD	*	VERIFIED**	WITNESSED**	PERFORMED**	CERTIFIED*** BY (Signature)	CERTIFIED*** DATE	DEVIATION AUTHORIZATION TYPE	DEVIATION AUTHORIZATION NUMBER OR NAME	DEVIATION AUTHORIZATION DATE
1	Welding Procedures	1	x							
2	NDE Procedures	2	x							
3	Heat Treatment Procedures	3	x							
4	Wall Thickness Measurement Procedure	4	x							
5	Shop Cleaning Procedures	5	x							
6	Packaging and Shipping Procedure	6	x							
7	Pneumatic Seat Leakage Test									
8	Procedure	7	x							
9	Motor Operator Test Procedure	8	x							
10	Welder Qualifications	9	x							
11	NDE Personnel Qualifications	10	x							
12	Certified Material Test Reports for									
13	Pressure Retaining Parts	11	x							
14										
15	Visual Inspection	13			x					
16	Dimensional Check	14		x						
17	Wall Thickness Measurement									
18	Documentation	15	x							
19	NDE Reports	16	x							
20	Radiographic Films and Records	17			x					
21	Heat Treatment Records	18	x							
22	Hydrostatic Shell Tests	19		x						
23	Hydrostatic Seat Tests	20		x						
24	Performance Tests	21		x						
25	Dielectric Test	22	x							

*FOR INSTRUCTIONS, SEE THIS NUMBER IN THE INSPECTION SUBSECTION.

**BY S & W INSPECTOR IF FILLED IN "X".
VERIFIED — PERSONAL OBSERVATION OF DATA APPLICABLE TO THE WORK
WITNESSED — PERSONAL OBSERVATION WHILE THE MANUFACTURER PERFORMS THE TASK
PERFORMED — PERSONAL PERFORMANCE OF THE TASK

***AS IN CONFORMANCE WITH THE SPECIFICATION OR WITH THE DEVIATION AUTHORIZATION INDICATED.

REMARKS

OFFICE | REPORTED BY | DATE

1-65B

STONE & WEBSTER ENGINEERING CORPORATION

SHOP

T.I.D. REPORT FOR MOTOR - OPERATED CARBON STEEL VALVES, CATEGORY I

▲ 5040 488 (QCD-1011) ☐ REPORT NO. _____ ☐ FINAL REPORT SHEET 2 OF 2

CLIENT: NIAGARA MOHAWK POWER CORPORATION	JO NO: 12177	MARK NO
PROJECT: NINE MILE POINT NUCLEAR STATION - UNIT 2	ORDER NO: 12P2 - P304R	ITEM NO
SELLER OR CONTRACTOR: VELAN ENGINEERING COMPANIES	SHOP ORDER NO	
SUBSUPPLIER OR SUBCONTRACTOR	SHOP NO.	
DESCRIPTION	SELLER OR CONTRACTOR'S IDENTIFICATION	
REFERENCE: ASME SECTION III, Class 3		
S & W SPECIFICATION NAME: MOTOR - OPERATED CARBON STEEL VALVES	SPECIFICATION DATE	ADDENDA THRU NO.

	TEST, INSPECTION, AND DOCUMENTATION RECORD	*	VERIFIED**	WITNESSED**	PERFORMED**	CERTIFIED*** BY (Signature)	CERTIFIED*** DATE	DEVIATION AUTHORIZATION TYPE	DEVIATION AUTHORIZATION NUMBER OR NAME	DEVIATION AUTHORIZATION DATE
1	Locked Rotor Test	23	x							
2	Pneumatic Seat Leakage Test	24		x						
3	Thrust/Torque Test	25		x						
4	Stalled Thrust/Torque Test	26		x						
5	Seismic Certificate of Compliance	27	x							
6	Manufacturer's Motor Operator Proto-									
7	type Test Data Report	28	x							
8	Motor Operator Sizing Calculations	29	x							
9	Seismic Calculations	30	x							
10	Seismic Test	31		x						
11	Operability Test	32		x						
12	Cleanliness Examination	33	x							
13	Shop Painting	34	x							
14	Marking	35	x							
15	Packaging and Shipping	36	x							
16	Records and Certifications for									
17	PREPARATION FOR SHIPMENT	37	x							
18	Manufacturer's Data Report	38	x							
19	Final Documentation Audit	39			x					
20	Documentation Check List	40	x							
21	STEM NUT LOCKNUTS	41	X							
22	SHIPPING RELEASE	42			X					
23										
24										
25										

*FOR INSTRUCTIONS, SEE THIS NUMBER IN THE INSPECTION SUBSECTION

**BY S & W INSPECTOR IF FILLED IN "X".
VERIFIED — PERSONAL OBSERVATION OF DATA APPLICABLE TO THE WORK.
WITNESSED — PERSONAL OBSERVATION WHILE THE MANUFACTURER PERFORMS THE TASK.
PERFORMED — PERSONAL PERFORMANCE OF THE TASK

***AS IN CONFORMANCE WITH THE SPECIFICATION OR WITH THE DEVIATION AUTHORIZATION INDICATED

REMARKS

OBJECT	REPORTED BY	DATE

DATA AND DRAWINGS BY SELLER 54.16

After the order is placed, the Seller shall submit all drawings in accordance with the agreed-upon schedule. The drawings submitted shall show the following: 54.20 54.21

a. All physical outlines as required to show the overall size and space requirements (including those for dismantling and maintenance) and the interrelationship of the various components. 54.24 54.25 54.26

b. Cross sections and details as required to satisfy the Engineers and Purchaser that all components are in conformance with the intent of the specification and are satisfactory from the standpoint of design and physical arrangement. 54.28 54.29 54.30

c. Weight, pressure drop or Cv, and center of gravity of the motor-operated valve units. 54.32 54.33

d. Wiring diagrams and electrical schematic control diagrams. 54.35 54.36

e. Details of special features. 54.38

f. Material parts list showing ASME or commercial designations (may be included in Items a and b). Pressure boundary parts shall be identified. 54.40 54.41 54.42

g. Minimum wall thickness of pressure boundary parts. 54.44

h. Recommended torque valves for packing gland nuts. 54.46

Each drawing shall include the following information: 54.48

Nine Mile Point Nuclear Station - Unit 2 54.51
Niagara Mohawk Power Corporation 54.52
J.O. No. 12177, P.O. No. NMP2-P304R 54.53

All drawings submitted shall be in the form of one good, sharp, black and white, direct contact print and one reproducible made from the manufacturer's original drawing. One print will be returned to the Seller marked "Approved" or "Approved as Revised." If marked "Approved as Revised," the revisions indicated shall be made and clearly identified, and one print and one reproducible of the revised drawing shall be again submitted to the Engineers. 54.56 54.57 54.58 55.2 55.3 55.4

Arrangements for production scheduling shall not be deferred pending approval of drawings. 55.7

The Engineers and Purchaser reserve the right to reproduce any drawing or print received from the Seller as may be required during the design and construction of this project and the preparation of a Plant Manual despite any notice prohibiting the same appearing on the drawing or print.

CORRESPONDENCE

All correspondence from the Seller shall contain the following subject heading:

PURCHASE ORDER NO. NMP2-P304R
MOTOR-OPERATED CARBON STEEL VALVES
NINE MILE POINT NUCLEAR STATION - UNIT 2 (J.O. No. 12177)
NIAGARA MOHAWK POWER CORPORATION

Quotations covering changes to the Purchase Documents shall be submitted to Mr. J. T. Niezabytowski, Contract Administrator-Purchasing, Niagara Mohawk Power Corporation with one copy to Mr. S. F. Manno, Project Manager, Niagara Mohawk Power Corporation, and three copies to the Project Engineer, J. O. No. 12177, Stone & Webster Engineering Corporation (CHOC).

An original and four copies of all other correspondence relative to the equipment and/or material covered by this specification shall be addressed to the Project Engineer, J.O. No. 12177 (CHOC).

Three additional copies of correspondence pertaining to technical or delivery matters shall be addressed to the attention of both Expediting Supervisor (CHOC) and Manager, Procurement Quality Control Division (Boston).

Correspondence shall be addressed as follows:

1. To Niagara Mohawk Power Corporation:

Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

2. To Stone & Webster Engineering Corporation (CHOC):

Stone & Webster Engineering Corporation
Cherry Hill Operations Center
3 Executive Campus, P.O. Box 5200
Cherry Hill, New Jersey 08043

3. To Stone & Webster Engineering Corporation (Boston): 56.5

Stone & Webster Engineering Corporation 56.7
P. O. Box 2325 56.8
Boston, Massachusetts 02107 56.9

SUBSUPPLIERS 56.15

Should the Seller propose to purchase from another 56.18
supplier any of the equipment, material, or services
specified herein he shall, upon request in the enclosed Data 56.19
Sheets or otherwise, identify the subsupplier for those
specific components itemized by the Engineers. These 56.22
subsuppliers shall be subject to approval by the Engineers.

To the extent that they apply, the Seller shall 56.24
impose on each of his subsuppliers the complete requirements 56.25
of this specification. He shall be directly responsible 56.26
that the subsuppliers are completely aware of all of these
requirements and that they abide thereby. 56.27

The subsupplier's procedures shall be reviewed by 56.29
the Seller for conformance to this specification and shall 56.30
not require approval by the Engineers. 56.31

COMPLIANCE WITH 10CRF21 56.34

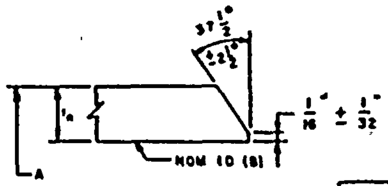
The equipment provided under this Purchase Order 56.37
are basic components of a Nuclear Regulatory Commision (NRC) 56.39
licensed facility or activity. Accordingly, the Seller is 56.40
subject to the provisions of Part 21, Chapter 1, of Title 10 56.41
of the Code of Federal Regulations. Refer to the body of 56.42
the Purchase Order for further information.

SECTION 2

SKETCHES AND SUPPLEMENTARY INFORMATION

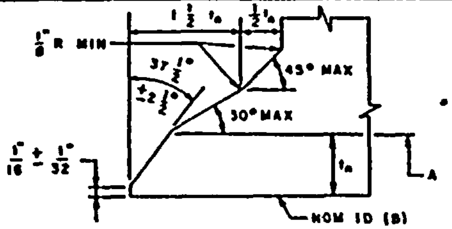
The contents of Section 2 are as follows:

STONE & WEBSTER ENGINEERING CORPORATION



$t_n = \frac{1}{4}"$ AND LESS

FIG A



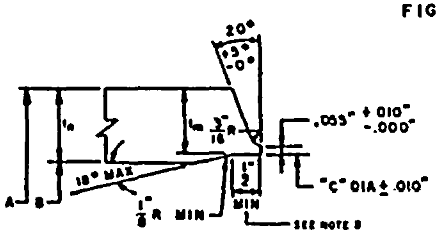
$t_n = \frac{1}{4}"$ AND LESS

FIG C

$\frac{1}{32}"$ MAX FOR NUCLEAR PIPING (ASME III)

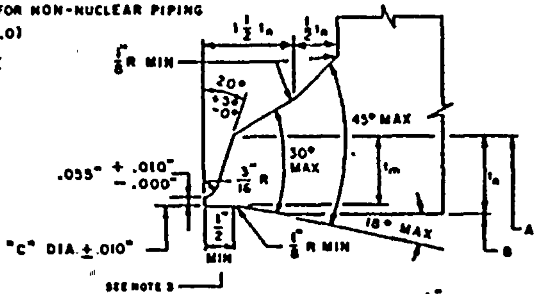
$\frac{1}{16}"$ MAX FOR NON-NUCLEAR PIPING (B31.1.0)

FIG E



t_n = GREATER THAN $\frac{1}{4}"$

FIG B



t_n = GREATER THAN $\frac{1}{4}"$

FIG D

TABLE A

NOM SIZE	SCH NO IPS	A*	B*	C	t_n	t_m
2½	10 10S	2.875	2.635	—	0.120	0.105
	STD-40-40S		2.469		0.203	0.178
	XS-80-80S		2.323	2.351	0.276	0.242
	160		2.125	2.170	0.375	0.328
	XXS		1.771	1.860	0.552	0.483
3	10 10S	3.500	3.260		0.120	0.105
	STD 40 40S		3.068		0.216	0.189
	XS-80-80S		2.900	2.934	0.300	0.263
	160		2.626	2.692	0.438	0.383
	XXS		2.300	2.400	0.600	0.525
4	10 10S	4.500	4.260		0.120	0.105
	STD 40 40S		4.026		0.237	0.207
	XS 80 80S		3.826	3.869	0.337	0.295
	120		3.626	3.692	0.438	0.383
	160		3.438	3.530	0.531	0.465
	XXS		3.152	3.270	0.674	0.590
5	10-10S	5.563	5.295		0.134	0.117
	STD-40-40S		5.047	5.078	0.258	0.226
	XS-80-80S		4.813	4.866	0.375	0.328
	120		4.563	4.647	0.500	0.438
	160		4.313	4.426	0.625	0.547
	XXS		4.063	4.209	0.750	0.656
6	10 10S	6.625	6.357		0.134	0.117
	STD 40 40S		6.065	6.094	0.280	0.245
	XS-80 80S		5.761	5.828	0.432	0.378
	120		5.501	5.600	0.562	0.492
	160		5.189	5.327	0.718	0.628
	XXS		4.897	5.072	0.864	0.756
8	10 10S	8.625	8.329		0.148	0.130
	STD 40-40S		7.981	8.030	0.322	0.282
	60		7.813	7.873	0.406	0.356
	XS-80 80S		7.625	7.709	0.500	0.438
	100		7.439	7.546	0.593	0.519
	120		7.189	7.327	0.718	0.628
	140		7.001	7.163	0.812	0.710
	XXS		6.875	7.053	0.875	0.766
	160		6.813	6.998	0.906	0.793
10	10 10S	10.750	10.420		0.165	0.144
	STD-40-40S		10.020	10.070	0.365	0.319
	XS-60-80S		9.750	9.834	0.500	0.438
	80		9.564	9.671	0.593	0.519
	100		9.314	9.452	0.718	0.628
	120		9.064	9.234	0.843	0.738
	140-XXS		8.750	8.959	1.000	0.875
	160		8.500	8.740	1.125	0.984
12	10-10S	12.750	12.390		0.180	0.158
	STD-40S		12.000	12.063	0.375	0.328
	40		11.938	11.999	0.406	0.355
	XS-80S		11.750	11.834	0.500	0.438
	60		11.626	11.725	0.562	0.492
	80		11.376	11.507	0.687	0.601
	100		11.064	11.234	0.843	0.738
	120 XXS		10.750	10.959	1.000	0.875
	140		10.500	10.740	1.125	0.984
	160		10.126	10.413	1.312	1.148

NOM SIZE	SCH NO IPS	A*	B*	C	t_n	t_m
14	10	14.000	13.500	13.521	0.250	0.219
	20		13.376	13.413	0.312	0.273
	STD-30		13.250	13.303	0.375	0.328
	40		13.124	13.192	0.438	0.383
	XS		13.000	13.084	0.500	0.438
	60		12.814	12.921	0.593	0.519
	80		12.500	12.646	0.750	0.656
	100		12.126	12.319	0.937	0.820
	120		11.814	12.046	1.093	0.956
	140		11.500	11.771	1.250	1.094
	160		11.188	11.498	1.406	1.230
16	10	16.000	15.500	15.521	0.250	0.219
	20		15.376	15.413	0.312	0.273
	STD-30		15.250	15.303	0.375	0.328
	XS-40		15.000	15.084	0.500	0.438
	60		14.688	14.811	0.656	0.574
	80		14.314	14.484	0.843	0.738
	100		13.938	14.155	1.031	0.902
	120		13.564	13.827	1.218	1.066
	140		13.124	13.442	1.438	1.258
	160		12.814	13.170	1.593	1.394
18	10	18.000	17.500	17.521	0.250	0.219
	20		17.376	17.413	0.312	0.273
	STD		17.250	17.303	0.375	0.328
	30		17.124	17.192	0.438	0.383
	XS		17.000	17.084	0.500	0.438
	40		16.876	16.975	0.562	0.492
	60		16.500	16.646	0.750	0.656
	80		16.126	16.319	0.937	0.820
	100		15.688	15.936	1.156	1.012
	120		15.250	15.553	1.375	1.203
	140		14.876	15.225	1.562	1.367
	160		14.438	14.842	1.781	1.558
20	10S	20.000	19.564	19.577	0.218	0.191
	10		19.500	19.521	0.250	0.219
	STD-20		19.250	19.303	0.375	0.328
	XS-30		19.000	19.084	0.500	0.438
	40		18.814	18.921	0.593	0.519
	60		18.376	18.538	0.812	0.710
	80		17.938	18.155	1.031	0.902
	100		17.438	17.717	1.281	1.121
	120		17.000	17.334	1.500	1.313
	140		16.500	16.896	1.750	1.531
	160		16.064	16.513	1.968	1.722
24	10	24.000	23.500	23.521	0.250	0.219
	STD-20		23.250	23.303	0.375	0.328
	XS		23.000	23.084	0.500	0.438
	30		22.876	22.975	0.562	0.492
	40		22.626	22.757	0.687	0.601
	60		22.064	22.265	0.968	0.847
	80		21.564	21.827	1.218	1.066
	100		20.938	21.280	1.531	1.340
	120		20.376	20.788	1.812	1.586
	140		19.876	20.350	2.062	1.804
	160		19.314	19.836	2.343	2.050

*REFER TO ANSI B16.25 FOR O.D.'S OF CAST STEEL VALVE ENDS AND FOR O.D. & I.D. TOLERANCES FOR ALL PRODUCT FORMS.

NOTES:

1. THESE END DETAILS ARE STONE & WEBSTER ENGINEERING CORPORATION STANDARDS FOR FIELD BUTT WELDS FOR ASME SECTION III CODE CLASSES 1, 2 & 3 PIPING AND FOR ALL AUSTENITIC STAINLESS STEEL PIPING. SHOP WELD END DETAILS SHALL CONFORM TO THE FABRICATOR'S DETAILS AS APPROVED BY THE ENGINEERS.

2. INTERNAL MACHINING IS NOT REQUIRED WHEN NOMINAL PIPE SIZE IS 4" OR LESS AND NOMINAL WALL THICKNESS IS LESS THAN $\frac{1}{4}"$. COUNTERBORE DIMENSIONS FOR SIZES AND WALL THICKNESSES NOT SHOWN IN TABLE A SHALL BE AS GIVEN IN THE PIPING SPECIFICATIONS OR AS SHOWN ON THE PIPING DRAWINGS. OUT OF ROUNDNESS OF COUNTERBORED ENDS SHALL BE LIMITED TO ±.010" OF THE "C" DIMENSION EXCEPT THAT FOR COUNTERBORED ENDS OF PIPE AND FITTINGS LIGHTER THAN SCHEDULE 60 $\left(\frac{\text{NOM OD}}{\text{NOM WALL TK}} > 25\right)$ THE DIFFERENCE BETWEEN THE MAJOR AND MINOR ID'S SHALL NOT EXCEED 0.5 PERCENT. INTERNAL MISMATCH OF PIPING COMPONENT ENDS SHALL NOT EXCEED THE LIMITS OF FIG E.

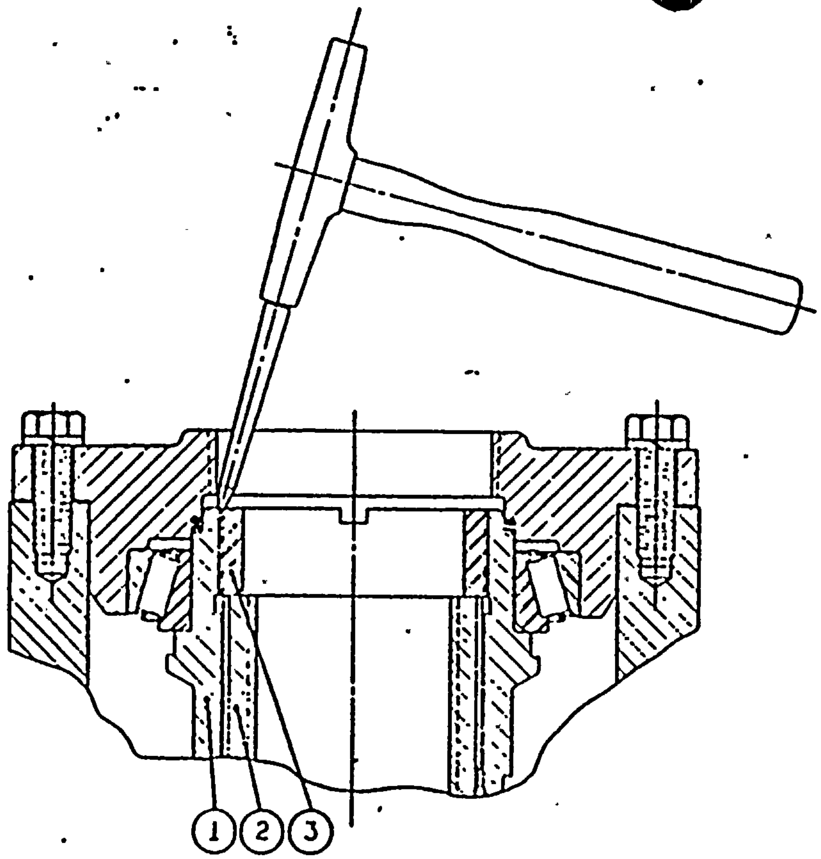
3. MIN. DEPTH OF COUNTERBORE MAY BE REDUCED TO $\frac{1}{4}"$ FOR 6" AND SMALLER NOMINAL SIZE COMPONENTS OTHER THAN PIPE. ON PIPE SUBJECT TO VOLUMETRIC IN-SERVICE INSPECTION THE COUNTERBORE, INCLUDING THE COUNTERBORE FOR SHOP BUTT WELDS IF USED, SHALL HAVE A DEPTH NOT LESS THAN $2t_n$; ON ALL PIPING COMPONENTS OTHER THAN PIPE THE $\frac{1}{4}"$ AND $\frac{1}{2}"$ MIN. COUNTERBORE DEPTHS ARE ACCEPTABLE FOR VOLUMETRIC IN-SERVICE INSPECTION.

SUPERSEDES: STD-HP-401-C-3

POWER INDUSTRY GROUP		BUTT WELD END DETAILS FOR AUSTENITIC STAINLESS STEEL AND ALL ASME III PIPING (I)
CHECKED		
CORRECT		
APPROVED		STANDARD DESIGN DRAWING
ISSUE	② ③ ④ ⑤	

ISSUE	DESCRIPTION
	STD-SP-1056-3-5

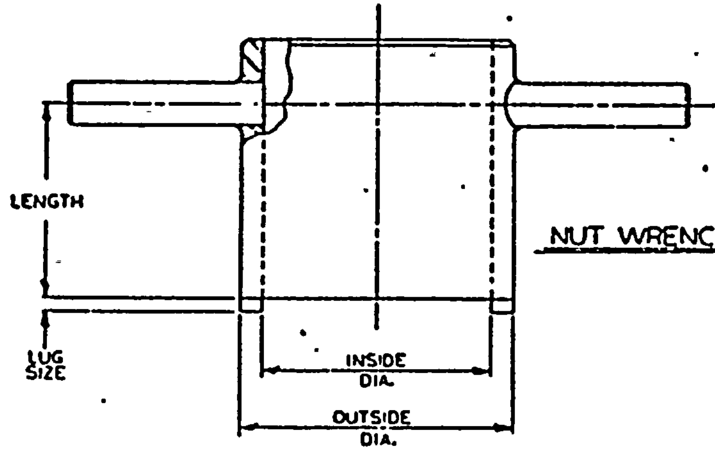
Y-E-600 -12



STEM NUT REPLACEMENT & LOCKING INSTRUCTIONS

1.- SPOT DRILL STAKES PRIOR TO LOCKNUT REMOVAL.
2.- REMOVE LOCKNUT (3) FROM DRIVE SLEEVE (1) THRU OPENING OF HOUSING COVER A SPECIAL WRENCH SUCH AS SHOWN BELOW WILL FACILITATE REMOVAL BUT IS NOT REQUIRED FOR SAME, REMOVE OLD STEM NUT (2).
3.- DROP NEW STEM NUT (2) INTO DRIVE SLEEVE (1) THRU SPLINES. TAP NUT SLIGHTLY TO MAKE SURE IT IS BOTTOMED IN THE DRIVE SLEEVE.
4.- SCREW IN LOCKNUT (3) UNTIL THE TOP IS FLUSH (APPROX.) WITH TOP OF DRIVE SLEEVE (1) AND TIGHTEN WITH WRENCH.
5.- THEN STAKE LOCKNUT IN PLACE AT TWO POINTS, 180° APART, USING STAKING TOOL AS SHOWN.

2-3A



NUT WRENCH

NUT WRENCH DIMENSION TABLE

UNIT SIZE	LENGTH	OUTSIDE DIA.	INSIDE DIA.	LUG SIZE DEPTH	LUG SIZE WIDTH
SMB/HMB—000	4 1/2	1 3/4	1 7/16	3/16	11/32
SMB/HMB—00	6 1/2	2 3/16	1 7/8	3/16	15/32
SMB/HMB—0	4 1/4	2 13/16	2 7/16	5/16	15/32
SMB/HMB—1	4 1/2	3 7/16	3	5/16	15/32
SMB/HMB—2	5	4 3/16	3 9/16	5/16	15/32
SMB/HMB—3	5	6	5 1/8	5/16	19/32
SMB/HMB—4	5 1/2	6 1/2	5 1/4	5/16	3/4

REVISIONS | DESCRIPTION | D | C | B | A

DRN. DEV
CHKD. A.C.

LIMITORQUE CORPORATION

NAME LOCKING NUT ASSEMBLING INSTRUCTION

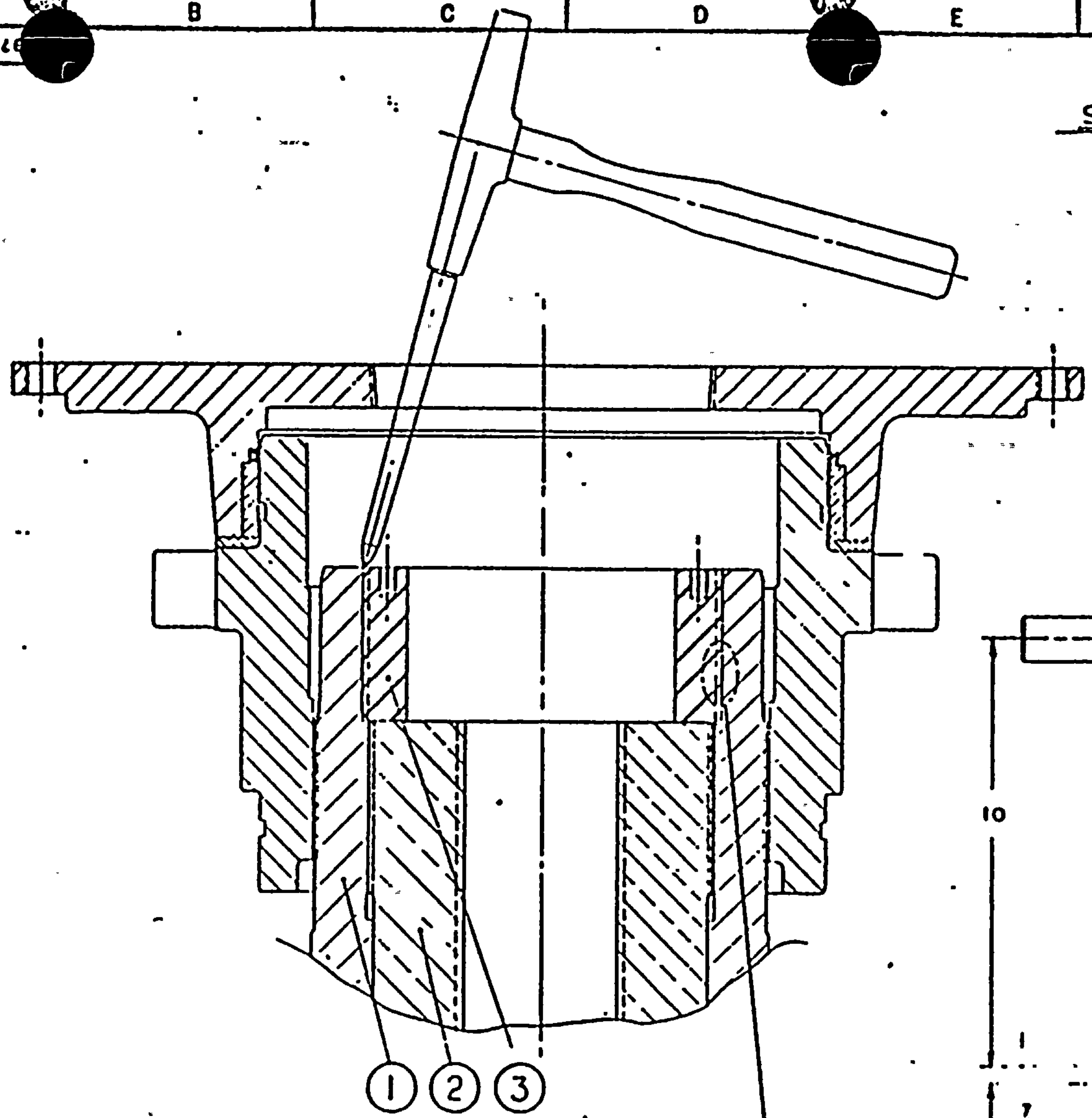
UNIT SIZE SMB/HMB - 000 - 4

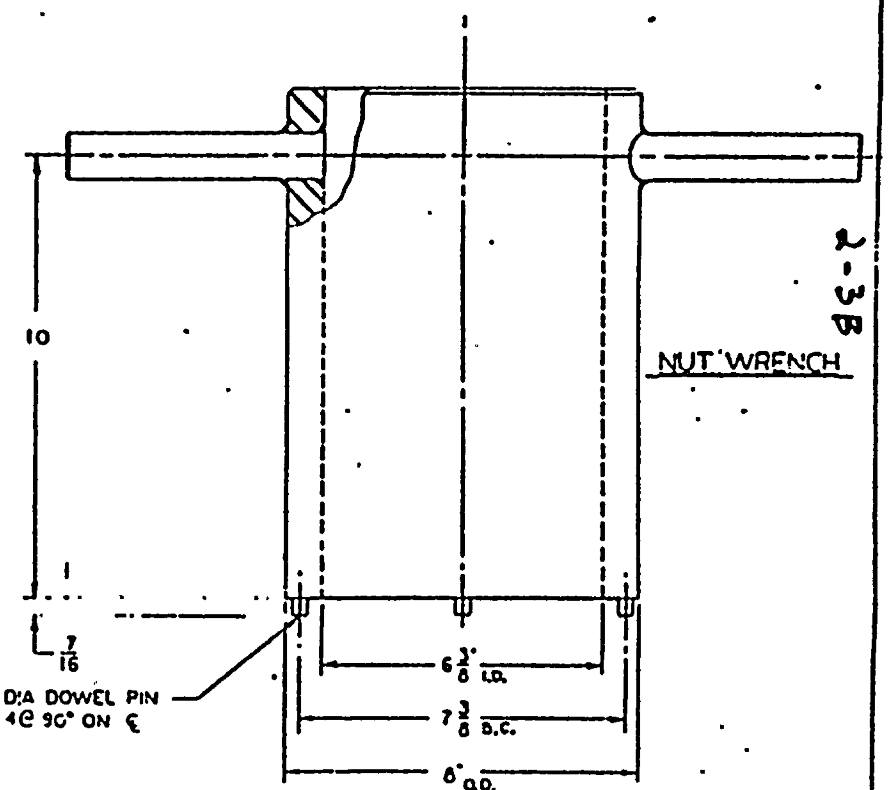
DWG. NO. 21-497-0009-3-A

DATE 3-9-76 SCALE HALF SHEET — of —

STEM NUT REPLACEMENT & LOCKING INSTRUCTIONS

1. SPOT DRILL STAKES PRIOR TO LOCKNUT REMOVAL.
2. REMOVE LOCKNUT (3) FROM DRIVE SLEEVE (1) THRU OPENING OF HOUSING COVER A SPECIAL WRENCH SUCH AS SHOWN BELOW WILL FACILITATE REMOVAL BUT IS NOT REQUIRED FOR SAME REMOVE OLD STEM NUT (2).
3. DROP NEW STEM NUT (2) INTO DRIVE SLEEVE (1) THRU SPLINES. TAP NUT SLIGHTLY TO MAKE SURE IT IS BOTTOMED IN THE DRIVE SLEEVE.
4. SCREW IN LOCKNUT (3) UNTIL THE TOP IS FLUSH (APPROX.) WITH TOP OF DRIVE SLEEVE (1) AND TIGHTEN WITH WRENCH.
5. THEN STAKE LOCKNUT IN PLACE AT TWO POINTS 180° APART USING STAKING TOOL AS SHOWN.

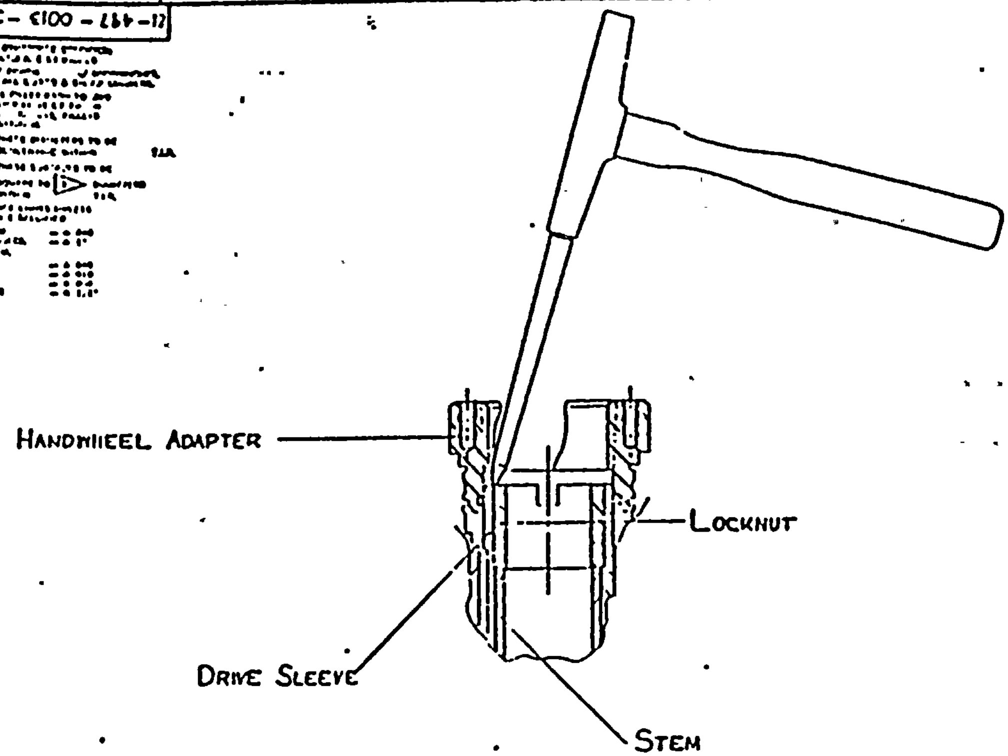




NUT WRENCH

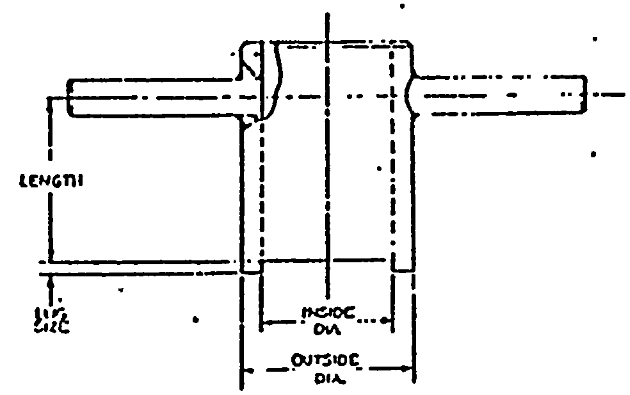
DRN. DCV	LIMITORQUE CORPORATION
CHKD.	NAME LOCKING NUT ASSEMBLING INSTRUCTION
APPVD JFS	SMB - 5
	DWG. NO. 21- 497 -0010- 3 - REV A
DATE 3·10·76	SCALE HALF

REVISIONS



STEM NUT REPLACEMENT & LOCKING INSTRUCTIONS

1. SPOT [illegible] STAKES [illegible] TO [illegible] REMOVAL.
2. REMOVE LOCKNUT FROM DRIVE SLEEVE. [illegible] OF HANDWHEEL ADAPTER & SLEEVE WRENCH SUCH AS SHOWN BELOW, WILL FACILITATE REMOVAL BUT IS NOT REQUIRED FOR SAME; THEN REMOVE OLD STEM NUT.
3. [illegible] NEW STEM NUT INTO DRIVE SLEEVE [illegible]. TAP NUT SLIGHTLY TO MAKE SURE IT IS BOTTOMED IN THE DRIVE SLEEVE.
4. SCREW IN LOCKNUT UNTIL THE [illegible] IS FLUSH [illegible] WITH TOP OF DRIVE SLEEVE AND TIGHTEN WITH WRENCH.
5. THEN STAKE LOCKNUT IN PLACE AT TWO POINTS 180 APART USING STAKING TOOL AS SHOWN.



NUT WRENCH

NUT WRENCH DIMENSIONS

	LENGTH	OUTSIDE DIA.	INSIDE DIA.	LUG DEPTH	SIZE WIDTH
SMC 03	2 1/4	2.00	1.62	.25	.34
SMC 04	1 1/2	1.31	1.06	.25	.22

LIMITORQUE CORPORATION

LOCKING NUT ASSEMBLING INSTRUCTION

SMC-03,04

21-497-C013-3-?

3-7-78 FULL SHEET 1 OF 1

SECTION 3 1.9

LIST OF REFERENCES 1.11

a. Piping Drawings 1.14
b. Stress Reports 1.15
c. Piping Engineering and Design Specification 1.16
d. Line Designation Tables 1.17
e. Approved Vendor Drawings 1.18

SECTION 4

TECHNICAL DATA BY SELLER

The contents of Section 4 are as follows:

BASIS

Equipment: Motor-Operated Carbon Steel Valves

Project: Nine Mile Point Nuclear Station - Unit 2

Purchaser: Niagara Mohawk Power Corporation

Based on Stone & Webster Specification Dated November 26, 1975
Addendum A: December 31, 1975
Revised: September 17, 1976

Data Submitted By:

Company: Velan Engineering Companies

Signed by: D. H. Hillen

Title: Vice President, Sales

Date: January 30, 1976

The data submitted by the successful Bidder, modified if necessary by mutual agreement with the Engineers, is included in the purchase specification as a firm commitment of what the Seller will furnish. Their inclusion in the specification in no way relieves the Seller of his responsibilities as set forth in the purchase documents.

MOTOR OPERATED VALVE DATA SHEET NOTES

The following are explanatory notes covering the Motor-Operated Valve Data Sheets by Engineers.

1. The valve description numbers and mark numbers used in this specification are applicable to the Nine Mile 2 Project only. These numbers are not interchangeable with and are not to be used for any other Stone & Webster project. Conversely, other Stone & Webster project valve description and mark numbers are not applicable to the Nine Mile 2 Project.

2. The valve description number format is developed in accordance with the VALVE DESCRIPTION NUMBER tabulation, included herein.

Descriptions included in this specification:

VGW015-G Gate valve, 150 lb, BW, SA350 LF2 CS body, (A105 Alt) stellited trim, bolted bonnet, OS&Y, flexible wedge, integral seat.

VGW015-P Gate valve, 150lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, bolted bonnet, OS&Y, flexible wedge, integral seat.

VGW030-C Gate valve, 300 lb, BW, SA350 LF2 CS body, (A105 Alt) stellited trim, bolted bonnet, OS&Y, flexible wedge, integral seat.

VGW030-G Gate valve, 300 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, bolted bonnet, OS&Y, flexible wedge, integral seat.

VGW060-C Gate valve, 600 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, bolted bonnet, OS&Y, flexible wedge, integral seat.

VGW060-G Gate valve, 600 lb, BW, SA350 LF2 CS body, (A105 Alt) stellited trim, bolted bonnet, OS&Y, flexible wedge, integral seat.

VGW090-C Gate valve, 900 lb, BW, SA350 LF2 CS body, (A105 Alt) stellited trim, pressure seal bonnet, OS&Y, flexible wedge, integral seat.

VGW090-F Gate valve, 900 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, pressure seal bonnet, OS&Y, flexible wedge, integral seat.

VOW015-H Globe valve, 150 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, bolted bonnet, OS&Y, swivel plug, integral seat.

VOW030-D Globe valve, 300 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, bolted bonnet, OS&Y, swivel plug, integral seat.

VOW060-B Globe valve, 600 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, bolted bonnet, OS&Y, swivel plug, integral seat.

VOW090-C Globe valve, 900 lb, BW, SA105 CS body, (A350 LF2 Alt) stellited trim, pressure seal bonnet, OS&Y, swivel plug, integral seat.

VOW090-G Globe valve, 900 lb, BW, SA350 LF2 CS body, (A105 Alt) stellited trim, pressure seal bonnet, OS&Y, swivel plug, integral seat.

3. Definition of the requirements listed under "Special Requirements" on the Motor-Operated Valve Data Sheets by Engineers are as follows:

   a. Position transmitter - Refer to the Motor Operator subsection of this specification.

   b. Welded transition piece - The valve manufacturer shall supply the specified valve with a short spool of pipe welded to the valve as specified herein. The shop weld will be a dissimilar metal weld (P1 to P8). The spool of pipe will be supplied to the valve manufacturer, cut to length with machined end preps, by the Engineers with appropriate documentation.

   c. Active valve - One which performs a mechanical motion during the course of accomplishing a system safety function. Refer to U.S.N.R.C. Regulatory Guide 1.48 and the SEISMIC REQUIREMENTS section of this specification.

   d. Low seat leakage - Refer to the TESTS section of this specification.

4. "Standard" operating time is defined in the Motor Operator subsection of this specification. Valves requiring operating times other than "standard" shall be noted under "Special Requirements" on the Motor-Operated Valve Data Sheets by Engineers.

5. Items altered by addenda on the Motor-Operated Valve Data Sheets by Engineers are identified by the applicable addendum number to the right of the item changed.

1. The valve description numbers have been compiled by selecting symbols from the following table:

Type of Valve	Symbol	End Connection	Symbol	Pressure Rating	Symbol	Special Class Valve Pressure Rating	Symbol	Code Class	Symbol
Angle	VA	Butt Welded	W	125 lb	012	NOT USED		ASME III	
Ball	VB	Socket Welded	S	150 lb	015	NOT USED		Class 1	1
Check	VC	Threaded	T	175 lb	017	NOT USED		Class 2	2
Diaphragm	VD	Flanged	F	200 lb	020	NOT USED		Class 3	3
Gate	VG	Insert	I	300 lb	030	Special Design	000	B31.1	4
Stop Check	VK	All Others	H	600 lb	060	300 Special*	03X		
Globe	VO			900 lb	090	600 Special*	06X		
Plug	VP			1,050 lb	105	900 Special*	09X		
Bellows Seal	VS			1,500 lb	150	1500 Special*	15X		
Butterfly	VV								

*This special class valve rating is to be applied to B16.34 Butt Weld End Valves 300 lb & above only.

Example: VG H 015-*-1**

- Gate Valve
- Butt Welded End
- 150 Lb
- Code Class

*This suffix letter covers all other variables such as body material, trim, bonnet type, etc. For complete description see Valve Description Printout.

**The attached examples show additional suffix letters for accessories.

4.2e

2. A unique letter code added to the Code Class Symbol is provided for the Weld End Preparation for each Butt Welded End Valve. This letter code is to designate the Pipe Wall Schedule and the corresponding "C" Bore Dimension as specified in SGW Standard STD-SP-1056-1-5 and STD-SP-1056-3-5.

Example: VGWG90-B-1M - The unique letter "M" after the Code Class Symbol designates the Valve End Preparation is to match S80 Pipe.

The following table is to be used for selecting the proper letter code for each Piping Class and Nominal Size:

	Piping Class																	
Size	121 151 151H or 151C	152	153 163	156	157 or 162	301 or 302	153M 303M	311	601	602	611 or 901	911	902	921	912 or 1502	1511	1501 or 1512
2 1/2	K	G	K	J	G	K	P	K	K	J	M	M	J	W	N	W	W
3	K	G	K	J	G	K	P	K	K	J	M	M	J	W	N	W	W
4	K	G	K	J	G	K	P	K	K	J	M	M	J	T	N	W	T
6	K	G	K	J	G	K	P	K	K	J	M	M	J	T	N	W	T
8	K	G	K	J	G	K	P	K	P	J	M	R	N	T	N	W	T
10	K	K	K	J	K	K	P	K	P	J	M	R	N	T	M	W	T
12	K	K	K	J	K	K	P	K	P	J	M	R	L	T	M	W	T
14	K	K	K	J	K	K	P	K	L	H	M	R	L	T	M	W	T
16	K	K	K	J	K	K	P	P	L	H	M	R	L	T	M	W	T
18	K	K	K	J	K	K	P	P	L	H	M	R	L	T	M	Y	T
20	K	K	K	J	K	P	P	H	L	H	M	R	L	T	M	Y	T
22	K	K	K	J	K	P	P	H	L	H	M	R	L	T	M	Y	T
24	K	K	K	J	K	P	P	H	L	H	M	R	L	T	M	Y	T

Where:

Letter Code	= Pipe Schedule
G	10S
H	40
J	40S
K	Std
L	60
M	80
N	80S
P	XS
R	100
T	120
W	160
X	XXS
Y	140
Z	Special Pipe

4-2D

3. In addition the following letter codes are used to indicate special features as follows:

B	-	Bypass	E	-	Welded Transition Piece
D	-	Body Drain	V	-	Bonnet Vent
S	-	Stem Leakoff Connection	A	-	Fire Safe Design

Q - Valve Specified, Purchased, and Marked by Manufacturer with SCH Mark Number and Valve Description Number for Unique Identification due to Special Engineered Features. Refer to Valve Data Sheet in Purchase Specification.

4. To indicate Raised Face or Flat Face Flanges for Flanged Valves, the letter "R" for Raised Face and "F" for Flat Face is used after the Code Class number or any letter requirements. For example, a Flanged End Valve requiring Raised Face Flanges would be identified as "VGF09G-B-1R."

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3C
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

S & W Mark No.	2 RHS - MOV 142	2 RHS - MOV 149
GE #:	E12-F040	E12-F049
Valve		
Quantity	One	One
Size	3 Inch	3 Inch
Type	Globe	Gate
Service	Throttling	Shutoff
Fluid	Water	Water
S & W Description No.	VGW030 - D - 2XQ 1	VGW030 - G - 2XQ 1
Rating	300#	300#
Material	SA-105	SA-105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	150	150
Max. Diff. Press.-psi	350	350
Temperature Range - °F	40 - 335 13	40 - 335 13
Maximum Flow	175 gpm	175 gpm
Design Pressure - psig.	500	500
Design Temperature - F	358	358
Pipe Schedule	Std.	Std.
"Z" Bore	3.068"	3.068"
Trim	STELLITE 2	STELLITE 2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	ACTIVE VALVE	ACTIVE VALVE
	Position Transmitter required	

REV. 3 CJF 10/17/79		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DJ DATE

	2 MSI - MOV 1A	2 MSI - MOV 1B
S & W Mark No.		
Valve		
Quantity	One	One
Size	3 Inch	3 Inch
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW060 - B-1ZQ | 1	VGW060 - B-1ZQ | 1
Rating	600#	600#
Material	SA-105	SA-105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	275	275
Max. Diff. Press.-psi	275	275
Temperature Range - °F	100 - 585	100 - 585
Maximum Flow	400 gpm | 1	400 gpm | 1
Design Pressure - psig.	1250 | 1	1250 | 1
Design Temperature - F	575 | 1	575 | 1
Pipe Schedule	Inlet: Std.	Inlet: Std.
	Outlet: Sch. 80	Outlet: Sch. 80
" " Bore	Inlet "B" 3.068"	Inlet: "B" 3.068"
	Outlet "C" 2.934"	Outlet "C" 2.934"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Isc.	3) Outside Isc.

REV. 3

REV. 2

REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DATE

S & W Mark No.	2 MSI - MOV 2A	2 MSI - MOV 2B
Valve		
Quantity	One	One
Size	3 Inch	3 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW060 - C - 1MQ | 1	VGW060 - C - 1MQ | 1
Rating	600#	600#
Marerial	SA105	SA105
End Prepararion	Butt Weld	Butt Weld
Normal Oper. Press.-psi	275	275
Max. Diff. Press.-psi	275	275
Temperature Range - °F	100 - 585=	100 - 585
Maximum Flow	400 gpm	400 gpm
Design Pressure - psig.	1250 | 1	1250 | 1
Design Temperature - F	575 | 1	575 | 1
Pipe Schedule	Sch. 80	Sch. 80
"C" Bore	2.934"	2.934"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Inside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE 2) Low Seat Leakage 3) Inside Iso.	1) ACTIVE VALVE 2) Low Seat Leakage 3) Inside Iso.

REV.	
REV. 3	
REV. 2	
REV. 1	

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY:

	2 MSS - MOV 111	2 MSS - MOV 112
S & W Mark No.	6E 8	B22-F016	B22-F019
Valve		
Quantity	One	One
Size	6 Inch [R-3]	6 Inch [R-2]
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Steam/Condensate	Steam/Condensate
S & W Description No.	VOW060 - B - 1MQ [1]	VOW060 - B - 1MQ [1]
Rating	600#	600#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	980 [1]	980 [1]
Max. Diff. Press.-psi	1220 [1]	1220 [1]
Temperature Range - °F	65 - 573 [1]	65 - 573 [1]
Maximum Flow	385 gpm [1]	385 gpm [1]
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule	Sch. 80	Sch. 80
" " Bore Inlet:	RCW 2.934"	RCW 2.934"
Outlet:	RCW 2.934"	RCW 2.900"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Inside Isol.	3) Outside Iso.
		4) End Prep. for Class 4 on Outlet

REV. 3
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R

J.O. NO. 12177

DATE

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: QS

	2 MSS - MOV 1A	2 MSS - MOV 1B
S & W Mark No.		
GE #	B22-F070A	B22-F070B
-Valve		
Quantity	One	One
Size	3 Inch	3 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Steam/Condensate	Steam/Condensate
S & W Description No.	VGW090 - F - 4MG	VGW090 - F - 4MG
Rating	900#	900#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	980	980
Max. Diff. Press.-psi	1220	1220
Temperature Range - °F	65 - 575	65 - 575
Maximum Flow	85 gpm	85 gpm
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule	Sch. 80	Sch. 80
"B" Bore	2.900"	2.900"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Std. Cl. B	Std. Cl. B
Normal Ambient Temp.-C	65.6	65.6
Location	Outside Prl. Containment	Outside Prl. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	Compliance to "Operability Testing" Section of this Specification is required.	
	DELETED	DELETED

3

Rev. 3 CCJ 10/12/78

Rev. 2

Rev. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 3M
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

S & W Mark No.	2MSS - MOV 1C	2MSS - MOV 1D
GE #	B22-F070C	B22-F070D
Valve		
Quantity	One	One
Size	3 Inch	3 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Steam/Condensate	Steam/Condensate
S & W Description No.	VGW090 - E-4MQ	VGW090 - E-4MQ
Rating	900#	900#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	980	980
Max. Diff. Press.-psi	1220	1220
Temperature Range - F	65 - 573	65 - 573
Maximum Flow	85 gpm	85 gpm
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule	Sch. 80	Sch. 80
"D" Bore	2.900"	2.900"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Std. Cl. B	Std. Cl. B
Normal Ambient Temp.-C	65.6	65.6
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	Compliance to "Operability Testing" Section of this Specification is required.	
	DELETED	DELETED
REV. 3 CCJ 10/12/79		
REV. 2		
REV. 1		

3

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

	2 ASS - MOV 109		2 EDS - MOV 129	
S & W Mark No.				
GE # :	N1A		G12-F082	
Valve				
Quantity	One		One	
Size	2½ Inch	1	3 Inch	
Type	Gate		Gate	1
Service	Shutoff		Shutoff	
Fluid	Steam		Water	
S & W Description No.	VGW090 - F - 4MVQ	4	VGW090 - F - 1WQ	2
Rating	900#		900#	
Material	SA105		SA105	
End Preparation	Butt Weld		Butt Weld	
Normal Oper. Press.-psi	1000		1005	
Max. Diff. Press.-psi	1250	1	1510	
Temperature Range - F	40 - 575		40 - 575	
Maximum Flow	13,500 lb/hr	1	15	
Design Pressure - psig.	1250	1	1750	
Design Temperature - F	575	1	575	
Pipe Schedule	Sch. 80		160	2
"B" Bore	2.323"		"C" 2.692	2
Trim	Stellite		Stellite	
Motor Operator				
Enclosure	NEMA 4		NEMA 4	
Power-Volts/Phase/Hz	575/3/60		575/3/60	
Insulation Class	Std. Cl. B		Cl. B(R)	
Normal Ambient Temp.-C	65.5		65.5	
Location	Outside Pri. Containment		Outside Pri. Containment	
No. Limit Switch Contacts:				
Close	4 Open 4 Closed		4 Open 4 Closed	
Open	4 Open 4 Closed		4 Open 4 Closed	
Special Requirements	Compliance to "Operability Testing" Section of this specification is required.		1) Low Seat Leakage 2) Outside Iso.	
			DELETED	4

REV. 3 CGJ 10/12/78
REV. 2

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 32
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

S & W Mark No.	2 CCP - MOV 4A	2 CCP - MOV 4B
Valve		
Quantity	One	One
Size	4 Inch	4 Inch
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W ~~Description~~ No.	VGW015 - H - 2KQ (1)	VGW015 - H - 2KQ (1)
~~Rating~~	150#	150#
~~Material~~	SA105	SA105
~~End Preparation~~	Butt Weld	Butt Weld
~~Normal Oper. Press.-psi~~	100	100
~~Max. Diff. Press.-psi~~	150	150
~~Temperature Range - °F~~	40 - 160	40 - 160
~~Maximum Flow~~	642 gpm	642 gpm
Design Pressure - psig.	200	200
Design Temperature - F	250	250
Pipe Schedule	Std.	Std.
"B" Bore	4.026"	4.026"
~~Trim~~	STELLITE (2)	STELLITE (2)
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Outside Iso.
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: GD DATE

	2 CCP - MOV 5A	2 CCP - MOV 5B
S & W Mark No.		
Valve		
Quantity	One	One
Size	4 Inch	4 Inch
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VCW015 - H - 2KQ [1]	VCW015 - H - 2KQ [1]
Rating	150#	150#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	100	100
Max. Diff. Press.-psi	150	150
Temperature Range - °F	40 - 160	40 - 160
Maximum Flow	642 gpm	642 gpm
Design Pressure - psig.	200	200
Design Temperature - F	250	250
Pipe Schedule	Std.	Std.
"R" Bore	4.026"	4.026"
Trim	STELLITE [2]	STELLITE [2]
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE 2) Low Seat Leakage 3) Outside Iso.	1) ACTIVE VALVE 2) Low Seat Leakage 3) Outside Iso.

REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DATE

S & W Mark No.	2 CCP - MOV 21A	2 CCP - MOV 21B
Valve		
Quantity	One	One
Size	4 Inch	4 Inch
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VCW015 - H - 2KQ | 1	VCW015 - H - 2KQ | 1
Rating	150#	150#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	100	100
Max. Diff. Press.-psi	150	150
Temperature Range - °F	40 - 160	40 - 160
Maximum Flow	642 gpm	642 gpm
Design Pressure - psig.	200	200
Design Temperature - F	250	250
Pipe Schedule	Std.	Std.
"B" Bore	4.026"	4.026"
Trim	STELLITE | 2	STELLITE | 2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Inside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Inside Iso.	3) Inside Iso.
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3W
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

	S & W Mark No.	2 CCP - MOV 22A		2 CCP - MOV 22B	
	Valve				
	Quantity	One		One	
	Size	6 Inch	1	6 Inch	1
	Type	Gate		Gate	
	Service	Shutoff		Shutoff	
	Fluid	Water		Water	
	S & W Description No.	VGW015 - P - 3EQ	2	VGW015 - P - 3KQ	1
	Rating	150#		150#	
	Material	SA105		SA105	
	End Preparation	Butt Weld		Butt Weld	
	Normal Oper. Press.-psi	100		100	
	Max. Diff. Press.-psi	150		150	
	Temperature Range - °F	40 - 160		40 - 160	
	Maximum Flow	375 gpm	1	375 gpm	1
	Design Pressure - psig.	200		200	
	Design Temperature - F	250		250	
	Pipe Schedule	Std.		Std.	
	"C" Bore	6.094"	2	6.094"	2
	Trim	STELLITE	2	STELLITE	2
	Motor Operator				
	Enclosure	NEMA 4		NEMA 4	
	Power-Volts/Phase/Hz	575/3/60		575/3/60	
	Insulation Class	Cl. H(R)		Cl. H(R)	
	Normal Ambient Temp.-C	65.5		65.5	
	Location	Outside Pri. Containment		Outside Pri. Containment	
	No. Limit Switch Contacts				
	Close	4 Open 4 Closed		4 Open 4 Closed	
	Open	4 Open 4 Closed		4 Open 4 Closed	
	Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	

REV. 3
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

1	S & W Mark No.	2 SWP - MOV 38A		2 SWP - MOV 38B	
2					
3	Valve				
4	Quantity	One		One	
5	Size	6 Inch	1	6 Inch	1
6	Type	Gate		Gate	
7	Service	Shutoff		Shutoff	
8	Fluid	Water		Water	
9	S & W Description No.	VGW015 - P - 3KQ	1	VGW015 - P - 3KQ	1
10	Rating	150#		150#	
11	Material	SA105		SA105	
12	End Preparation	Butt Weld		Butt Weld	
13	Normal Oper. Press.-psi	70	1	70	1
14	Max. Diff. Press.-psi	108	1	108	1
15	Temperature Range - °F	32 - 77		32 - 77	
16	Maximum Flow	375 gpm	1	375 gpm	1
17	Design Pressure - psig.	150	R2 1	150	R2 1
18	Design Temperature - F	130	1	130	1
19	Pipe Schedule	Std.		Std.	
20					
21	"C" Bore	6.094	2	6.094	2
22					
23	Trim	STELLITE	2	STELLITE	2
24					
25	Motor Operator				
26	Enclosure	NEMA 4		NEMA 4	
27	Power-Volts/Phase/Hz	575/3/60		575/3/60	
28	Insulation Class	Std. Cl. B		Std. Cl. B	
29	Normal Ambient Temp.-C	65.5		65.5	
30					
31					
32	Location	Outside Pri. Containment		Outside Pri. Containment	
33					
34	No. Limit Switch Contacts				
35	Close	4 Open 4 Closed		4 Open 4 Closed	
36	Open	4 Open 4 Closed		4 Open 4 Closed	
37					
38					
39	Special Requirements				
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
	REV. 3				
	REV. 2				
	REV. 1				

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3AA
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

1	S & W Mark No.	2 SWP - MOV 39A		2 SWP - MOV 39B	
2					
3	Valve				
4	Quantity	One		One	
5	Size	6 Inch	1	6 Inch	1
6	Type	Gate		Gate	
7	Service	Shutoff		Shutoff	
8	Fluid	Water		Water	
9	S & W Description No.	VGW015 - P - 3KQ	1	VGW015 - P - 3KQ	1
10	Rating	150#		150#	
11	Material	SA105		SA105	
12	End Preparation	Butt Weld		Butt Weld	
13	Normal Oper. Press.-psi	70	1	70	1
14	Max. Diff. Press.-psi	108	1	108	1
15	Temperature Range - °F	32 - 90		32 - 90	
16	Maximum Flow	375 gpm	1	375 gpm	1
17	Design Pressure - psig.	150 R2	1	150 R2	1
18	Design Temperature - F	130	1	130	1
19	Pipe Schedule	Std.		Std.	
20					
21	"C" Bore	6.094"	2	6.094"	2
22					
23	Trim	STELLITE	2	STELLITE	2
24					
25	Motor Operator				
26	Enclosure	NEMA 4		NEMA 4	
27	Power-Volts/Phase/Hz	575/3/60		575/3/60	
28	Insulation Class	Std. Cl. B		Std. Cl. B	
29	Normal Ambient Temp.-C	65.5		65.5	
30					
31					
32	Location	Outside Pri. Containment		Outside Pri. Containment	
33					
34	No. Limit Switch Contacts				
35	Close	4 Open 4 Closed		4 Open 4 Closed	
36	Open	4 Open 4 Closed		4 Open 4 Closed	
37					
38					
39	Special Requirements				
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
	REV. 3				
	REV. 2				
	REV. 1				

A3028.40

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3CC
SPEC. NO. NMP2-P 304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: DATE

S & W Mark No.	2 CSL - MOV 107		2 - MOV
GE #	E21-F011		
Valve			
Quantity	One		One
Size	4 Inch		
Type	Gate		
Service	Shutoff		
Fluid	Water		
S & W Description No.	VGW030 - G - 2KQ	1	Intentionally
Rating	300#		left
Material	SA105		blank
End Preparation	Butt Weld		
Normal Oper. Press.-psi	435		
Max. Diff. Press.-psi	500	2	
Temperature Range - °F	40 - 212		
Maximum Flow	750 gpm		
Design Pressure - psig.	600	2	
Design Temperature - F	212		
Pipe Schedule	Std.		
"B" Bore	4.026"		
Trim	STELLITE	2	
Motor Operator			
Enclosure	NEMA 4		NEMA 4
Power-Volts/Phase/Hz	575/3/60		
Insulation Class	Cl. H(R)		
Normal Ambient Temp.-C	65.5		65.5
Location	Outside Pri. Containment		Pri. Containment
No. Limit Switch Contacts			
Close	4 Open 4 Closed		4 Open 4 Closed
Open	4 Open 4 Closed		4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE		
	2) Low Seat Leakage		
	3) Outside Iso.		
	4) Time to operate		
	a) Open - 4 sec (max)	1	
	b) Close - 4 sec (max)		
REV. 3			
REV. 2			
REV. 1			

A2013-60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY:

	2RHS - MOV 33A	2RHB - MOV 33B
S & W Mark No.		
GE #	E12-F027A	E12-F027A
Valve		
Quantity	One	One
Size	4 Inch	4 Inch
Type	Globe	Globe
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VCW030 - D - 2KQ	VCW030 - D - 2KEQ 2
Rating	300#	300#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	350	350
Max. Diff. Press.-psi	350	350
Temperature Range - °F	70 - 212	70 - 212
Maximum Flow	450 gpm	450 gpm
Design Pressure - psig.	500	500
Design Temperature - F	358	358
Pipe Schedule	Std.	Std.
"B" Bore	4.026"	4.026"
Trim	STELLITE 2	STELLITE 2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE 2) Low Seat Leakage 3) Outside Iso.	1) ACTIVE VALVE 2) Low Seat Leakage 3) Outside Iso. 4) Welded transition piece required
REV. 3		
REV. 2		
REV. 1		

A0018.60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 306
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: DJS

	S & W Mark No.	2 RHS - MOV 37A	2 RHS - MOV 37B
	QE #	E12-F011A	E12-F011B
	Valve		
	Quantity	One	One
	Size	4 Inch	4 Inch
	Type	Globe	Globe
	Service	Shutoff	Shutoff
	Fluid	Water	Water
	S & W Description No.	VGW030 - D - 2KQ | 1	VGW030 - D - 2KQ | 1
	Rating	300#	300#
	Material	SA105	SA105
	End Preparation	Butt Weld	Butt Weld
	Normal Oper. Press.-psi	200	200
	Max. Diff. Press.-psi	200	200
	Temperature Range - °F	40 - 212	40 - 212
	Maximum Flow	277 gpm | 4	190 gpm | 4
	Design Pressure - psig.	500	500
	Design Temperature - F	212	212
	Pipe Schedule	Std.	Std.
	"B" Bore	4.026"	4.026"
	Trim	STELLITE | 4	STELLITE | 4
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	Cl. H(R)	Cl. H(R)
	Normal Ambient Temp.-C	65.5	65.5
	Location	Outside Pri. Containment	Outside Pri. Containment
	No. Limit Switch Contacts		
	Close	4 Open 4 Closed.	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
		2) Low Seat Leakage	2) Low Seat Leakage
		3) Outside Iso.	3) Outside Iso.
	REV. 3		
	REV. 2		
	REV. 1		

A3028-60

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DATE

1	S & W Mark No.	2RHS - MOV 32A	2 RHS - MOV 32B
2	GE #	E12-F026A	E12-F026B
3	Valve		
4	Quantity	One	One
5	Size	4 Inch	4 Inch
6	Type	Gate	Gate
7	Service	Shutoff	Shutoff
8	Fluid	Water	Water
9	S & W Description No.	VGW030 - G - 2SQ [2]	VGW030 - G - 2SQ [2]
10	Rating	300#	300#
11	Material	SA105	SA105
12	End Preparation	Butt Weld	Butt Weld
13	Normal Oper. Press.-psi	200	200
14	Max. Diff. Press.-psi	200	200
15	Temperature Range - °F	40 - 212	40 - 212
16	Maximum Flow	277 gpm	277 gpm
17	Design Pressure - psig.	500	500
18	Design Temperature - F	212	212
19	Pipe Schedule	Std.	Std.
20			
21	"B" Bore	4.026"	4.026"
22			
23	Trim	STELLITE [2]	STELLITE [2]
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	Cl. H(R)	Cl. H(R)
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	Outside Pri. Containment	Outside Pri. Containment
33			
34	No. Limit Switch Contacts		
35	Close	4 Open 4 Closed	4 Open 4 Closed
36	Open	4 Open 4 Closed	4 Open 4 Closed
37			
38			
39	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
	REV. 3		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3KK
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible]

S & W Mark No.	2 WCS - MOV 101	2 WCS - MOV 104
GE #	G33-F101	G33-F106
Valve		
Quantity	One	One
Size	4 Inch	4 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW060 - C - 1MQ 11	VGW060 - C - 1MQ 11
Rating	600#	600#
Material	SA105	SA105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1050	1050
Max. Diff. Press.-psi	1050	1050
Temperature Range - °F	40 - 575	40 - 575
Maximum Flow	168 gpm	432 gpm
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule	Sch. 80	Sch. 80
"C" Bore	3.869"	3.869"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Inside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements		
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: QS DATE

	S & W Mark No.	2 ICS - MOV 120	2 ICS - MOV 124
	GE #	E51-F045	E51-F059
	Valve		
	Quantity	One	One
	Size	4 Inch	4 Inch
	Type	Globe	Gate
	Service	Shutoff	Shutoff
	Fluid	Steam	Water
	S & W Description No.	VGW090 - C - 2TQ | 1	VGW090 - F - 22SQ | 1
	Rating	900#	900#
	Material	SA105	SA105
	End Preparation	Butt Weld	Butt Weld
	Normal Oper. Press.-psi	1125	1265
	Max. Diff. Press.-psi	1140 | 1	1265
	Temperature Range - °F	70 - 560	40 - 100
	Maximum Flow	33,000 lb/hr	600 gpm
	Design Pressure - psig.	1250	1684
	Design Temperature - F	575	170
	Pipe Schedule	Sch. 120 | 1	Inlet: SCH 120 | 2
			Outlet: Sch. 108
	"C" Bore	3.692" | 1	Inlet: "C" = 3.692 | 2
			Outlet: "C" = 3.826 | 4
	Trim	Stellite	Stellite
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	120 v dc	120 v dc
	Insulation Class	Cl. H(R)	Cl. H(R)
	Normal Ambient Temp.-C	65.5	65.5
	Location	Outside Pri. Containment	Outside Pri. Containment
	No. Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
		2) Time to operate:	2) Welded transition piece required.
		a) Close - 15 sec (max)	
		b) Open - 15 sec (max)	
	REV. 3		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3M1
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible]

S & W Mark No.	2WCS - MOV 105	2 - MOV
GE #	633-F100	
Valve		
Quantity	One	One
Size	4 Inch	
Type	Gate	
Service	Shutoff	
Fluid	Water	
S & W Description No.	VGW060 - C - 1MQ (1)	Intentionally
Rating	600#	left
Material	SA105	Blank
End Preparation	Butt Weld	
Normal Oper. Press.-psi	1050	
Max. Diff. Press.-psi	1050	
Temperature Range - °F	40 - 575	
Maximum Flow	432 gpm	
Design Pressure - psig.	1250	
Design Temperature - F	575	
Pipe Schedule	Sch. 80	
"C" Bore	3.869"	
TRIM	STELLITE (2)	
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	[illegible]/3/60	
Insulation Class	Cl. B(R)	
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements		
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3YY
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

S & W Mark No.	2 RHS - MOV 4C	2 WCS - MOV 102
GE #	E12-E064C	G33-E001
Valve		
Quantity	One	One
Size	6 Inch	8 INCH 2
Type	Gate	Globe
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW030 - G - 2KQ 1	VGW060 - G - 1MQ 1
Rating	300#	600#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Wld.
Normal Oper. Press.-psi	350	1050
Max. Diff. Press.-psi	350	1050
Temperature Range - °F	40 - 335 1	40 - 575
Maximum Flow	1000 gpm	900 gpm
Design Pressure - psig.	500	1362 2
Design Temperature - F	358	575
Pipe Schedule	Std.	Sch. 80
"t" Bore	6.094"	
Trim	STELLITE. 2	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Inside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Inside Iso.
4	4) CLOSING TIME = 6½ SEC	4) CLOSING TIME = 14 SEC 4
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3rN
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

	2RHS - MOV 4A	2RHS - MOV 4B
S & W Mark No.		
GE #	E12-F064A	E12-F064B
Valve		
Quantity	One	One
Size	6 Inch	6 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW030 - G - 2KQ [1]	VGW030 - G - 2KQ [1]
Rating	300#	300#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	350	350
Max. Diff. Press.-psi	350	350
Temperature Range - °F	40 - 335 [1]	40 - 335 [1]
Maximum Flow	1000 gpm	1000 gpm
Design Pressure - psig.	500	500
Design Temperature - F	358	358
Pipe Schedule	Std.	Std.
"h" Bore	6.094"	6.094"
TRIM	STELLITE [2]	STELLITE [2]
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Outside Iso.
[4]	4) CLOSING TIME = 6½ SEC	4) CLOSING TIME = 6½ SEC [4]
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 399
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: GS

S & W Mark No.	2 WCS - MOV 200	4	2 WCS - MOV 98	
GE #	G33-F040A		G33-F040B	
Valve				
Quantity	One		One	
Size	8 INCH	2	8 INCH	2
Type	Globe		Globe	
Service	Shutoff		Shutoff	
Fluid	Water		Water	
S & W Description No.	VCW090 - C - 12Q	1	VCW090 - C - 12Q	1
Rating	900#		900#	
Material	SA105		SA105	
End Preparation	Butt Weld		Butt Weld	
Normal Oper. Press.-psi	1100		1100	
Max. Diff. Press.-psi	1100		1100	
Temperature Range - °F	40 - 545		40 - 545	
Maximum Flow	814 gpm		814 gpm	
Design Pressure - psig.	2200		2200	
Design Temperature - F	450	2	450	2
Pipe Schedule OUTLET	Sch. 160	2	Sch. 160	2
INLET	SCH 120	2	SCH 120	2
"C" Bore OUTLET	6.998	2	6.998	2
INLET	7.327	2	7.327	2
TRIM	STELLITE	2	STELLITE	2
Motor Operator				
Enclosure	NEMA 4		NEMA 4	
Power-Volts/Phase/Hz	575/3/60		575/3/60	
Insulation Class	Cl. H(R)		Cl. H(R)	
Normal Ambient Temp.-C	65.5		65.5	
Location	Outside Pri. Containment		Outside Pri. Containment	
No. Limit Switch Contacts				
Close	4 Open 4 Closed		4 Open 4 Closed	
Open	4 Open 4 Closed		4 Open 4 Closed	
Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	
	2) Low Seat Leakage		2) Low Seat Leakage	
	3) Outside Iso.		3) Outside Iso.	
			DELETED	
REV. 3				
REV. 2				
REV. 1				

A-8306-40

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3SS
SPEC. NO. NMP2-P 304R
J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible] DATE

1	S & W Mark No.	2 CCP - MOV 122		2 CCP - MOV 124	
2					
3	Valve				
4	Quantity	One		One	
5	Size	8 Inch	1	8 Inch	1
6	Type	Gate		Gate	
7	Service	Shutoff		Shutoff	
8	Fluid	Water		Water	
9	S & W Description No.	VGW015 - P - 22Q	13 1	VGW015 - P - 22Q	13 1
10	Rating	150#		150#	
11	Material	SA 105	13 1	SA105	13 1
12	End Preparation	Butt Weld		Butt Weld	
13	Normal Oper. Press.-psi	100		100	
14	Max. Diff. Press.-psi	150		150	
15	Temperature Range - °F	40 - 160		40 - 160	
16	Maximum Flow	1200 gpm	1	1200 gpm	1
17	Design Pressure - psig.	200		200	
18	Design Temperature - F	250		250	
19	Pipe Schedule	Std.		Std.	
20					
21	" " Bore Inlet	min = 7.981"	1	min = 8.020"	1
22	Outlet	min = 8.020"	1	min = 7.981"	1
23	Trim	STELLITE	12	STELLITE	12
24					
25	Motor Operator				
26	Enclosure	NEMA 4		NEMA 4	
27	Power-Volts/Phase/Hz	575/3/60		575/3/60	
28	Insulation Class	Cl. H(R)		Cl. H(R)	
29	Normal Ambient Temp.-C	65.5		65.5	
30					
31					
32	Location	INSIDE Prt. Containment	4	Outside Prt. Containment	
33					
34	No. Limit Switch Contacts				
35	Close	4 Open 4 Closed		4 Open 4 Closed	
36	Open	4 Open 4 Closed		4 Open 4 Closed	
37					
38					
39	Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	
40		2) Low Seat Leakage		2) Low Seat Leakage	
41		3) INSIDE ISO.	4	3) Outside Iso.	
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
	Rev. 3 CCI 10/17/77				
	Rev. 2				
	Rev. 1				

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 300
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: Ja

S & W Mark No.	2ICS - MOV 129	2ICS - MOV 136
GE #	E51-F010	E51-F031
Valve		
Quantity	One	One
Size	6 Inch	6 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW015 - P - 2KEQ 1	VGW015 - P - 2KEQ 1
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	25	25
Max. Diff. Press.-psi	100	25
Temperature Range - °F	40 - 100	40 - 170
Maximum Flow	600 gpm	600 gpm
Design Pressure - psig.	100	100
Design Temperature - F	170	170
Pipe Schedule	Std.	Std.
"C" Bore	6.094"	6.094"
TRIM	STELLITE 2	STELLITE 2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	120 v dc	120 v dc
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Welded transition piece	2) Low Seat Leakage
	required	3) Outside Iso.
	3) - Requirement deleted - 1	4) Welded transition piece
		required
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: GP

S & W Mark No.	2WCS - MOV 103	2 WCS - MOV 112
GE #	6733-F102	6733-F004
Valve		
Quantity	One	One
Size	8 INCH [2]	8 INCH [2]
Type	Globe	Globe
Service	Throttling	Shutoff
Fluid	Water	Water
S & W Description No.	VQW060 - 8 - 1MQ [1]	VQW060 - 8 - 1MQ [1]
Rating	600#	600#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1050	1050
Max. Diff. Press.-psi	1050	1050
Temperature Range - °F	40 - 575	40 - 575
Maximum Flow	863 gpm	901 gpm
Design Pressure - psig.	1250	1362 [2]
Design Temperature - F	575	575
Pipe Schedule	Sch. 80	Sch. 80
"C" Bore	7.709 [R2]	7.709 [R2]
TRIM	STELLITE [2]	STELLITE [2]
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Inside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) Position transmitter required	1) ACTIVE VALVE 2) Low Seat Leakage 3) Outside Iso. 4) CLOSING TIME = 14 SEC [4]

REV. 3
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: GD

1	S & W Mark No.	2 WCS - MOV 106		2 WCS - MOV 107	
2	6E #	G33-F035		G33-F034	
3	Valve				
4	Quantity	One		One	
5	Size	6 Inch		6 Inch	
6	Type	Gate		Gate	
7	Service	Shutoff		Shutoff	
8	Fluid	Water		Water	
9	S & W Description No.	VGW090 - F - 3Q	1	VGW090-F - 3Q	1
10	Rating	900#		900#	
11	Material	SA 105		SA 105	
12	End Preparation	Butt Weld		Butt Weld	
13	Normal Oper. Press.-psi	1100		1100	
14	Max. Diff. Press.-psi	1100		1100	
15	Temperature Range - F	40 - 140	2	40 - 140	2
16	Maximum Flow	690 GPM	2	690 GPM	2
17	Design Pressure - psig.	1420	2	1420	2
18	Design Temperature - F	150		150	
19	Pipe Schedule Inlet:	Sch 120		Sch 120	
20	Outlet:	Std.		Std.	
21	"C" Bore Inlet:				
22	Outlet:	6.094"		6.094"	
23	Trim	Stellite		Stellite	
24					
25	Motor Operator				
26	Enclosure	NEMA 4		NEMA 4	
27	Power-Volts/Phase/Hz	575/3/60		575/3/60	
28	Insulation Class	Cl. H(R)		Cl. H(R)	
29	Normal Ambient Temp.-C	65.5		65.5	
30					
31					
32	Location	Inside Pri. Containment		Inside Pri. Containment	
33					
34	No. Limit Switch Contacts				
35	Close	4 Open 4 Closed		4 Open 4 Closed	
36	Open	4 Open 4 Closed		4 Open 4 Closed	
37					
38					
39	Special Requirements				
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
	REV. 3				
	REV. 2				
	REV. 1				

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3EEE
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation.
PROJECT Nine Mile Point - Unit No. 2 BY: 92

1	S & W Mark No.	2 WCS - MOV 108		2 WCS - MOV 110
2	GE #	633-E031		633-E044
3	Valve			
4	Quantity	One		One
5	Size	4 INCH	2	8 INCH	2
6	Type	Globe		Globe
7	Service	Throttling		Throttling
8	Fluid	Water		Water
9	S & W Description No.	VGW090 - C - 3TQ	2	VGW090 - C - 3TQ	2
10	Rating	900#		900#
11	Material	SA 105		SA 105
12	End Preparation	Butt Weld		Butt Weld
13	Normal Oper. Press.-psi	1150	2	1200
14	Max. Diff. Press.-psi	1150	2	1200
15	Temperature Range - °F	40 - 140	2	40 - 140	2
16	Maximum Flow	690 GPM	2	690 GPM	2
17	Design Pressure - psig.	1420		1420
18	Design Temperature - F	150		150
19	Pipe Schedule	Sch. 120		Sch. 120
20				
21	"C" Bore			
22				
23	Trim	Stellite		Stellite
24				
25	Motor Operator			
26	Enclosure	NEMA 4		NEMA 4
27	Power-Volts/Phase/Hz	575/3/60		575/3/60
28	Insulation Class	Std. Cl. B		Std. Cl. B
29	Normal Ambient Temp.-C	65.5		65.5
30				
31				
32	Location	Outside Pri. Containment		Outside Pri. Containment
33				
34	No. Limit Switch Contacts			
35	Close	4 Open 4 Closed		4 Open 4 Closed
36	Open	4 Open 4 Closed		4 Open 4 Closed
37				
38				
39	Special Requirements	Position transmitter required.		Position transmitter required.
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
	REV. 3			
	REV. 2			
	REV. 1			

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3GG3
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible]

S & W Mark No.	2 RHS - MOV 104		2 ICS - MOV 126	
GE #	E12-F023		E51-F013	
Valve				
Quantity	One		One	
Size	6 Inch		6 Inch	
Type	Globe		Gate	
Service	Throttling		Shutoff	
Fluid	Water		Water	
S & W Description No.	VGW090 - C - 12Q	1	VGW090 - F - 12Q	2
Rating	900#		900#	
Material	SA 105		SA105	
End Preparation	Butt Weld		Butt Weld	
Normal Oper. Press.-psi	350	4	1525	1
Max. Diff. Press.-psi	350	4	1525	1
Temperature Range - °F	70 - 540		40 - 575	
Maximum Flow	870	4	616 gpm	
Design Pressure - psig.	1525	4	1684	
Design Temperature - F	575		575	
Pipe Schedule Inlet:	Std.		SCH 120	2
Outlet:	Sch. 80		SCH 80	2
"C" Bore Inlet:	6.094"		5.600"	2
Outlet:	5.828"		5.828"	2
Trim	Stellite		Stellite	
Motor Operator				
Enclosure	NEMA 4		NEMA 4	
Power-Volts/Phase/Hz	575/3/60		120 v dc	
Insulation Class	Cl. H(R)		Cl. H(R)	
Normal Ambient Temp.-C	65.5		65.5	
Location	Outside Pri. Containment		Outside Pri. Containment	
No. Limit Switch Contacts				
Close	4 Open 4 Closed		4 Open 4 Closed	
Open	4 Open 4 Closed		4 Open 4 Closed	
Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	
	2) Low Seat Leakage		2) Low Seat Leakage	
	3) Outside Iso.		3) Outside Iso.	
	4) Position Transmitter Required.		4) Time to Operate	
			a) Close - 15 sec (max)	
			b) Open - 15 sec. (max.)	
REV. 3				
REV. 2				
REV. 1				

A3086 80

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2

BY: DS DATE

	2 GTS - MOV 4A	2 GTS - MOV 4B
S & W Mark No.		
Valve		
Quantity	One	One
Size	8 Inch	8 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Air	Air
S & W Description No.	VGW015 - P - 2KQ. [1]	VGW015 - P - 2KQ [1]
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	± 10" W.C.	± 10" W.C.
Max. Diff. Press.-psi	25	25
Temperature Range - °F	60 - 104	60 - 104
Maximum Flow	400 CFM	400 CFM
Design Pressure - psig.	25	25
Design Temperature - F	250	250
Pipe Schedule	Std.	Std.
"C" Bore	8.020"	8.020"
Trim	STELLITE [2]	STELLITE [2]
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE

REV. 3

REV. 2

REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3XXX
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [signature]

S & W Mark No.	2 RHS - MOV 22A		2 RHS - MOV 22B	
GE #	E12-F052A		E12-F052B	
Valve				
Quantity	One		One	
Size	8 Inch		8 Inch	
Type	Globe		Globe	
Service	THROTTLE	2	THROTTLE	2
Fluid	Steam		Steam	
S & W Description No.	VGW090 - C - 2RQ	1	VGW090 - C - 2RQ	1
Rating	900#		900#	
Material	SA 105		SA 105	
End Preparation	Butt Weld		Butt Weld	
Normal Oper. Press.-psi	1015		1015	
Max. Diff. Press.-psi	1015		1015	
Temperature Range - °F	140 - 546		140 - 546	
Maximum Flow	136,200 lb/hr	1	136,200 lb/hr	1
Design Pressure - psig.	1250		1250	
Design Temperature - F	575		575	
Pipe Schedule	Sch. 100	1	Sch 100	1
"C" Bore	7.546"	1	7.546"	1
Trim	Stellite		Stellite	
Motor Operator				
Enclosure	NEMA 4		NEMA 4	
Power-Volts/Phase/Hz	575/3/60		575/3/60	
Insulation Class	Cl. H(R)		Cl. H(R)	
Normal Ambient Temp.-C	65.5		65.5	
Location	Outside Pri. Containment		Outside Pri. Containment	
No. Limit Switch Contacts				
Close	4 Open 4 Closed		4 Open 4 Closed	
Open	4 Open 4 Closed		4 Open 4 Closed	
Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	

REV 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3MMM
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

1	S & W Mark No.	2 RHS - MOV 23A	2 RHS - MOV 23B
2	GE #	E12-F087A	E12-F087A
3	Valve		
4	Quantity	One	One
5	Size	8 Inch	8 Inch
6	Type	Globe	Globe
7	Service	THROTTLE 12	THROTTLE 12
8	Fluid	Steam	Steam
9	S & W Description No.	VCW090 - C - 22Q 11	VCW090 - C - 22Q 11
10	Rating	900#	900#
11	Material	SA 105	SA 105
12	End Preparation	Butt Weld	Butt Weld
13	Normal Oper. Press.-psi	1015	1015
14	Max. Diff. Press.-psi	1015	1015
15	Temperature Range - °F	140 - 546	140 - 546
16	Maximum Flow	93,500 lb/hr 13	93,500 lb/hr 13
17	Design Pressure - psig.	1250	1250
18	Design Temperature - F	575	575
19	Pipe Schedule Inlet:	Sch 100 11	Sch 100 11
20	Outlet:	Sch 80 11	Sch 80 11
21	"D" Bore Inlet:	7.546" 11	7.546" 11
22	Outlet:	7.709" 11	7.709" 11
23	Trim	Stellite	Stellite
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	Cl. H(R)	Cl. H(R)
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	Outside Pri. Containment	Outside Pri. Containment
33			
34	No. Limit Switch Contacts		
35	Close	4 Open 4 Closed	4 Open 4 Closed
36	Open	4 Open 4 Closed	4 Open 4 Closed
37			
38			
39	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
	REV 3 CCI 1011778		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3 000
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY:

S & W Mark No.	2 HCS - MOV 109	2 HCS - MOV 111
Valve		
Quantity	One	One
Size	8 Inch	8 Inch
Type	Globe	Globe
Service	Throttling	Throttling
Fluid	Water	Water
S & W Description No.	VOW090 - C - 3TQ 12	VOW090 - C 3TQ 12
Rating	900#	900#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1200	1200
Max. Diff. Press.-psi	1200	1200
Temperature Range - F	40 - 546	40 - 546
Maximum Flow	814 gpm	358 gpm
Design Pressure - psig.	1420	1420
Design Temperature - F	575	575
Pipe Schedule	Sch. 120	Sch. 120
"C" Bore		
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Std. Cl. B	Std. Cl. B
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) Position transmitter required	1) Position transmitter required

REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3SSS
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: GS

S & W Mark No.	2 SWP - MOV 17A	2 SWP - MOV 17B
Valve		
Quantity	One	One
Size	12 Inch	12 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VG1015 - P - 3KQ | 1	VG1015 - P - 3KQ | 1
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	91 | 1	91 | 1
Max. Diff. Press.-psi	108 | 1	108 | 1
Temperature Range - F	32 - 77	32 - 77
Maximum Flow	2400 gpm | 1	2400 gpm | 1
Design Pressure - psig.	150 | 3 | 1	150 | 3 | 1
Design Temperature - F	130 | 1	130 | 1
Pipe Schedule	Std.	Std.
"d" Bore	12.053"	12.053"
TRIM	STELLITE | 2	STELLITE | 2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts:		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE

REV. 3 CCJ 10/12/78
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY:

	S & W Mark No.	2 CCP - MOV 14A	2CCP - MOV 14B
	Valve		
	Quantity	One	One
	Size	12 Inch	12 Inch
	Type	Gate	Gate
	Service	Shutoff	Shutoff
	Fluid	Water	Water
	S & W Description No.	VGW015 - P - 32Q |1	VGW015 - P - 32Q |1
	Rating	150#	150#
	Material	SA 105	SA 105
	End Preparation	Butt Weld	Butt Weld
	Normal Oper. Press.-psi	100	100
	Max. Diff. Press.-psi	150	150
	Temperature Range - F	40 - 160	40 - 160
	Maximum Flow	2250 gpm	2250 gpm
	Design Pressure - psig.	200	200
	Design Temperature - F	250	250
	Pipe Schedule Inlet:	Std.	Std.
	Outlet:	Std.	Std.
	" " Bore Inlet:	"B" = 12.000"	"B" = 12.000"
	Outlet:	"C" = 12.053"	"C" = 12.053"
	Trim	STELLITE |2	STELLITE |2
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	Cl. H(R)	Cl. H(R)
	Normal Ambient Temp.-C	65.5	65.5
	Location	Outside Pri. Containment	Outside Pri. Containment
	No. Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	REV. 3		
	REV. 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3WWW
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: GT

S & W Mark No.	2 CCP - MOV 18A	2 CCP - MOV 18B
Valve		
- Quantity	One	One
Size	12 Inch	12 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW015 - P - 32Q [1]	VGW015 - P - 32Q [1]
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	100	100
Max. Diff. Press.-psi	150	150
Temperature Range - °F	40 - 160	40 - 160
Maximum Flow	2250gpm	2250 gpm
Design Pressure - psig.	200	200
Design Temperature - F	250	250
Pipe Schedule Inlet:	Std.	Std.
Outlet:	Std.	Std.
" " Bore Inlet:	"C" = 12.053"	"C" = 12.053"
Outlet:	"B" = 12.000"	"B" = 12.000"
Trim	STELLITE [2]	STELLITE [2]
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
REV. 3		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DATE

	S & W Mark No.	2 SWP - MOV 18A		2 SWP - MOV 18B	
	Valve				
	Quantity	One		One	
	Size	12 Inch		12 Inch	
	Type	Gate		Gate	
	Service	Shutoff		Shutoff	
	Fluid	Water		Water	
	S & W Description No.	VGW015 - P - 3KQ	1	VGW015 - P - 3KQ	1
	Rating	150#		150#	
	Material	SA 105		SA 105	
	End Preparation	Butt Weld		Butt Weld	
	Normal Oper. Press.-psi	91	1	91	1
	Max. Diff. Press.-psi	108		108	
	Temperature Range - °F	32 - 90		32 - 90	
	Maximum Flow	2400 gpm	1	2400 gpm	1
	Design Pressure - psig.	150	1,3	150	1,3
	Design Temperature - F	130	1	130	1
	Pipe Schedule	Std.		Std.	
	"n" Bore	12.053"		12.053"	
	Trim	STELLITE	2	STELLITE	2
	Motor Operator				
	Enclosure	NEMA 4		NEMA 4	
	Power-Volts/Phase/Hz	575/3/60		575/3/60	
	Insulation Class	Cl. H(R)		Cl. H(R)	
	Normal Ambient Temp.-C	65.5		65.5	
	Location	Outside Pri. Containment		Outside Pri. Containment	
	No. Limit Switch Contacts				
	Close	4 Open 4 Closed		4 Open 4 Closed	
	Open	4 Open 4 Closed		4 Open 4 Closed	
	Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	

REV. 3 CGJ 12/13/77

REV. 2 J

REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3rd rev
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

	2 CSL - MOV 104	2 ICS - MOV 122
S & W Mark No.		
GE #	E21-F005	E51-F042
Valve		
Quantity	One	One
Size	12 Inch	12 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Steam
S & W Description No.	VGW060 - C - 12DQ [3] [1]	VGW015 - P - 2 [illegible] Q [3] [1]
Rating	600#	150#
Material	SA105 [3]	SA105 [3] [1]
End Preparation	Butt Wld.	Butt Weld
Normal Oper. Press.-psi	725	5 [3]
Max. Diff. Press.-psi	725	200 [1]
Temperature Range - °F	40 - 575	70 - 250
Maximum Flow	8000 gpm	28000 lb/hr [3]
Design Pressure - psig.	1359	150
Design Temperature - F	575	340 [1]
Pipe Schedule Inlet:	Std.	Std.
Cutlet:	Sch. 80	Std.
"C" Bore Inlet:	12.053"	12.053"
Outlet:	11.507"	12.353"
Trim	Stellite [1]	STELLITE [2]
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	120 v dc
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Outside Iso.
	4) Time to operate: [4]	4) Welded transition piece required
	a) Close - 20 SEC	5) Requirement deleted - [1]
	b) Open - 20 SEC [4]	

REV. 3 CC: 10/17/79
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3[illegible]
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible]

S & W Mark No.	2 ICS - MOV 121	2 - MOV
GE #	E51-F064	
Valve		
Quantity	One	One
Size	10 Inch	
Type	Gate	
Service	Shutoff	
Fluid	Steam	
S & W Description No.	VGW090-F-120 (13)(2)	Intentionally
Rating	900#	left
Material	SA 105 (13)	blank
End Preparation	Butt Weld	
Normal Oper. Press.-psi	1140	
Max. Diff. Press.-psi	1140	
Temperature Range - °F	70 - 560	
Maximum Flow	207,300 lb/hr	
Design Pressure - psig.	1250	
Design Temperature - F	575	
Pipe Schedule INLET	SCH 80 (2)	
OUTLET	SCH 100 (2)	
"C" Bore INLET	9.671" (2)	
OUTLET	9.452" (2)	
TRIM	STELLITE (2)	
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60 (2)	
Insulation Class	Cl. H(R)	
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	
	2) Low Seat Leakage	
	3) Outside Isc.	
	4) Time to Operate	
	a) Close - 15 sec. (max)	
	b) Open - 15 sec. (max)	
REV. 3	[illegible] 10/13/78	
REV. 2		
REV. 1		

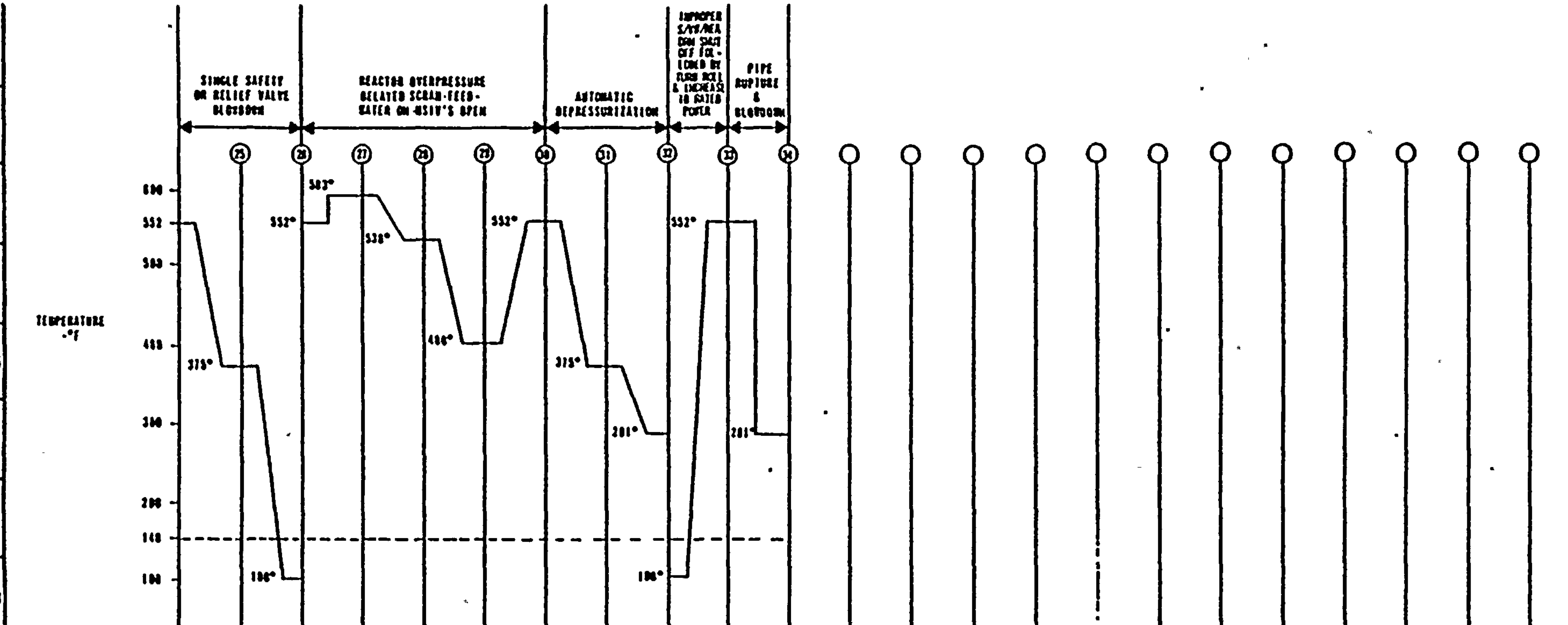
STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 33GG
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

1	S & W Mark No.		2 RHS - MOV 40A	2 RHS - MOV 40B
2	GE #		E12-F053A	E12-F053B
3	Valve			
4	Quantity		One	One
5	Size		12 Inch	12 Inch
6	Type		Globe	Globe
7	Service		Throttle [1]	Throttle [1]
8	Fluid		Water	Water
9	S & W Description No.		VOW090 - C - 12Q [3] [1]	VOW090 - C - 12Q [3] [1]
10	Rating		900#	900#
11	Material		SA 105 [3]	SA 105 [3]
12	End Preparation		Butt Weld	Butt Weld
13	Normal Oper. Press.-psi		350 [R2]	350 [R2]
14	Max. Diff. Press.-psi		350 [R2]	350 [R2]
15	Temperature Range - °F		70 - 540	70 - 540
16	Maximum Flow		7450 gpm	7450 gpm
17	Design Pressure - psig.		1550	1550
18	Design Temperature - F		575	575
19	Pipe Schedule Inlet:		Std.	Std.
20	Outlet:		Sch. 100	Sch. 100
21	"A" Bore Inlet:		12.057"	12.057"
22	Outlet		11.234"	11.234"
23	Trim		Stellite	Stellite
24				
25	Motor Operator			
26	Enclosure		NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz		575/3/60	575/3/60
28	Insulation Class		Cl. H(B)	Cl. H(B)
29	Normal Ambient Temp.-C		65.5	65.5
30				
31				
32	Location		Outside Pri. Containment	Pri. Containment
33				
34	No. Limit Switch Contacts			
35	Close		4 Open 4 Closed	4 Open 4 Closed
36	Open		4 Open 4 Closed	4 Open 4 Closed
37				
38				
39	Special Requirements		1) ACTIVE VALVE	1) ACTIVE VALVE
40			2) Low Seat Leakage	2) Low Seat Leakage
41			3) Outside Iso.	3) Outside Iso.
42			4) Time to operate:	4) Time to operate:
43			Open - 29 sec (max) [1]	Open - 29 sec (max) [1]
44			Close - 29 sec (max)	Close - 29 sec (max)
45			5) POSITION TRANS-	5) POSITION TRANS-
46			-MITTER REQ'D [2]	-MITTER REQ'D [2]
47				
48				
49				
50				
51				
	REV. 3			
	REV. 2			
	REV. 1			



RATE OF TEMP. CHANGE -°F/HR	1002	100	STEP	5500	100	100	3210	300	100	STEP
PRESSURE-PSIG	550	50	1250	1050	240	1050	650	35	1050	35
DURATION OF FINAL TEMPERATURE-HR	1 SEC	-	1 SEC	1 SEC	3 SEC	—	5 SEC	-	-	-
AVERAGE VELOCITY FT:SEC	-	-	-	-	-	-	-	-	-	7
NUMBER OF CYCLES LIFE OF PLANT	8	8	1	1	1	1	1	1	1	1

REF. DWG. 12177-EP-78A-F

PAGE 2 OF 2

REDRAWN

REACTOR CORE ISOLATION-COOLING
RETURN, RHR HEAD SPRAY
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation

12177-SK-A96

NO. 26

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 31111
SPEC. NO NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2
BY: [illegible]

1	S & W Mark No.	23HS - MOV 116		2 RHS - MOV 115	
2	GE #	E12-F094		E12-F093	
3	Valve				
4	Quantity	One		One	
5	Size	16 Inch		16 Inch	
6	Type	Gate		Gate	
7	Service	Shutoff		Shutoff	
8	Fluid	Water		Water	
9	S & W Description No.	VGW015 - P - 3XQ	1	VGW030-6-27Q	2
10	Rating	150#		300#	1
11	Material	SA 105		SA 105	
12	End Preparation	Butt Weld		Butt Weld	
13	Normal Oper. Press.-psi	78	1	95	
14	Max. Diff. Press.-psi	125	1	95	
15	Temperature Range - °F	32-77	1	40 - 170	
16	Maximum Flow	7400 gpm		7400 gpm	
17	Design Pressure - psig.	150		500	
18	Design Temperature - F	150	1	358	
19	Pipe Schedule INLET	Std.		STD	2
20	OUTLET			XS	2
21	"t" Bore INLET	15.303"		15.303"	2
22	OUTLET			15.084"	2
23	TRIM	STELLITE	2	STELLITE	2
24					
25	Motor Operator				
26	Enclosure	NEMA 4		NEMA 4	
27	Power-Volts/Phase/Hz	575/3/60		575/3/60	
28	Insulation Class	Cl. H(R)		Cl. H(R)	
29	Normal Ambient Temp.-C	65.5		65.5	
30					
31					
32	Location	Outside Pri. Containment		Outside Pri. Containment	
33					
34	No. Limit Switch Contacts				
35	Close	4 Open 4 Closed		4 Open 4 Closed	
36	Open	4 Open 4 Closed		4 Open 4 Closed	
37					
38					
39	Special Requirements	1) ACTIVE VALVE		1) ACTIVE VALVE	
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
	REV. 3				
	REV. 2				
	REV. 1				

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4 - 3XXXX
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: [illegible]

S & W Mark No.	2 RHS - MOV 15A	2 RHS - MOV 15B
GE #	E12-F016A	E12-F016B
Valve		
Quantity	One	One
Size	16 Inch	16 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW030 - G - 2PQ B|1	VGW030 - G - 2PQ B|1
Rating	300#	300#
Material	SA 105 B|2	SA 105 B|2
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	350	350
Max. Diff. Press.-psi	350	350
Temperature Range - °F	40 - 170	40 - 170
Maximum Flow	8400 gpm	8400 gpm
Design Pressure - psig.	500	500
Design Temperature - F	358	358
Pipe Schedule	XS |1	XS |1
"D" Bore	15.084" |1	15.084" |1
Trim	STELLITE |2	STELLITE |2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Outside Iso.
REV. 3	[illegible]	
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 14 - 30000
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: QT

	S & W Mark No.	2 RHS - MOV 25A	2 RHS - MOV 25B
	GE #	E12-F017A	E12-F017A
	Valve		
	Quantity	One	One
	Size	16 Inch	16 Inch
	Type	Gate	Gate
	Service	Shutoff	Shutoff
	Fluid	Water	Water
	S & W Description No.	VGW030 - G - 2PQ 13 1	VGW030 - G - 2PQ 13 1
	Rating	300#	300#
	Material	SA 105 13 2	SA 105 13 2
	End Preparation	Butt Weld	Butt Weld
	Normal Oper. Press.-psi	350	350
	Max. Diff. Press.-psi	350	350
	Temperature Range - F	40 - 170	40 - 170
	Maximum Flow	8400 gpm	8400 gpm
	Design Pressure - psig.	500	500
	Design Temperature - F	358	358
	Pipe Schedule	XS 1 1	XS 1 1
	"C" Bore	15.084" 1 1	15.084" 1 1
	Trim	STELLITE 1 2	STELLITE 1 2
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	Cl. H(R)	Cl. H(R)
	Normal Ambient Temp.-C	65.5	65.5
	Location	Outside Pri. Containment	OUTSIDE Pri. Containment 1 4
	No. Limit Switch Contacts		
	Close	4 Open 4 Closed	4 Open 4 Closed
	Open	4 Open 4 Closed	4 Open 4 Closed
	Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
		2) Low Seat Leakage	2) Low Seat Leakage
		3) Outside Iso.	3) Outside Iso.

REV. 3 CCI 191477
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P 304R

J.O. NO. 12177

CLIENT Niagara Mohawk Power Corporation

PROJECT Nine Mile Point - Unit No. 2 BY: DP DATE

	2 RHS - MOV 113	2 RHS - MOV 112
S & W Mark No.		
GE #	E12-F008	E12-F009
Valve		
Quantity	One	One
Size	20 Inch	20 Inch
Type	Gate	Gate
Service -	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VG1090 - F - 120 [3][1]	VG1090 - F - 1MQ [3][1]
Rating	900#	900#
Material	SA 105 [3]	SA-105 [3]
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1000	1000
Max. Diff. Press.-psi	150 [R2]	150 [R2]
Temperature Range - °F	70 - 540	70 - 540
Maximum Flow	14,900 gpm	14,900 gpm
Design Pressure - psig.	1250	1250
Design Temperature - F	575	575
Pipe Schedule Inlet:	Sch. 80	Sch. 80
Outlet:	XS	Sch. 90
"C" Bore Inlet:	18.155"	18.155"
Outlet:	19.094"	18.155"
Trim	Stellite	Stellite
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Prl. Containment	Inside Prl. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Inside Iso.
	4) Time to operate:	4) Inlet transition piece required.
	a) Close - 29 sec (max)	5) Time to operate:
	b) Open - 29 sec (max)	a) Close - 29 sec (max)
		b) Open - 29 sec (max)

REV. 3	CC: 10/17/77
REV. 2	J
REV. 1	

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4 - 32000
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: GJS

S & W Mark No.	2 FWS - MOV 21A	2 FWS - MOV 21B
Valve		
Quantity	One	One
Size	24 Inch	24 Inch
Type	Gate	Gate
Service	Shutoff	Shutoff
Fluid	Water	Water
S & W Description No.	VGW090 - F - 1YQ |R2	VGW090 - F - 1YQ |R1
Rating	900#	900#
Material	SA 105 |3	SA 105 |3
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1380	1380
Max. Diff. Press.-psi	1380	1380
Temperature Range - °F	550	550
Maximum Flow	17,750 gpm	17,750 gpm
Design Pressure - psig.	2200	2200
Design Temperature - F	450	450
Pipe Schedule	Sch. 160	Sch. 160
"C" Bore	19.859"	19.859"
TRIM	STELLITE |2	STELLITE |2
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power - Volts / Phase / Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Outside Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
	2) Low Seat Leakage	2) Low Seat Leakage
	3) Outside Iso.	3) Outside Iso.

REV. 3 CAT RIGHT
REV. 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3SSSS
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2ICS-MOV200	
Valve		
Quantity	ONE	
Size	1 INCH	
Type	GLOBE	
Service	THROTTLING	
Fluid	STEAM	
S & W Description No.	V0S150-F-2Q	
Rating	1500#	
Material	SA 105	
End Preparation	SOCKET WELD	
Normal Oper. Press. - psi	1140	
Max. Diff. Press. - psi	1140	
Temperature Range - F	70-560	
Maximum Flow		
Design Pressure - psig	1375	
Design Temperature - F	586	
Pipe Schedule	160	
Pipe Bore	NA	
Motor Operator		
Enclosure	NEMA 4	
Power-Volts/Phase/Hz	120 V D.C.	
Insulation Class	CL H(R)	
Normal Ambient Temp.-C	65.5	
Location	INSIDE PRI. CTMT.	
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	
Open	4 OPEN 4 CLOSED	
Special Requirements	1) ACTIVE VALVE	
	2) LOW SEAT LEAKAGE	

REV. 3
REV 2
REV. 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 RHS - MOV 26A	2 RHS - MOV 26B
Valve		
Quantity	ONE	ONE
Size	1 INCH	1 INCH
Type	GLOBE	GLOBE
Service	THROTTLING	THROTTLING
Fluid	WATER	WATER
S & W Description No.	V05150-F-2Q	V05150-F-2Q
Rating	1500#	1500#
Material	SA 105	SA 105
End Preparation	SOCKET WELD	SOCKET WELD
Normal Oper. Press. - psi	45	45
Max. Diff. Press. - psi	500	500
Temperature Range - F	70-540	70-540
Maximum Flow		
Design Pressure - psig	500	500
Design Temperature - F	575	575
Pipe Schedule	80	80
Pipe Bore	NA	NA
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class		
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI. CTMT.	OUTSIDE PRI. CTMT.
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		
Rev. 3		
Rev 2		
Rev. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3 WWWW
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 RHS - MOV 27A	2 RHS - MOV 27B
Valve		
Quantity	ONE	ONE
Size	1 INCH	1 INCH
Type	GLOBE	GLOBE
Service	THROTTLING	THROTTLING
Fluid	WATER	WATER
S & W Description No.	VOS150-F-20	VOS150-F-20
Rating	1500#	1500#
Material	SA 105	SA 105
End Preparation	SOCKET WELD	SOCKET WELD
Normal Oper. Press. - psi	45	45
Max. Diff. Press. - psi	500	500
Temperature Range - F	70-540	70-540
Maximum Flow		
Design Pressure - psig	500	500
Design Temperature - F	575	575
Pipe Schedule	80	80
Pipe Bore	NA	NA
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	STD CL B	STD CL B
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI CTMT	OUTSIDE PRI CTMT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		
Rev 3		
Rev 2		
Rev. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4-3YYYY
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: JJP

	2MSS-MOV30A	2MSS-MOV30B
S & W Mark No.		
Valve		
Quantity	ONE	ONE
Size	1½ INCH	1½ INCH
Type	GLOBE	GLOBE
Service	SHUTOFF	SHUTOFF
Fluid	STEAM/CONDENSATE	STEAM/CONDENSATE
S & W Description No.	V05150-F-1Q	V05150-F-1Q
Rating	1500 #	1500#
Material	SA 105	SA 105
End Preparation	SOCKET WELD	SOCKET WELD
Normal Oper. Press. - psi	997	997
Max. Diff. Press. - psi	1220	1220
Temperature Range - F	65-568	65-568
Maximum Flow		
Design Pressure - psig	1375	1375
Design Temperature - F	586	586
Pipe Schedule	160	160
Pipe Bore	NA	NA
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL H(R)	CL H(R)
Normal Ambient Temp.-C	65.5	65.5
Location		
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		
	DELETE	DELETE

Rev 3
Rev 2
Rev 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

PAGE 4-3AAAAA
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 MSS-MOV 30C	2 MSS-MOV 30D
Valve		
Quantity	ONE	ONE
Size	1½ INCH	1½ INCH
Type	GLOBE	GLOBE
Service	SHUTOFF	SHUTOFF
Fluid	STEAM / CONDENSATE	STEAM / CONDENSATE
S & W Description No.	VOS150-F-1Q	VOS150-F-1Q
Rating	1500#	1500#
Material	SA 105	SA 105
End Preparation	SOCKET WELD	SOCKET WELD
Normal Oper. Press. - psi	997	997
Max. Diff. Press. - psi	1220	1220
Temperature Range - F	65-568	65-568
Maximum Flow		
Design Pressure - psig	1375	1375
Design Temperature - F	586	586
Pipe Schedule	160	160
Pipe Bore		
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL H (R)	CL H (R)
Normal Ambient Temp.-C	65.5	65.5
Location		
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		
	DELETE	DELETE

Rev 3
Rev 2
Rev 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3-CCCC
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

	S & W Mark No.	2 DER-MOV 128	2 DER-MOV 129
	Valve		
	Quantity	ONE	ONE
	Size	2 INCH	2 INCH
	Type	GLOBE	GLOBE
	Service	THROTTLE-OPEN-CLOSE	THROTTLE
	Fluid	WATER	WATER
	S & W Description No.	V05150-F-1Q	V05150-F-1Q
	Rating	1500#	1500#
	Material	SA 105 GR II	SA 105 GR II
	End Preparation	SOCKET WELD	SOCKET WELD
	Normal Oper. Press. - psi	1050	1050
	Max. Diff. Press. - psi	1050	1050
	Temperature Range - F	40-575	40-575
	Maximum Flow	200	200
	Design Pressure - psig	1250	1250
	Design Temperature - F	575	575
	Pipe Schedule	80	80
	Pipe Bore		
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class		
	Normal Ambient Temp.-C	65.5	65.5
	Location	OUTSIDE PRI CTMT.	OUTSIDE PRI CTMT.
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements		
	REV 3		
	REV 2		
	REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3EEEEE
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 RHS-MOV 67A	2 RHS-MOV 67B
Valve		
Quantity	ONE	ONE
Size	2 INCH	2 INCH
Type	GLOBE	GLOBE
Service	THROTTLING	THROTTLING
Fluid	WATER	WATER
S & W Description No.	V05150-F-1Q	V05150-F-1Q
Rating	1500#	1500#
Material	SA 105	SA 105
End Preparation	SOCKET WELD	SOCKET WELD
Normal Oper. Press. - psi	1230	1230
Max. Diff. Press. - psi	1230	1230
Temperature Range - F	70-540	70-540
Maximum Flow	150 GPM [4]	150 GPM [4]
Design Pressure - psig	1550	1550
Design Temperature - F	575	575
Pipe Schedule	160	160
Pipe Bore		
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL H(R)	CL H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	INSIDE PRI CTMT	INSIDE PRI CTMT.
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements	1) ACTIVE VALVE 2) LOW SEAT LEAKAGE 3) CONT. ISO. VALVE [4]	1) ACTIVE VALVE 2) LOW SEAT LEAKAGE 3) CONT. ISO. VALVE [4]

Rev 3
Rev 2
Rev 1

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3GGGGG
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 SNP-MOV 15A	2 SWP-MOV 15B
Valve		
Quantity	ONE	ONE
Size	2½ INCH	2½ INCH
Type	GATE	GATE
Service	SHUT OFF	SHUTOFF
Fluid	WATER	WATER
S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	BUTTWELD	BUTTWELD
Normal Oper. Press. - psi	78	78
Max. Diff. Press. - psi	95	95
Temperature Range - F	32-77	32-77
Maximum Flow	77 GPM	77 GPM
Design Pressure - psig	150	150
Design Temperature - F	130	130
Pipe Schedule	STD	STD
Pipe Bore "B"	2.469	2.469
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL H(R)	CL H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI CTMT	OUTSIDE PRI CTMT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements	1/ ACTIVE VALVE	1/ ACTIVE VALVE
rev 3		
rev 2		
rev 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET BY ENGINEERS

SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 SWP-MOV 21A	2 SWP-MOV 21B
Valve		
Quantity	ONE	ONE
Size	3 INCH	3 INCH
Type	GATE	GATE
Service	SHUTOFF	SHUTOFF
Fluid	WATER	WATER
S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	BUTTWELD	BUTTWELD
Normal Oper. Press. - psi	70	70
Max. Diff. Press. - psi	108	108
Temperature Range - F	32-77	32-77
Maximum Flow	300 GPM	300 GPM
Design Pressure - psig	150	150
Design Temperature - F	130	130
Pipe Schedule	STD	STD
Pipe Bore "B"	3.068	3.068
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	CL H(R)	CL H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI. CTMT	OUTSIDE PRI CTMT
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements	1) ACTIVE VALVE	1) ACTIVE VALVE
Rev 3		
Rev 2		
Rev 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3KKKKK
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: JJP

	S & W Mark No.	2 CCP-MOV 93A	2 CCP-MOV 93B
	Valve		
	Quantity	ONE	ONE
	Size	6 INCH	6 INCH
	Type	GATE	GATE
	Service	SHUTOFF	SHUTOFF
	Fluid	WATER	WATER
	S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
	Rating	150#	150#
	Material	SA 105	SA 105
	End Preparation	BUTTWELD	BUTTWELD
	Normal Oper. Press. - psi	100	100
	Max. Diff. Press. - psi	150	150
	Temperature Range - F	40-160	40-160
	Maximum Flow	600	600
	Design Pressure - psig	200	200
	Design Temperature - F	250	250
	Pipe Schedule	STD	STD
	Pipe Bore "C"	6.094	6.094
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	STD CL B	STD CL B
	Normal Ambient Temp.-C	65.5	65.5
	Location	OUTSIDE PRI CTMT	OUTSIDE PRI CTMT
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements		
	Rev 3		
	Rev 2		
	Rev 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3MMMMM
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE 1

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: JJP

1	S & W Mark No.	2 CCP - MOV 265	
2			
3	Valve		
4	Quantity	ONE	
5	Size	8 INCH	
6	Type	GATE	
7	Service	SHUTOFF	
8	Fluid	WATER	
9	S & W Description No.	VGW015-P-2KQ 14	
10	Rating	150#	
11	Material	SA 105	
12	End Preparation	BUTTWELD	
13	Normal Oper. Press. - psi	100	
14	Max. Diff. Press. - psi	150	
15	Temperature Range - F	40-160	
16	Maximum Flow	1200 GPM	
17	Design Pressure - psig	200	
18	Design Temperature - F	250	
19	Pipe Schedule	STD	
20			
21	Pipe Bore "C"	8.020	
22			
23			
24			
25	Motor Operator		
26	Enclosure	NEMA 4	NEMA 4
27	Power-Volts/Phase/Hz	575/3/60	575/3/60
28	Insulation Class	CL H(R)	CL H(R)
29	Normal Ambient Temp.-C	65.5	65.5
30			
31			
32	Location	OUTSIDE PRI. CTMT	
33			
34			
35	No. Limit Switch Contacts		
36	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
37	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
38			
39			
40			
41	Special Requirements	1/ ACTIVE VALVE	
42		2/ LOW SEAT LEAKAGE	
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
	Rev 3		
	Rev 2		
	Rev. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-300000
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

S & W Mark No.	2 SWP-MOV 66A	2 SWP-MOV 66B.
Valve		
Quantity	ONE	ONE
Size	8 INCH	8 INCH
Type	GATE	GATE
Service	SHUTOFF	SHUTOFF
Fluid	WATER	WATER
S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
Rating	150#	150#
Material	SA 105	SA 105
End Preparation	BUTTWELD	BUTTWELD
Normal Oper. Press. - psi	91	91
Max. Diff. Press. - psi	108	108
Temperature Range - F	32-77	32-77
Maximum Flow	800 GPM	800 GPM
Design Pressure - psig	150	150
Design Temperature - F	130	130
Pipe Schedule	STD	STD
Pipe Bore "C"	8.020"	8.020"
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	STD CL B	STD CL B
Normal Ambient Temp.-C	65.5	65.5
Location	OUTSIDE PRI. CTMT.	OUTSIDE PRI. CTMT.
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements		
Rev 3		
Rev 2		
Rev. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3QQQQ
SPEC. NO. NMP2-P 304R
J.O. NO: 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: JJP

	S & W Mark No.	2 SWP-MOV 94A	2 SWP-MOV 94B
	Valve		
	Quantity	ONE	ONE
	Size	8 INCH	8 INCH
	Type	GATE	GATE
	Service	SHUTOFF	SHUTOFF
	Fluid	WATER	WATER
	S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
	Rating	150#	150#
	Material	SA105	SA105
	End Preparation	BUTTWELD	BUTTWELD
	Normal Oper. Press. - psi	91	91
	Max. Diff. Press. - psi	108	108
	Temperature Range - F	32-77	32-77
	Maximum Flow	800	800
	Design Pressure - psig	150	150
	Design Temperature - F	130	130
	Pipe Schedule	STD	STD
	Pipe Bore "C"	8.020	8.020
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	STD Cl B	STD Cl B
	Normal Ambient Temp.-C	65.5	65.5
	Location	OUTSIDE PRI. CTMT.	OUTSIDE PRI CTMT.
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements		
	rev 3		
	rev 2		
	rev 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-355555
SPEC. NO. NMP2-P304R
J.O. NO. 12177
DATE

CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2 BY: JJP

	S & W Mark No.	2SWP-MOV95A	2SWP-MOV95B
	Valve		
	Quantity	ONE	ONE
	Size	8 INCH	8 INCH
	Type	GATE	GATE
	Service	SHUTOFF	SHUTOFF
	Fluid	WATER	WATER
	S & W Description No.	VGW015-P-3KQ	VGW015-P-3KQ
	Rating	150#	150#
	Material	SA 105	SA 105
	End Preparation	BUTTWELD	BUTTWELD
	Normal Oper. Press. - psi	91	91
	Max. Diff. Press. - psi	108	108
	Temperature Range - F	32-77	32-77
	Maximum Flow	800 GPM	800 GPM
	Design Pressure - psig	150	150
	Design Temperature - F	130	130
	Pipe Schedule	STD.	STD
	Pipe Bore "C"	8.020	8.020
	Motor Operator		
	Enclosure	NEMA 4	NEMA 4
	Power-Volts/Phase/Hz	575/3/60	575/3/60
	Insulation Class	STD CL B	STD CL B
	Normal Ambient Temp.-C	65.5	65.5
	Location	OUTSIDE PRI. CTMT.	OUTSIDE PRI. CTMT.
	No. Limit Switch Contacts		
	Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
	Special Requirements		
	Rev 3		
	Rev 2		
	Rev 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3CCCC
SPEC. NO. NMP2-P 304R
J.O. NO. 12177
DATE

CLIENT Niagara Mohawk Power Corporation
PROJECT Nine Mile Point - Unit No. 2 BY: JG

S & W Mark No.	2RHS - MOV 24A	2 - MOV
GE #	E12-F042A	
Valve		
Quantity	One	One
Size	12 Inch	
Type	Gate	
Service	Shutoff	Shutoff
Fluid	Water	
S & W Description No.	VGW1000 - F - 12Q 3 1	
Rating	900#	
Material	SA 105 3	
End Preparation	Butt Weld	Butt Weld
Normal Oper. Press.-psi	1000	
Max. Diff. Press.-psi	750 2	
Temperature Range - °F	70 - 540	
Maximum Flow	8400	Intentionally
Design Pressure - psig.	1250	Left
Design Temperature - F	575	Blank
Pipe Schedule Inlet:	Std.	
Outlet:	Sch. 80	
"C" Bore Inlet:	12.053"	
Outlet:	11.507"	
Trim	Stellite	
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	Cl. H(R)	Cl. H(R)
Normal Ambient Temp.-C	65.5	65.5
Location	Outside Pri. Containment	Pri. Containment
No. Limit Switch Contacts		
Close	4 Open 4 Closed	4 Open 4 Closed
Open	4 Open 4 Closed	4 Open 4 Closed
Special Requirements	1) ACTIVE VALVE	
	2) Low Seat Leakage	
	3) Outside Iso.	
	4) Time to operate:	
	Close - 20 SEC 4	
	Open - 20 SEC 4	
REV. 3 CC' 10/1/??		
REV. 2		
REV. 1		

STONE & WEBSTER ENGINEERING CORPORATION

MOTOR OPERATED VALVE DATA SHEET
BY ENGINEERS

PAGE 4-3TTTT
SPEC. NO. NMP2-P
J.O. NO. 12177
DATE 12/7/79

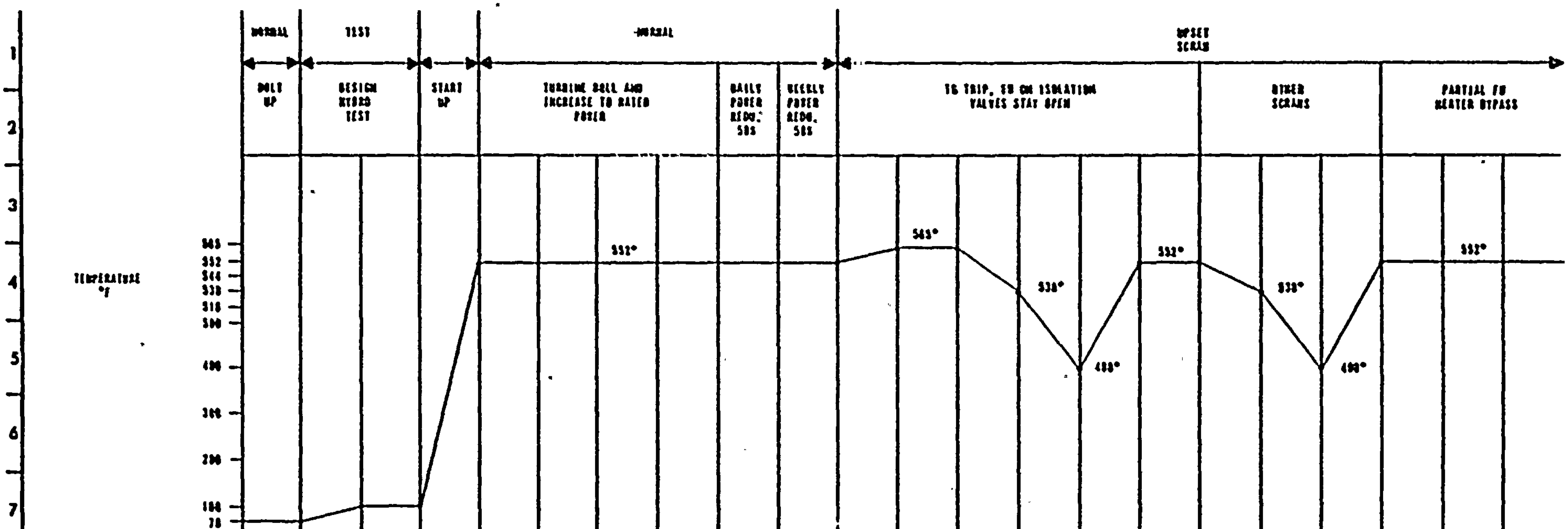
CLIENT NIAGARA MOHAWK CORPORATION
PROJECT NINE MILE POINT - UNIT NO. 2
BY: JJP

S & W Mark No.	2 ICS - MOV 128 (E51 - F063)	
Valve		
Quantity	ONE	
Size	10 INCH	
Type	GATE	
Service	SHUTOFF	
Fluid	STEAM	
S & W Description No.	VGW090-F-1MQ	
Rating	900#	
Material	SA 105	
End Preparation	BUTTWELD	
Normal Oper. Press. - psi	1140	
Max. Diff. Press. - psi	1140	
Temperature Range - F	70 - 560	
Maximum Flow	207,300 #/HR	
Design Pressure - psig	1250	
Design Temperature - F	575	
Pipe Schedule	SCH 80	
Pipe Bore ("C" BORE)	9.671"	
Motor Operator		
Enclosure	NEMA 4	NEMA 4
Power-Volts/Phase/Hz	575/3/60	575/3/60
Insulation Class	RH	
Normal Ambient Temp.-C	65.5	65.5
Location	INSIDE PRI. CONTAINMENT	
No. Limit Switch Contacts		
Close	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Open	4 OPEN 4 CLOSED	4 OPEN 4 CLOSED
Special Requirements (1)	ACTIVE VALVE	
(2)	LOW SEAT LEAKAGE	
(3)	INSIDE ISOLATION	
(4)	TIME TO OPERATE: a/ CLOSE 15 SEC (MAX) b/ OPEN 15 SEC (MAX)	
(5)	TEST CONN. REQ'D	

REV 3

THERMAL TRANSIENT INDEX

Number	Valve Mark No.
1,2, and 3	2ICS-MOV121, 2ICS-MOV128
4 and 5	2CSL-MOV104 (solid line)
6 and 7	2RHS-MOV24A, B, C (solid line)
8, 9, 10, and 11	2RHS-MOV40A, B (dashed line) 2RHS-MOV112 (solid line) 2RHS-MOV113 (solid line) 2RHS-MOV67A, B (dashed line)
12, 13, 14, and 15	2FWS-MOV21A, B (solid line)
16, 17, 18, and 19	2MSI-MOV1A, B 2MSI-MOV2A, B 2MSS-MOV111 2MSS-MOV112 2MSS-MOV30A, B, C, D
20, 21, and 22	2WCS-MOV101 (solid line) 2WCS-MOV104 (solid line) 2WCS-MOV105 (solid line) 2WCS-MOV102 (solid line) 2WCS-MOV103 (solid line) 2WCS-MOV112 (solid line) 2DER-MOV128 (solid line) 2DER-MOV129 (solid line)
23 and 24	2WCS-MOV200
25 and 26	2RHS-MOV104 (dashed line) 2ICS-MOV126 (dashed line)



EVENT NO	1	2	2	3	4	4	4	4	5&7	8	8&10	8&10	8&10	8&10	8&10	8&10	11	11	11	9	9	9
DURATION OF TEMP	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	-	5 SECS	-	-	-	-	-	-	-	INDEF	INDEF	INDEF
RATE OF TEMP CHANGE - °F/HR	-	80	-	100	-	-	-	-	-	-	4000	-	6500	100	100	-	3360	100	100	-	-	-
EXPECTED NO OF CYCLES	-	130	130	120	120	120	120	120	10,400	2000	50	50	50	50	50	50	140	140	140	70	70	70
RPV PRESSURE PSIG	0	1250 / 0	0 / 1250	1000 / 0	1000	1000	1000	1000	1000	1000	1125 / 1000	1125	838 / 1125	240 / 838	1000 / 240	1000	838 / 1000	240 / 838	1000 / 240	1000	1000	1000
VELOCITY IN 10" STEAM LINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTES:

(1) TRANSIENT IS APPLICABLE TO THE FOLLOWING:
(a) 2ICS-018-78-1, 2ICS-018-135-1 (b) 2ICS*MOV120, 2ICS*MOV128, 2ICS*MOV121 AND 2216.

(2) THIS HISTOGRAM IS DEVELOPED BASED ON THE FOLLOWING:
GE SPEC. 22A2807, REV 5 AND REACTOR VESSEL THERMAL CYCLES 782E873, REV 1.

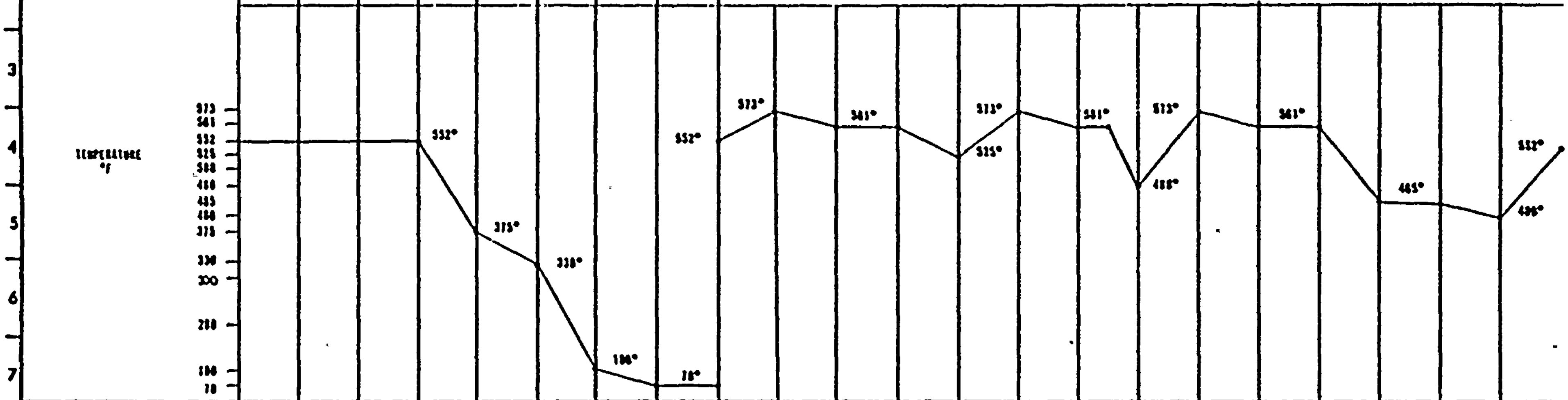
(3) VALVES 2ICS*MOV120 AND 2ICS*MOV121 ARE NORMALLY KEPT OPEN VALVES AND LINES 78 AND 135 ARE FILLED AND PRESSURIZED WITH STEAM.

PRELIMINARY

REACTOR CORE ISOLATION COOLING
STEAM SUPPLY LINE
THERMAL TRANSIENT
NMP2 NMPC
Stone & Webster Engineering Corporation
12177-SK-A103A-1

NO. 1

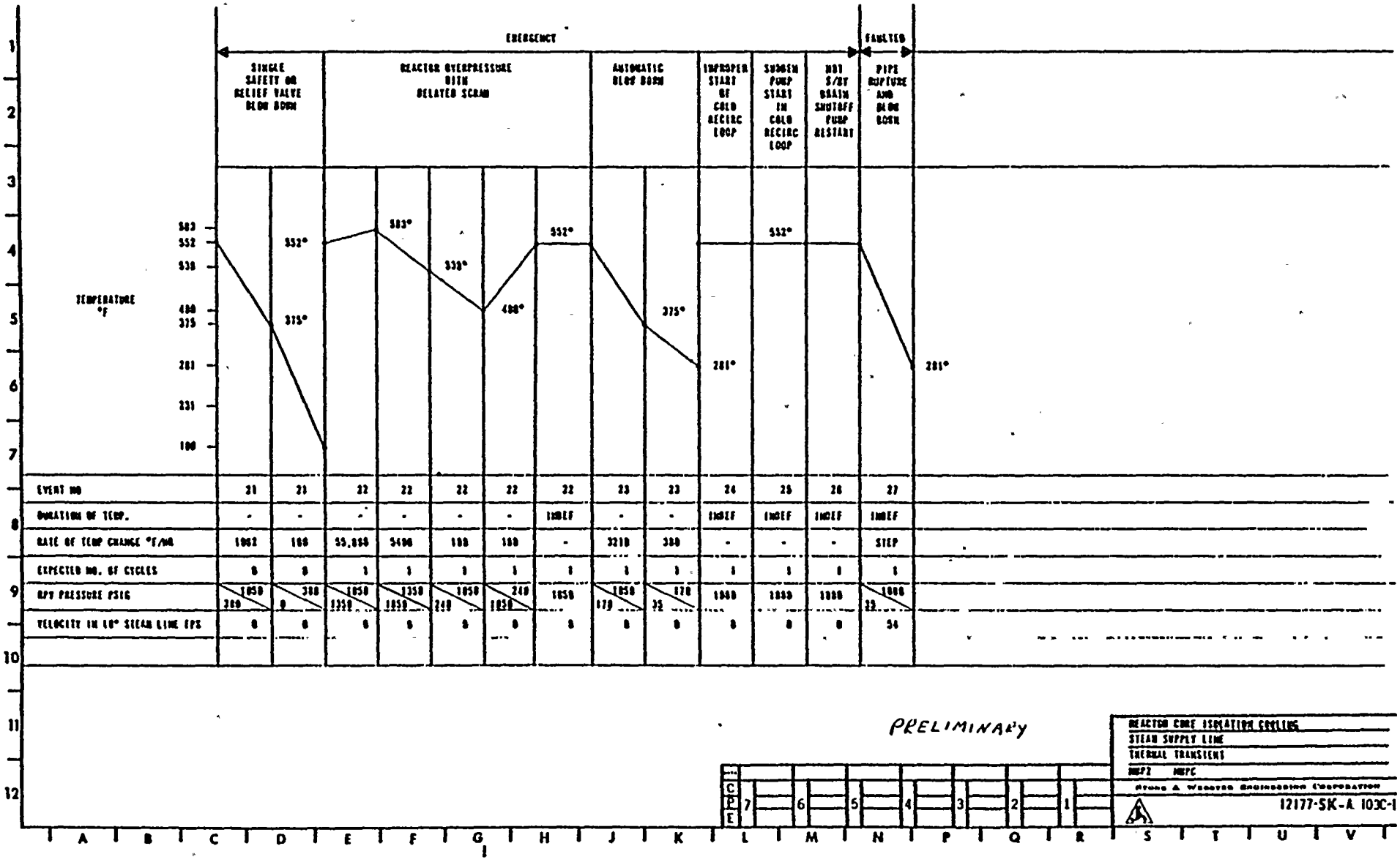
	NORMAL	NORMAL							UPSET													
				SHUTDOWN					LOSS OF FEEDWATER PUMPS, MAIN STEAM ISOLATION VALVES CLOSED													
	RATED POWER NORMAL OPERA.	REDUC. TO 0% POWER	HOT S/BY	PRIOR TO FLOOD.	VESSEL FLOOD	SHUT DOWN	VESSEL UNBOLT	REFUEL-ING														



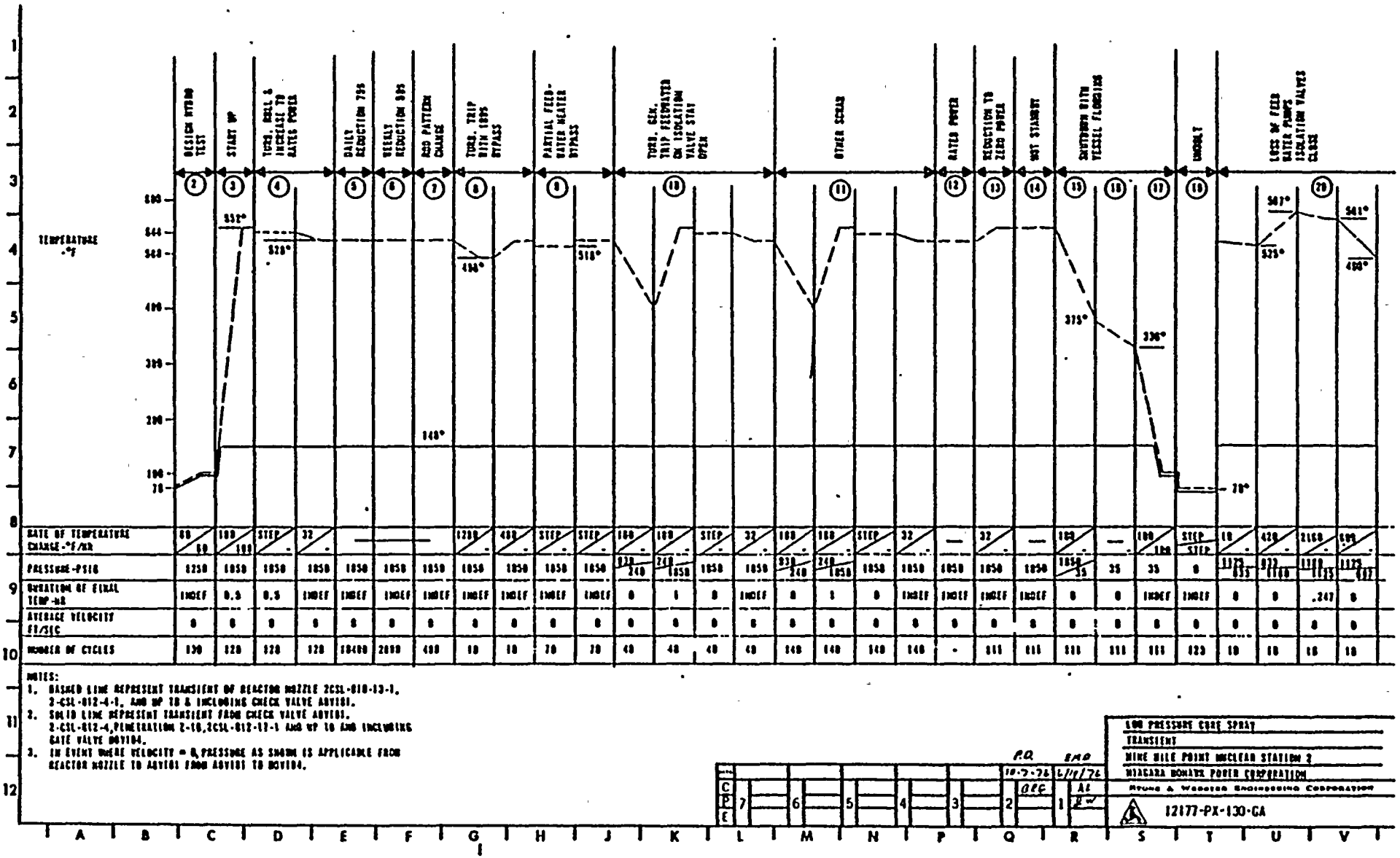
EVENT NO	12	13	14	15	16	17	18	19	20	20	20	20	20	20	20	20	20	20	20	20	20	20
DURATION OF TEMP.	INDEF	INDEF	INDEF	-	-	-	INDEF	INDEF	-	-	2 SECS	-	-	-								
RATE OF TEMP CHANGE °F/HR	-	-	-	100	220	100	STEP	-	STEP	4320	-	240	480	4320	- | 810	825	4320	-	850	-	100	100
EXPECTED NO OF CYCLES	-	111	111	111	111	111	123	-	10	10	10	10	10	10	10	10	10	10	10	10	10	10
RPV PRESSURE PSIG	1000	1030	1050	35 / 1000	35	35	0	0	1100 / 1000	1125 / 1100	1125	875 / 1125	1100 / 875	1125 / 1100	1125 | 1125 / 687	1100 / 687	1125 / 1100	1125	570 / 1125	570	233 / 570	1050 / 233
VELOCITY IN 10" STEAM LINE (FPS)	0	0	0	0	0	0	0	0	0	54	54	54	54	54	54	54	54	0	0	0	0	0

REACTOR CORE ISOLATION COOLING
STEAM SUPPLY LINE
THERMAL TRANSIENT
NMP2 NMPC
Stone & Webster Engineering Corporation
12177-SK-A103B-1

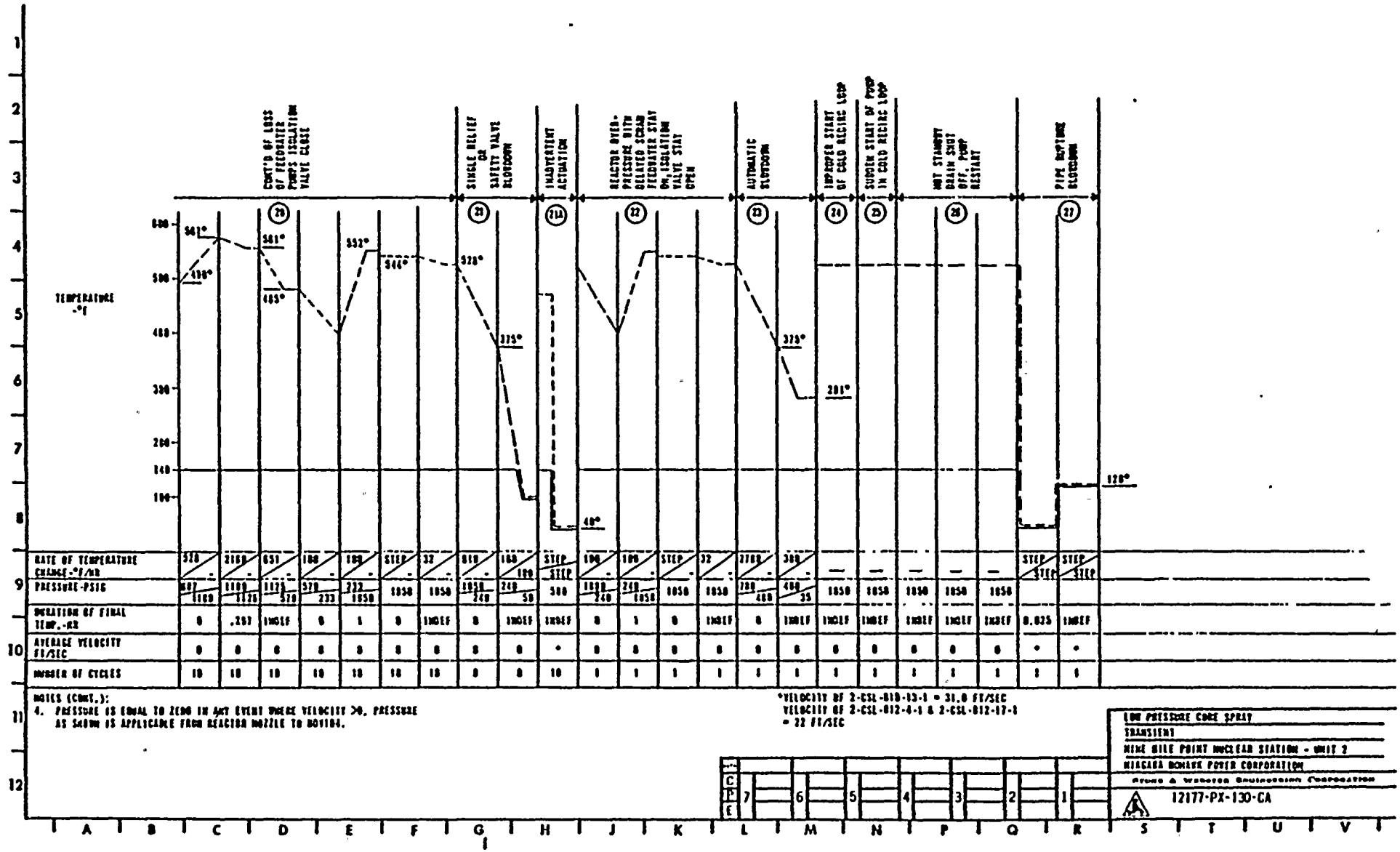
NO. 2


EMERGENCY
FAULTED
SINGLE SAFETY OR RELIEF VALVE BLOW DOWN
REACTOR OVERPRESSURE WITH DELAYED SCRAM
AUTOMATIC BLOW DOWN
IMPROPER START OF COLD RECIRC LOOP
SUDDEN PUMP START IN COLD RECIRC LOOP
HOT S/BY BRAIN SHUTOFF PUMP RESTART
PIPE RUPTURE AND BLOW DOWN
TEMPERATURE °F
583
552
538
480
315
281
231
100
552°
315°
583°
538°
480°
552°
375°
281°
552°
281°
EVENT NO
DURATION OF TEMP.
RATE OF TEMP CHANGE °F/HR
EXPECTED NO. OF CYCLES
RPV PRESSURE PSIG
VELOCITY IN 10" STEAM LINE FPS
INDEF
STEP
PRELIMINARY
REACTOR CORE ISOLATION COOLING
STEAM SUPPLY LINE
THERMAL TRANSIENTS
12177-SK-A 103C-1

NO. 3


TEMPERATURE °F
DESIGN HYDRO TEST
START UP
TURB. ROLL & INCREASE TO RATED POWER
DAILY REDUCTION 75%
WEEKLY REDUCTION 50%
ROD PATTERN CHANGE
TURB. TRIP WITH 100% BYPASS
PARTIAL FEED-WATER HEATER BYPASS
TURB. GEN. TRIP ISOLATION OR ISOLATION VALVE STAY OPEN
OTHER SCRAM
RATED POWER
REDUCTION TO ZERO POWER
HOT STANDBY
SHUTDOWN WITH VESSEL FLOODING
UNBOLT
LOSS OF FEED WATER PUMPS ISOLATION VALVES CLOSE
RATE OF TEMPERATURE CHANGE °F/HR
PRESSURE-PSIG
DURATION OF FINAL TEMP-HR
AVERAGE VELOCITY FT/SEC
NUMBER OF CYCLES
NOTES:
1. DASHED LINE REPRESENT TRANSIENT OF REACTOR NOZZLE 2CSL-010-13-1, 2-CSL-012-4-1, AND UP TO & INCLUDING CHECK VALVE ADVIBI.
2. SOLID LINE REPRESENT TRANSIENT FROM CHECK VALVE ADVIBI. 2-CSL-012-4, PENETRATION 2-16, 2CSL-012-13-1 AND UP TO AND INCLUDING GATE VALVE MOV104.
3. IN EVENT WHERE VELOCITY = 0, PRESSURE AS SHOWN IS APPLICABLE FROM REACTOR NOZZLE TO ADVIBI FROM ADVIBI TO MOV104.
LOW PRESSURE CORE SPRAY
TRANSIENT
NINE MILE POINT NUCLEAR STATION 2
NIAGARA MOHAWK POWER CORPORATION
BECHTEL POWER CORPORATION
12177-PX-130-GA

NO. 4

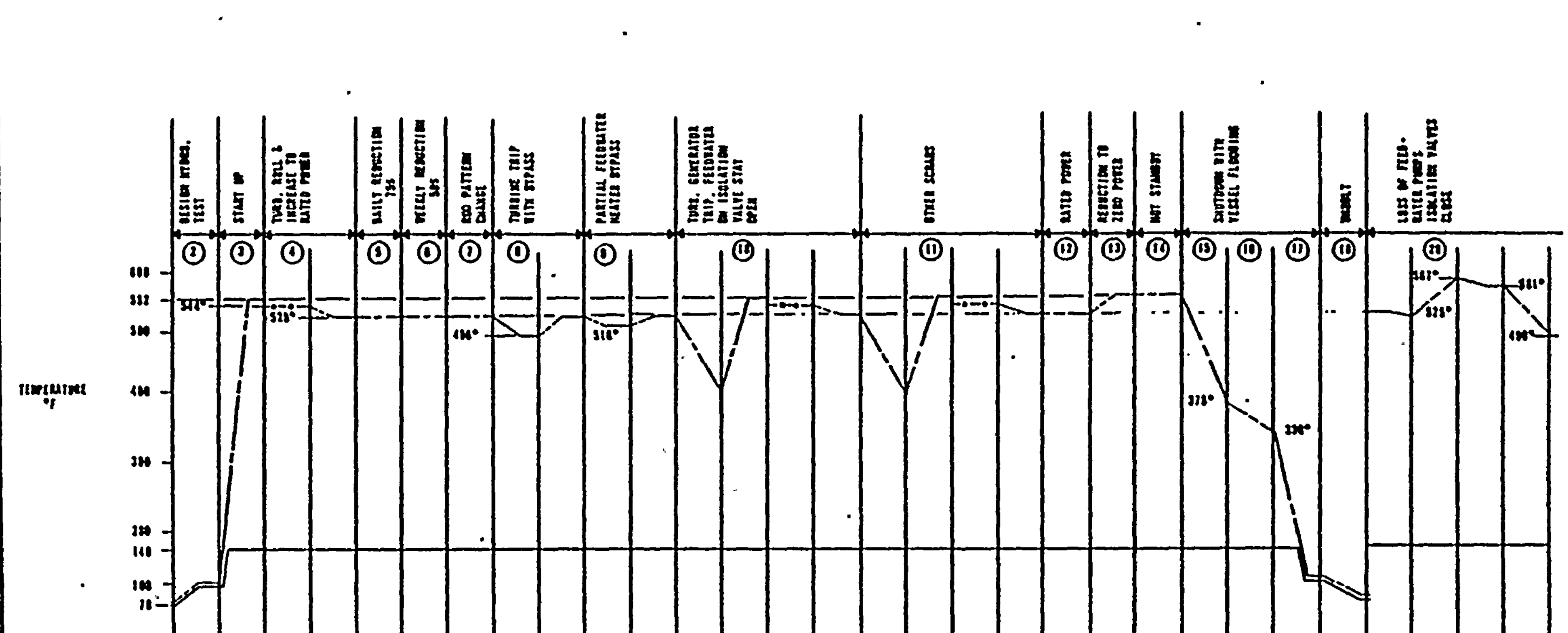


NOTES (CONT.):
4. PRESSURE IS EQUAL TO ZERO IN ANY EVENT WHERE VELOCITY >0. PRESSURE AS SHOWN IS APPLICABLE FROM REACTOR NOZZLE TO BOVINE.

*VELOCITY OF 2-CSL-810-13-1 = 31.0 FT/SEC
VELOCITY OF 2-CSL-812-4-1 & 2-CSL-812-17-1 = 22 FT/SEC

LOW PRESSURE CORE SPRAY TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Bechtel Power Corporation
Bechtel & Western Engineering Corporation
12177-PX-130-CA

NO. 5



RATE OF TEMP. CHANGE - °F/HR	65/80	100/100	STEP/-	32/-	—	—	—	1200/-	400/-	400/-	150/-	100/-	100/-	STEP/-	32/-	100/-	100/-	STEP/-	32/-	—	32/-	—	100/-	270/-	100/100	100/100	20/-	400/-	4320/-	600/-
PRESSURE-PSIG SEE NOTE 4&5	1250	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	830/240	830/1050	1050	1050	830/240	240/1050	1050	1050	1050	1050	1050	1050/185	185/185	185/0	10	1100/833	833/1100	1100	1173/807
DURATION OF FINAL TEMP. - HR	INDEF	1	0	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	INDEF	0	1	0	INDEF	0	1	0	INDEF	INDEF	INDEF	INDEF	0	0	INDEF	INDEF	0	0	0.25	0
AVERAGE VELOCITY FT/SEC	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NUMBER OF CYCLES	130	120	120	120	10,000	2000	400	10	10	70	70	40	40	40	40	140	140	140	140	-.	111	111	111	111	111	123	10	10	10	10

NOTES:
1. DASHED LINE REPRESENTS TRANSIENT OF RPV NOZZLE 2-RHS-012-8-1 & 2-RHS-012-125-1, 2-RHS-012-103-1, 2RHS*AOV16A, 2RHS*AOV16B, 2RHS*AOV16C, 2RHS*MCV33A, 2RHS*MCV33B AND 2RHS*MCV33C.
2. SOLID LINE REPRESENTS TRANSIENT FROM AOV16A UP TO AND INCLUDING MOV24A FROM AOV16B UP TO AND INCLUDING MOV24B AND FROM AOV16C UP TO AND INCLUDING MOV24C AND PENETRATIONS Z-8A, Z-8B & Z-8C.
(NOTES CONT. ON SHT. 2 OF 2)

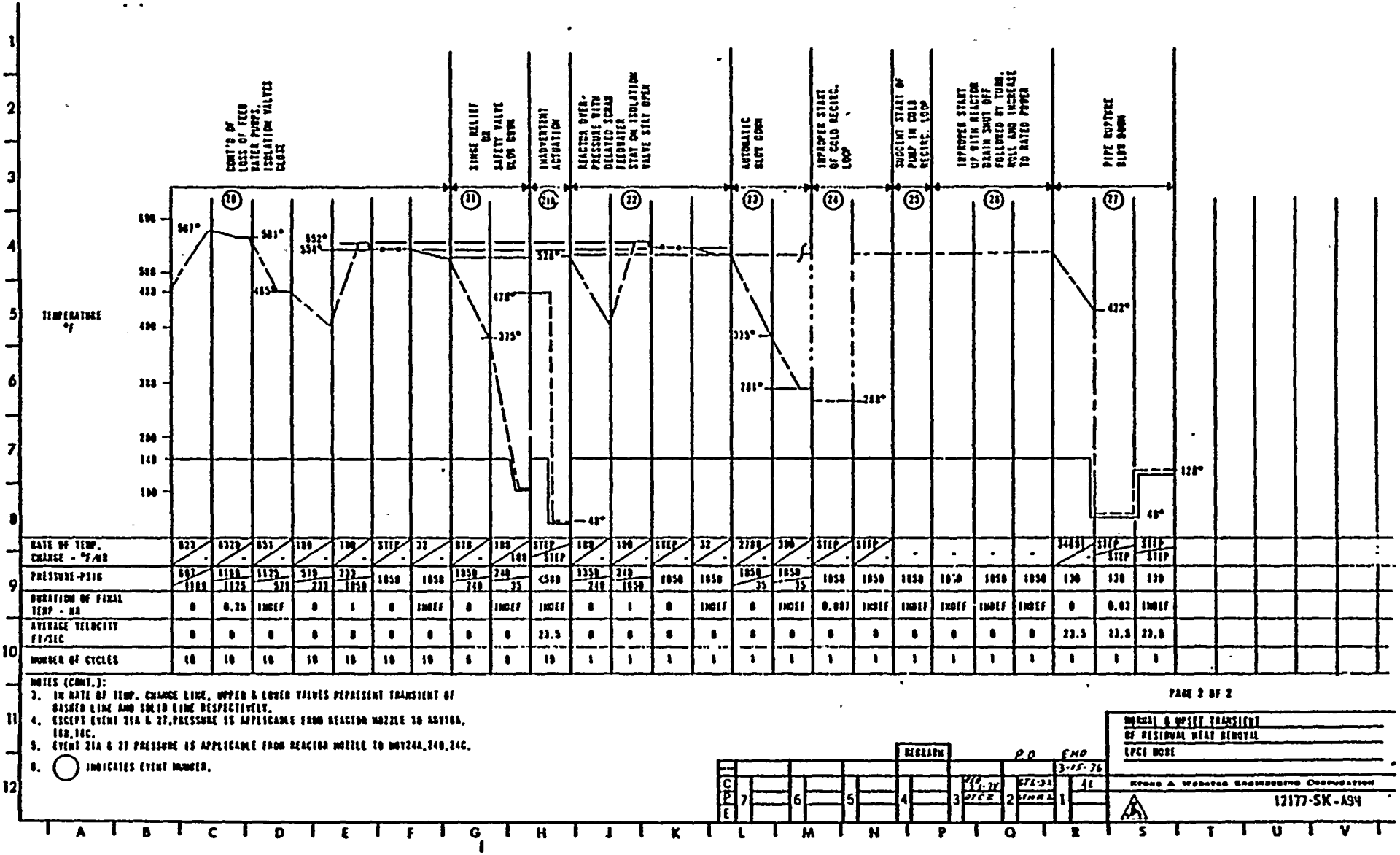
NORMAL & UPSET TRANSIENT OF RESIDUAL HEAT REMOVAL
LPCI MODE

PD EMP 3-15-76 AL

Stone & Webster Engineering Corporation

12177-SK-A94

NO. 6



NOTES (CONT.):

3. IN RATE OF TEMP. CHANGE LINE, UPPER & LOWER VALUES REPRESENT TRANSIENT OF RAISED LINE AND SOLID LINE RESPECTIVELY.
4. EXCEPT EVENT 21A & 27, PRESSURE IS APPLICABLE FROM REACTOR NOZZLE TO N39A, 38B, 38C.
5. EVENT 21A & 27 PRESSURE IS APPLICABLE FROM REACTOR NOZZLE TO N39A, 24B, 24C.
6. ○ INDICATES EVENT NUMBER.

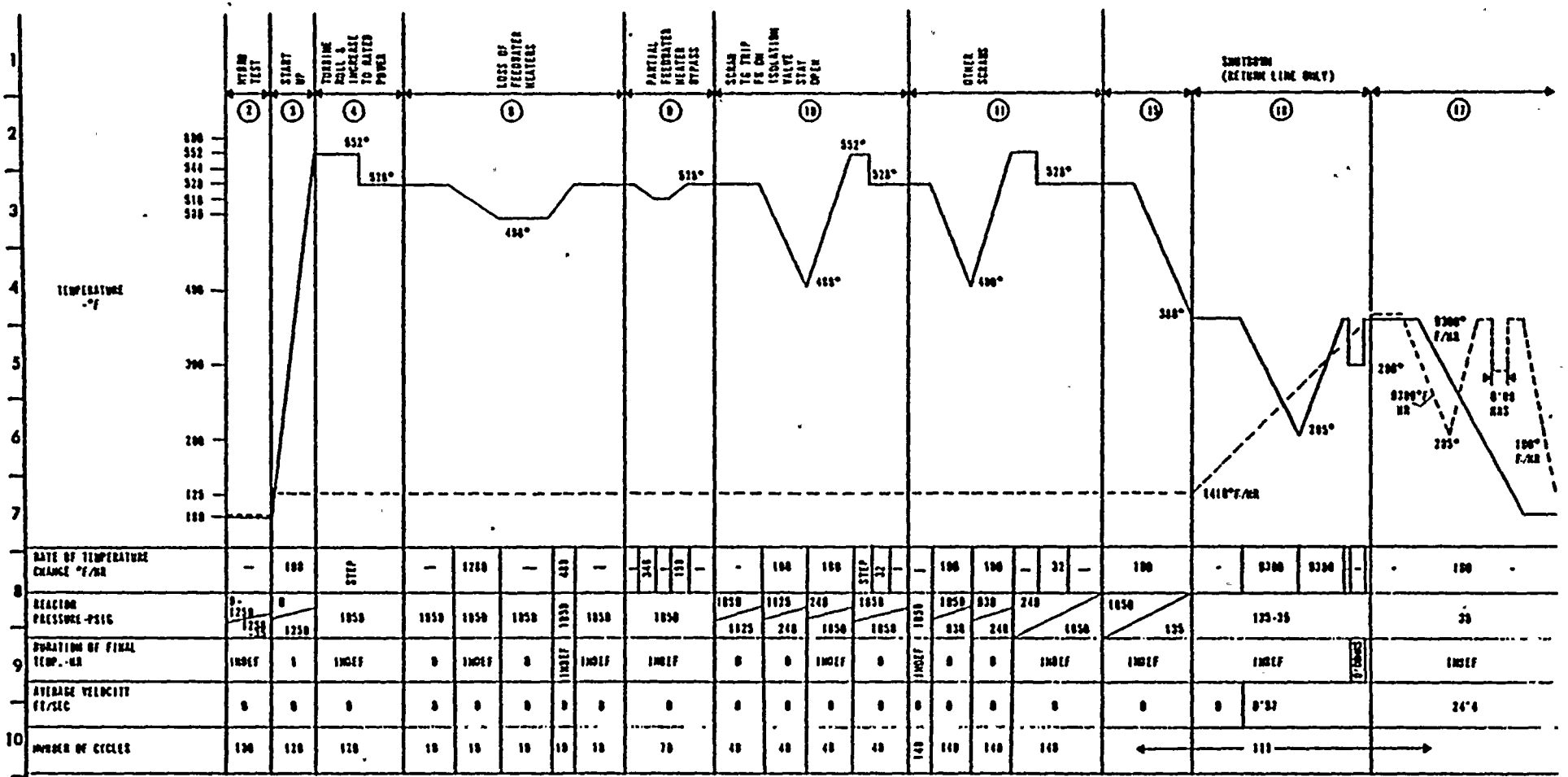
PAGE 2 OF 2

NORMAL & UPSET TRANSIENT OF RESIDUAL HEAT REMOVAL LPCI MODE

STONE & WEBSTER ENGINEERING CORPORATION

12177-SK-A94

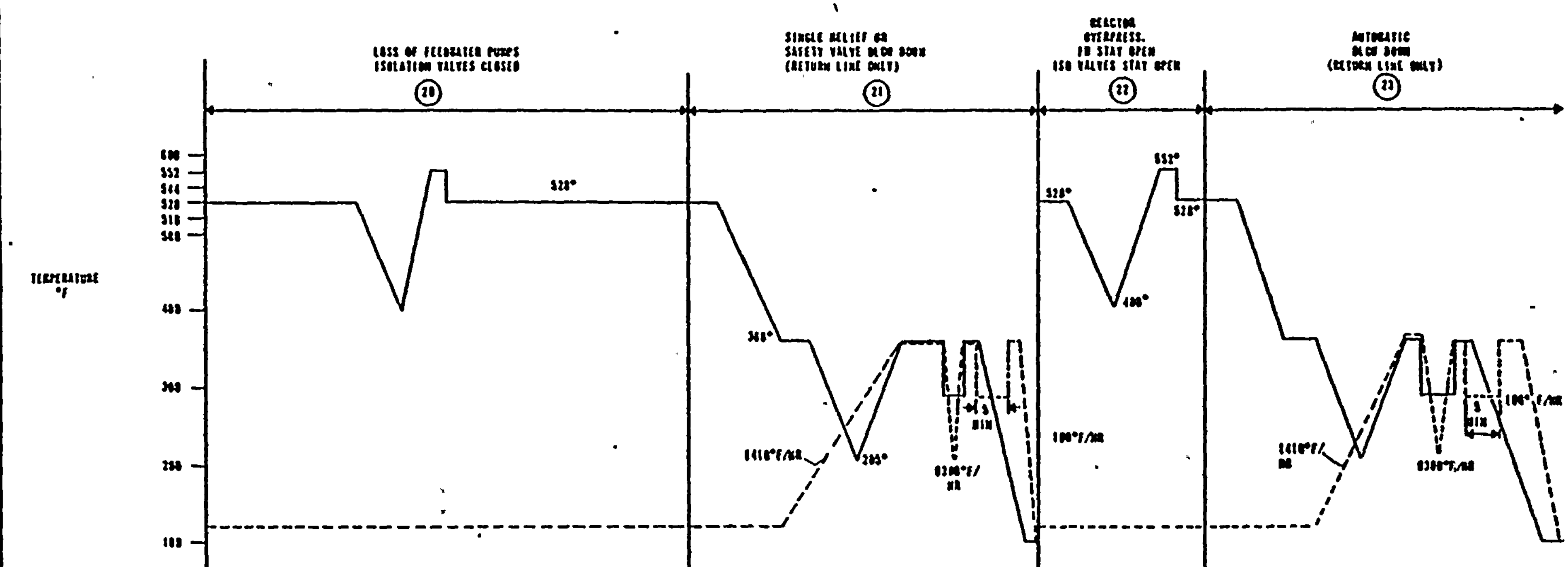
NO. 7



NOTES:
1. SOLID LINE REPRESENTS THE TRANSIENT OF HOR PIPING WHICH IS CONNECTED TO THE RECIRC. PIPING, 2RHS*MOV54A,2RHS*MOV54B AND 2RHS*MOV53.
2. DOTTED LINE REPRESENTS THE TRANSIENT FOR THE PIPING AT A DISTANCE OF 5 FT BELOW THE NOZZLE, 2RHS*AOV39A,2RHS*AOV39B,2RHS*MOV67A,2RHS*MOV67B, 2RHS*MOV48A AND 2RHS*MOV48B.

RESIDUAL HEAT REMOVAL
TRANSIENT-SUPPLY & RETURN
NINE MILE POINT - 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177-SK-A95

NO. 8



Event 20 (Loss of feedwater pumps, isolation valves closed)

RATE OF TEMP CHANGE-°F/HR	-	-	-	-	100	100 STEP	-	-	-	-	-
REACTOR PRESSURE-PSIG	1050/1100	1100/1125	1125/833	833/1100	1100/1125	1125/687	687/1100	1100/	1125/520	520/233	233/1050
DURATION OF FINAL TEMP-HR	INDEF	INDEF	INDEF	0	0	0	INDEF	INDEF	INDEF	INDEF	INDEF
AVERAGE VELOCITY FT/SEC	0	0	0	0	0	0	0	0	0	0	0
NUMBER OF CYCLES	10	10	10	10	10	10	10	10	10	10	10

Event 21 (Single relief or safety valve blow down, return line only)

RATE OF TEMP CHANGE-°F/HR	-	100	-	0300	0300	-	-	100
REACTOR PRESSURE-PSIG	1050	35	35	35	35	35	35	35
DURATION OF FINAL TEMP-HR	0	INDEF	0	0	0	INDEF	0.5 HR	INDEF
AVERAGE VELOCITY FT/SEC		0	0	0	0	0	0	24.4
NUMBER OF CYCLES	8	8	8	8	8	8	8	8

Event 22 (Reactor overpress., FW stay open, ISO valves stay open)

RATE OF TEMP CHANGE-°F/HR	0			STEP
REACTOR PRESSURE-PSIG	1050/1350	1350/240	240/1050	1050
DURATION OF FINAL TEMP-HR	0	0	0	INDEF
AVERAGE VELOCITY FT/SEC	0	0	0	0
NUMBER OF CYCLES	1	1	1	1

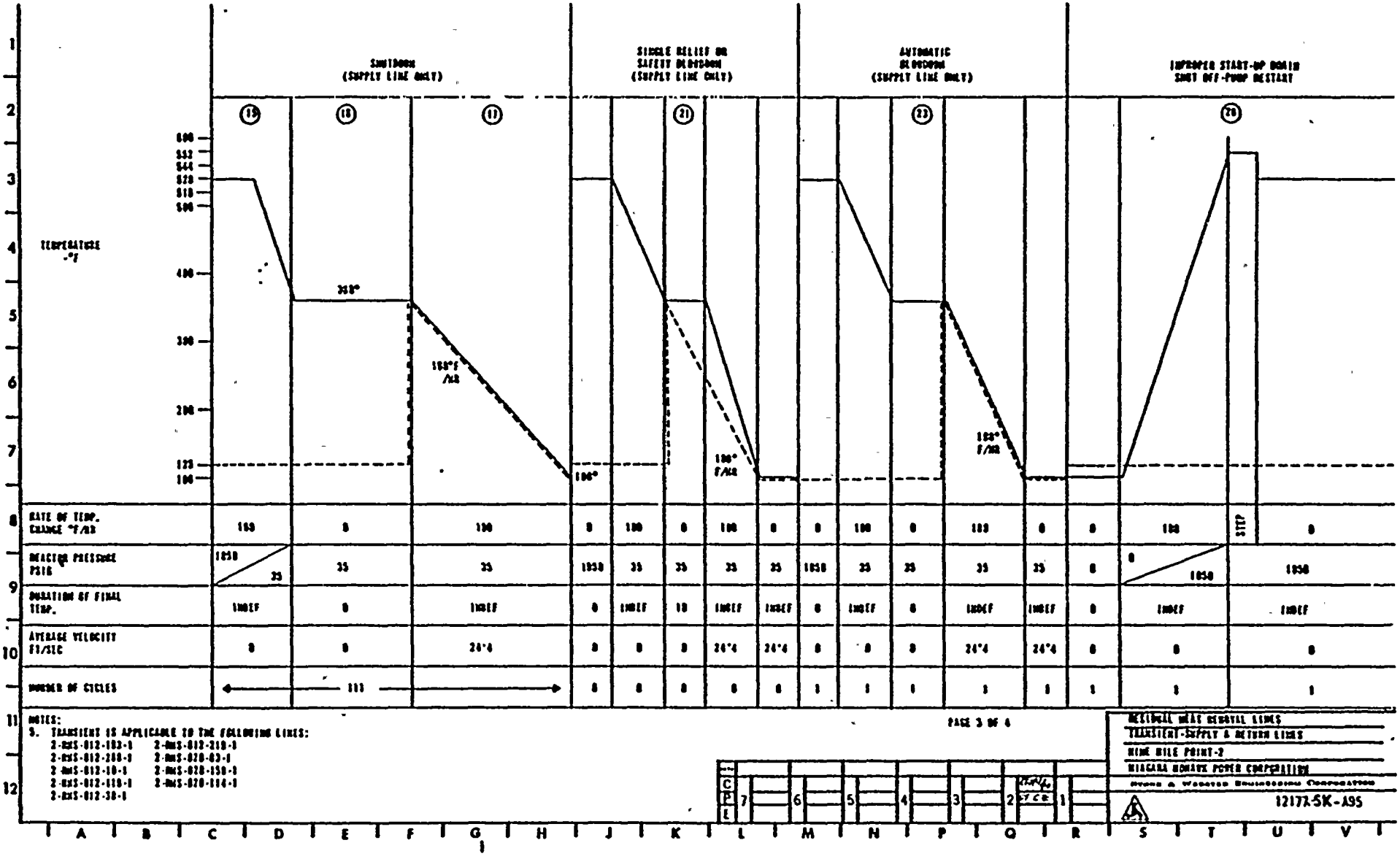
Event 23 (Automatic blow down, return line only)

RATE OF TEMP CHANGE-°F/HR		100	-	0300	0300	-	-	-	100	-
REACTOR PRESSURE-PSIG	1050/35	35	35	35	35	35	35	35	35	35
DURATION OF FINAL TEMP-HR	0	INDEF	0	0	0	INDEF	0.03	INDEF	0	INDEF
AVERAGE VELOCITY FT/SEC	0	0	0	0	0	0	0	0	24.4	24.4
NUMBER OF CYCLES	1	1	1	1	1	1	1	1	1	2

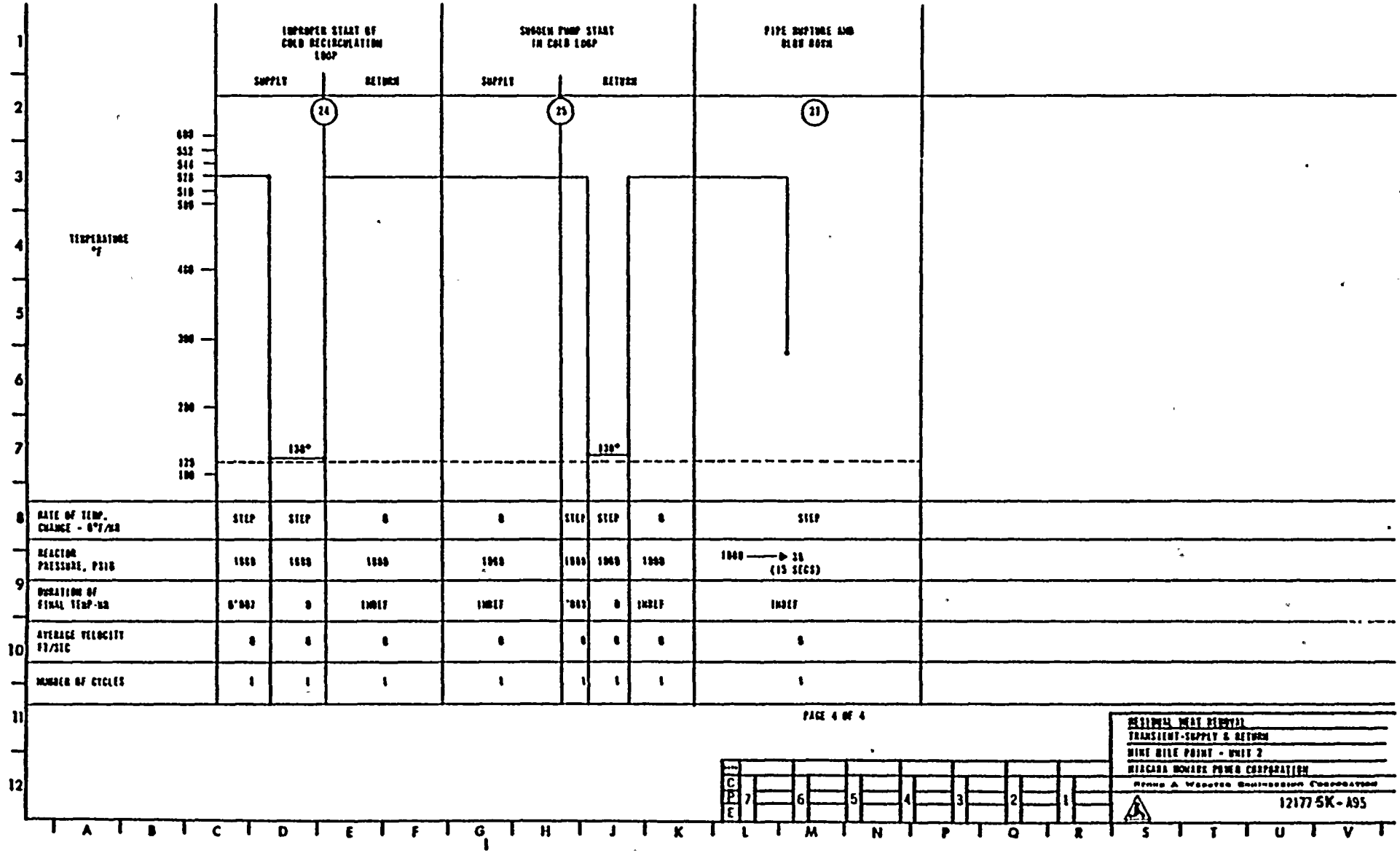
NOTES (CONT.):
4. RATE OF TEMP CHANGE, REACTOR PRESSURE, DURATION OF FINAL TEMP GIVEN ARE APPLICABLE TO THE SOLID LINE ONLY.
5. THERMAL TRANSIENT GIVEN ABOVE IS BASED ON GE SPECS 22A4246 REV 0. AND 22A2887, REV. 5.

RESIDUAL HEAT REMOVAL
TRANSIENT-SUPPLY & RETURN LINES
NINE MILE POINT-2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation
12177-SK-A95

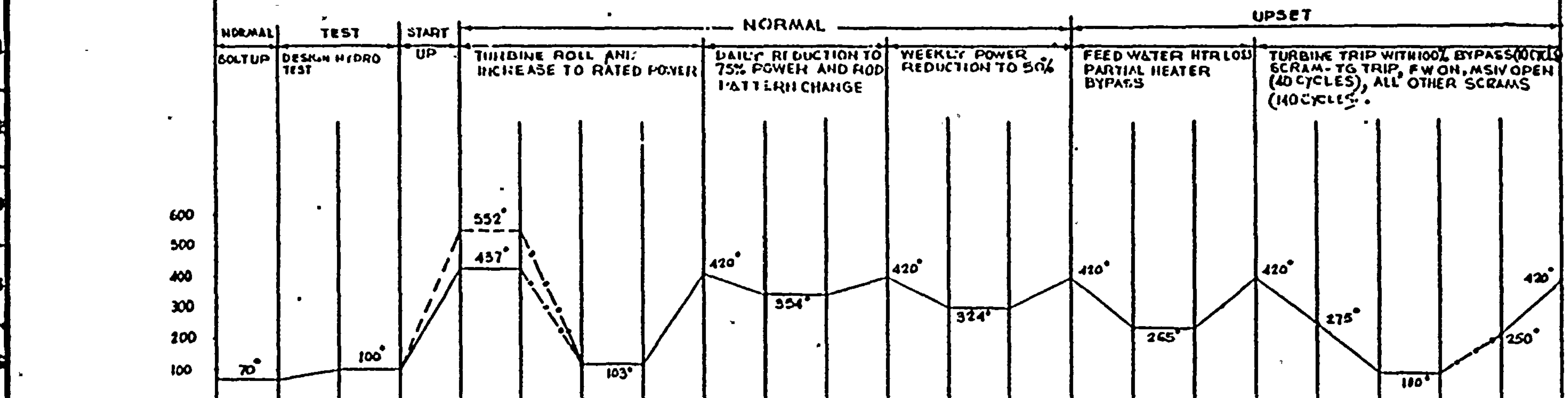
NO. 9


SHUTDOWN
(SUPPLY LINE ONLY)
SINGLE RELIEF OR
SAFETY BLOWDOWN
(SUPPLY LINE ONLY)
AUTOMATIC
BLOWDOWN
(SUPPLY LINE ONLY)
IMPROPER START-UP DOWN
SHUT OFF-PUMP RESTART
TEMPERATURE
°F
600
552
544
520
518
500
400
350°
300
200
125
100
165°F
/HR
100°
100°
F/HR
165°
F/HR
STEP
RATE OF TEMP. CHANGE °F/HR
REACTOR PRESSURE PSIG
1050
35
DURATION OF FINAL TEMP.
INDEF
AVERAGE VELOCITY FT/SEC
24'4
NUMBER OF CYCLES
111
NOTES:
1. TRANSIENT IS APPLICABLE TO THE FOLLOWING LINES:
2-RMS-812-183-1
2-RMS-812-188-1
2-RMS-812-10-1
2-RMS-812-118-1
2-RMS-812-38-1
2-RMS-828-83-1
2-RMS-828-158-1
2-RMS-828-114-1
PAGE 3 OF 4
NOZZLE HEAT REMOVAL LINES
TRANSIENT-SUPPLY & RETURN LINES
NINE MILE POINT-2
NIAGARA MOHAWK POWER CORPORATION
12177-5K-A95

NO. 10


IMPROPER START OF COLD RECIRCULATION LOOP
SUDDEN PUMP START IN COLD LOOP
PIPE RUPTURE AND BLOW DOWN
SUPPLY
RETURN
SUPPLY
RETURN
24
25
21
TEMPERATURE °F
600
532
514
528
518
500
400
300
200
138°
138°
125
100
RATE OF TEMP. CHANGE - 0°F/HR
STEP
STEP
0
0
STEP
STEP
0
STEP
REACTOR PRESSURE, PSIG
1000
1000
1000
1000
1000
1000
1000
1000 ——▶ 35 (15 SECS)
DURATION OF FINAL TEMP-HR
0.083
0
INDEF
INDEF
0.083
0
INDEF
INDEF
AVERAGE VELOCITY FT/SEC
0
0
0
0
0
0
0
0
NUMBER OF CYCLES
1
1
1
1
1
1
1
1
PAGE 4 OF 4
RESIDUAL HEAT REMOVAL
TRANSIENT-SUPPLY & RETURN
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation
12177-SK-A95
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
1
2
3
4
5
6
7
8
9
10
11
12

NO. 11



EVENT NO	1	2	2	3	4	4	4	4	5 & 7	5 & 7	5 & 7	6	6	6	9	9	9	8,10,11	8,10,11	8,10,11	8,10,11	8,10,11
DURATION OF TEMP	INDEF	—	INDEF	—	1800 SECS	—	3000 SECS	—	—	INDEF	—	—	INDEF	—	—	INDEF	—	—	—	INDEF	—	—
RATE OF TEMP CHANGE °F/HR	—	60	—	100	—	STEP	—	660	264	—	264	192	—	192	6200	—	3100	8700	700	—	STEP	340
EXPECTED NO OF CYCLES		130 →	→	120 →	→	→	→	→	10,400 →	→	→	2000 →	→	→	70 →	→	→	10+40+140 →	→	→	→	→
TOTAL FLOW % VWO (SEE NOTE 4)	0 →	→	→	→	→	0 / 15	15	15 / 100	100 / 75	75	75 / 100	100 / 50	50	50 / 100	→	→	→	→ 110	110 / 10	10 / 25 (10)	25	25 / 100
RPV PRESSURE - PSIG	ATM	ATM	1250	0 / 1000	→	→	→	→	→	→	→	→	→	→	→	→	→	1125	1125 / 240	→	/ 1000	1000
VELOCITY IN 12" LINE - FT/HOUR	0 →	→	→	0 / 1548	→	/ 5888	→	/ 67176	/ 50374	→	/ 67176	/ 32816	→	/ 67176	/ 60614	→	/ 67176	/ 68574	/ 7021	/ 15602	/ 16441	/ 67176
VELOCITY IN 18" LINE - FT/HOUR	0 →	→	→	0 / 1535	→	/ 5805	→	/ 66669	/ 47341	→	/ 66669	/ 32655	→	/ 66609	/ 60109	→	/ 66649	/ 67993	/ 6962	/ 15411	/ 16305	/ 66609
VELOCITY IN 24" LINE DOWNSTREAM OF MIXING TEE (CLASS 901) FT/Hr	0 →	→	→	0 / 1290	→	/ 8240	→	/ 57255	/ 41971	→	/ 57255	/ 27347	→	/ 57255	/ 51664	→	/ 57255	/ 57143	/ 5851	/ 13202	/ 13703	/ 57255
VELOCITY IN 24" LINE (CLASS 1511) DOWNSTREAM OF MIXING TEE FT/H	0 →	→	→	0 / 1607	→	/ 10264	→	/ 71312	/ 57??	→	/ 71312	/ 34067	→	/ 71312	/ 64350	→	/ 71312	/ 71176	/ 7280	/ 16125	/ 17068	/ 71312
VELOCITY IN 24" LINE (1511) UPSTREAM OF MIXING TEE	0 →	→	→	0 / 0	→	/ 8913	→	/ 69727	/ 50743	→	/ 69727	/ 32580	→	/ 69727	/ 61990	→	/ 69727	/ 67754	/ 5938	/ 13195	/ 13907	/ 69727

1. Flow is increased to 25% after an indefinite Hold time at 100°F. After an additional Hold for 30 more minutes at 100°F and 25% flow, the FW heating begins and the temperature increased to 266°F in step.

2. — — — — Indicates Transients applicable to feed water nozzle and in piping between nozzle and to a point 5' below the nozzle.

3. —•—•— Indicates step change in temperature

4. Unless otherwise noted, the flow is assumed to be linear with temperature trip.

5. These transients are
10 Interim Start of cold Recirc Loop
25 Isolation Loop Start in Cold Recirc Loop

This Histogram is developed based on the numerical results of calculation no 12177-A10-20-49

Q.A. CAT I
NUCLEAR SAFETY RELATED

FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION

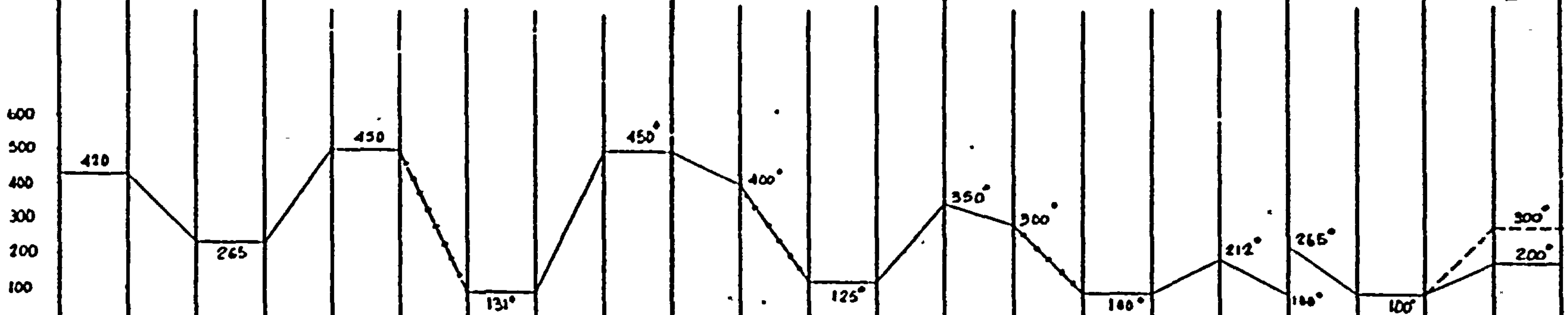
STONE & WEBSTER ENGINEERING CORPORATION
12177
SK-A98
1 OF 4

7/18/78

NO. 12

NORMAL

RATED POWER	REDUCTION TO 0% POWER	HOT STANDBY - ABNORMAL	SHUT DOWN PRIOR TO VESSEL FLOODING	VESSEL FLOODING	HOT STANDBY NORMAL	SHUTDOWN PRIOR TO VESSEL FLOODING NORMAL



	C	D	D	F	F	G	G	H	H	K	K	L	M	N	P	Q	R	R	S	T	U	V
EVENT NO	12	13 →	→	14A →	→	→	→	→	→	15A →	→	→	→	16A →	→	→	→	→	14B →	→	15B →	→
DURATION OF TEMP	INDEF	—	INDEF	—	30MIN	—	30MIN	—	INDEF	—	—	30 MIN	—	—	—	10MIN	—	—	—	INDEF	—	30MIN
RATE OF TEMP CHANGE °F/HR	—	310	—	5500	—	STEP	—	10,500	—	300	STEP	—	7500	100	STEP	—	3360	100	1980	—	3000	—
EXPECTED NO OF CYCLES	—	111	111	15 →	→	→	→	→	→	→	→	→	→	→	→	→	→	→	96 →	→	→	→
TOTAL FLOW % OF VWO (SEE NOTE 4)	100	100 / 25	25	25 / 0	→	/ 25	→	/ 0	→	→	/ 25	→	/ 0	→	/ 25	→	/ 0	0	25 →	→	/ 0	→
RPV PRESSURE - PSIG	1000	→	→	→	→	→	→	→	→	1000 / 235		→	/ 120	→	→	120 / 0	→	→	1000	1000 / 120	→	→
VELOCITY IN 12" LINE - FT/HOUR	67176	/ 15580		/ 156.4		/ 15119		/ 1564		/ 1498	/ 15471		/ 1447	/ 1403	/ 15603		/ 1344	/ 1301	16580 / 15603		/ 1337	
VELOCITY IN 18" LINE - FT/HOUR	66609	/ 16410		/ 1551		/ 16186		/ 1554		/ 1486	/ 15538		/ 1435	/ 1391	/ 15471		/ 1333	/ 1290	16440 / 15471		/ 1326	
VELOCITY IN 24" LINE DOWNSTREAM OF MIXING TEE (CLASS 301) FT/H	57253	/ 13211		/ 1304		/ 13099		/ 1304		/ 1241	/ 13034		/ 1266	/ 116.9	/ 13103		/ 1120	/ 1084	13817 / 13003		/ 1115	
VELOCITY IN 24" LINE (CLASS 1U) DOWNSTREAM OF MIXING TEE FT/H	71312	/ 17210		/ 1623		/ 16.34		/ 1624		/ 1556	/ 16266		/ 1583	/ 1451	/ 16196		/ 1396	/ 1350	17210 / 16196		/ 1389	
VELOCITY IN 24" LINE (SH) UPSTREAM OF MIXING TEE	69727	/ 15115		/ 0		/ 11.24		/ 0		/ 0	/ 14910		/ 0	/ 0	/ 14844		/ 0	/ 0	15775 / 14844		/ 0	

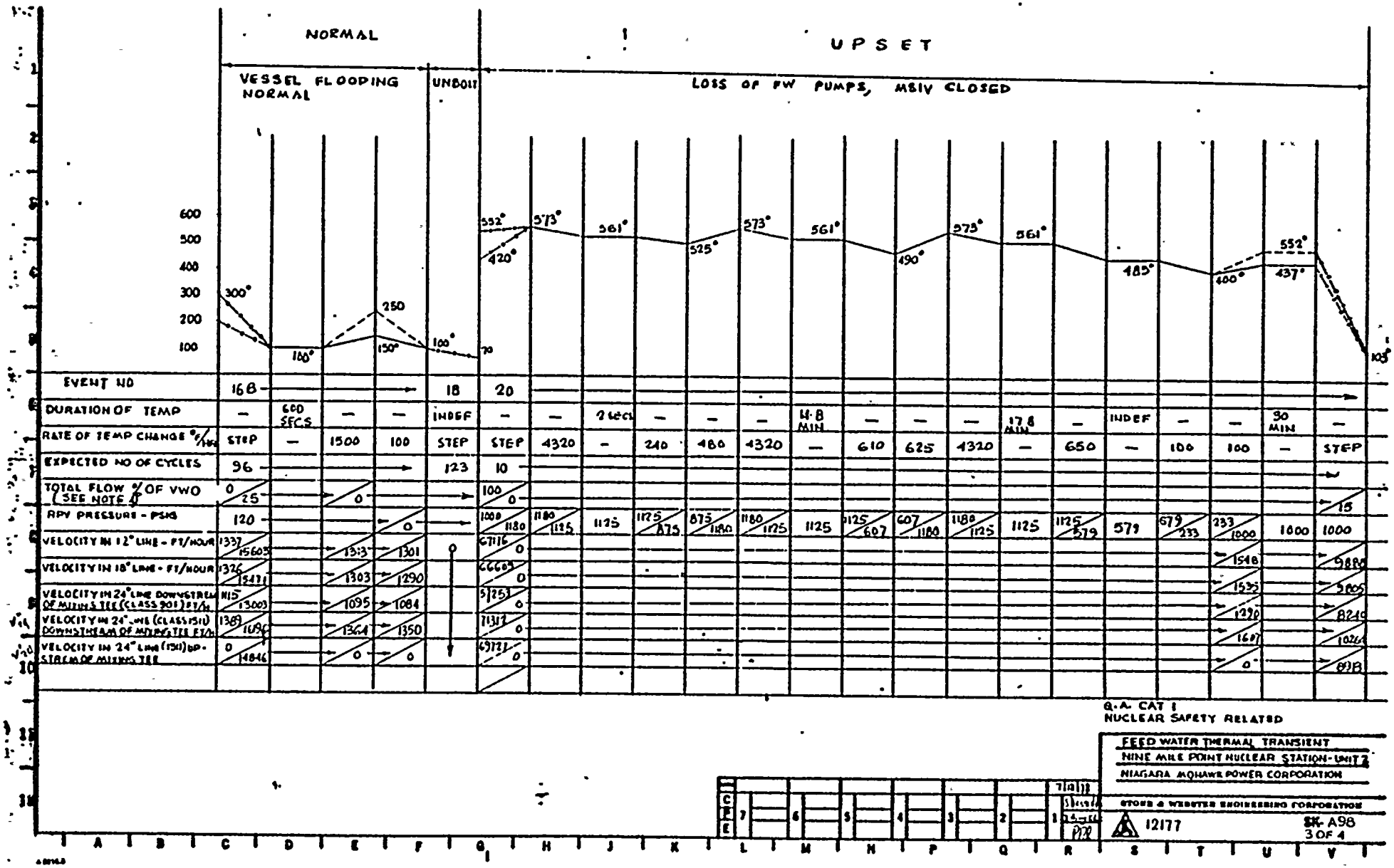
Q-A-CAT I
NUCLEAR SAFETY RELATED

FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION-UNIT 2
NIAGARA MOHAWK POWER CORPORATION

STONE & WEBSTER ENGINEERING CORPORATION

12177 SK-A98
2 OF 4

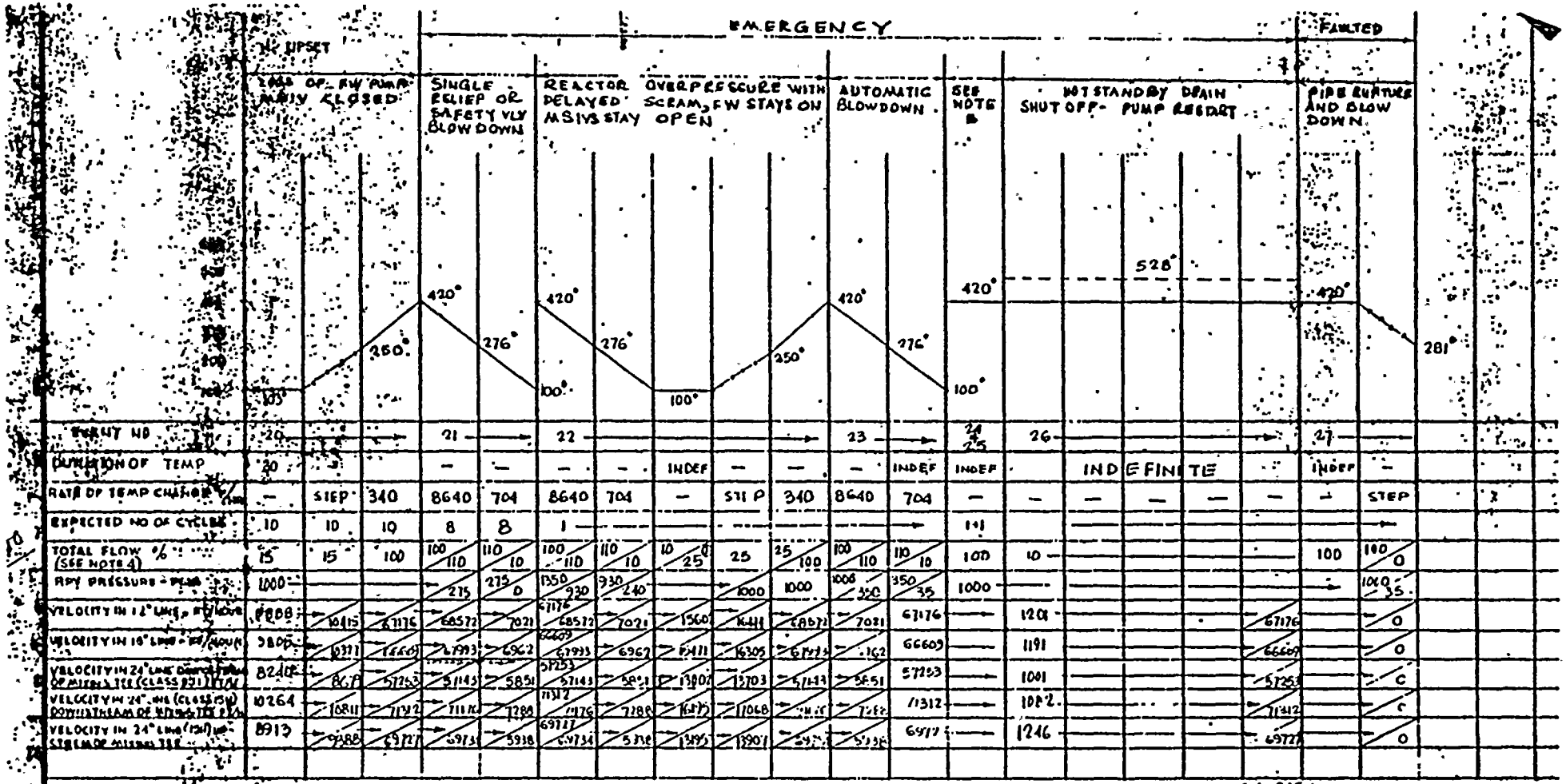
No. 13



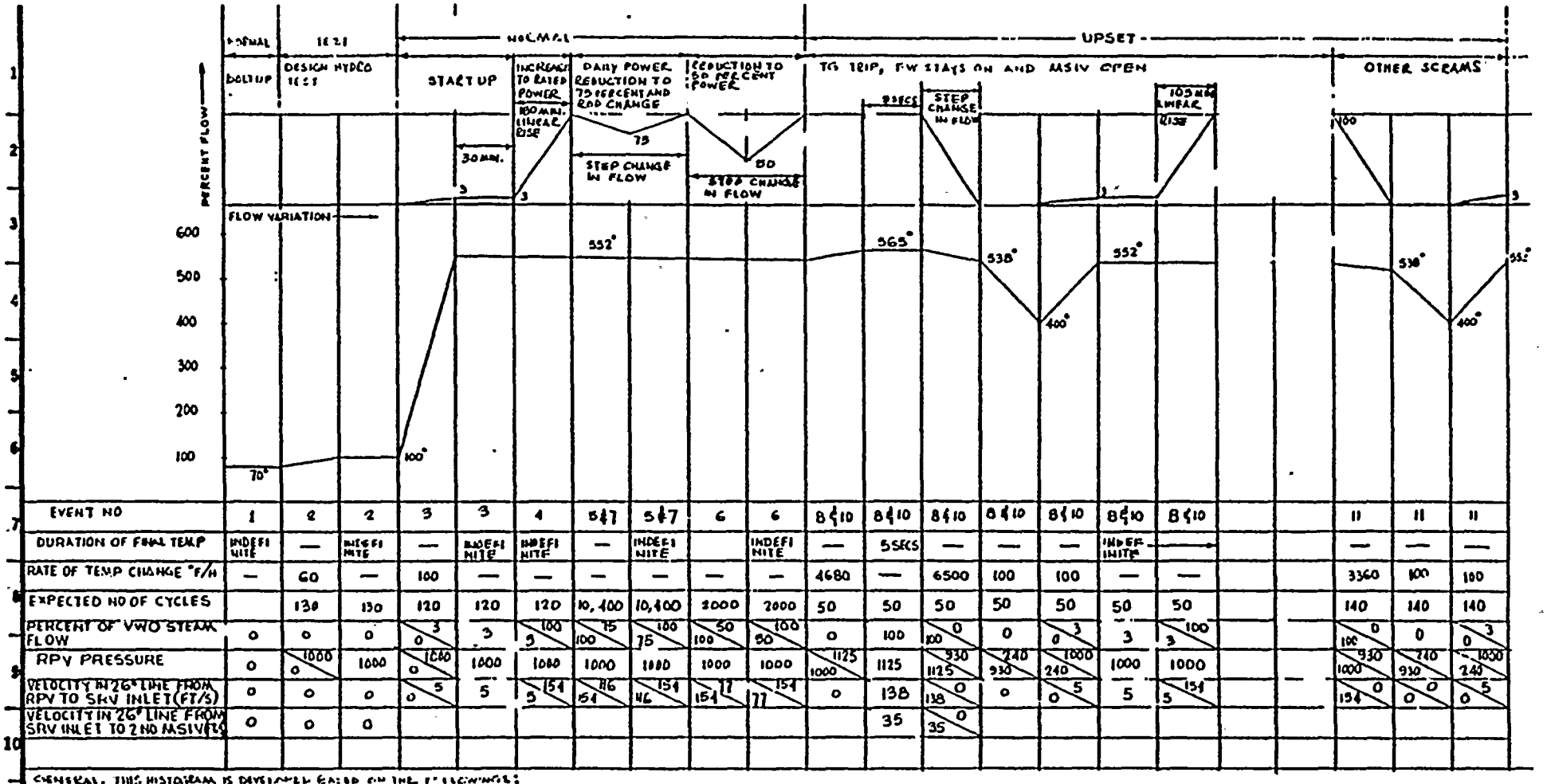
Q.A. CAT I
NUCLEAR SAFETY RELATED

FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177
SK-A98
3 OF 4

NO. 14

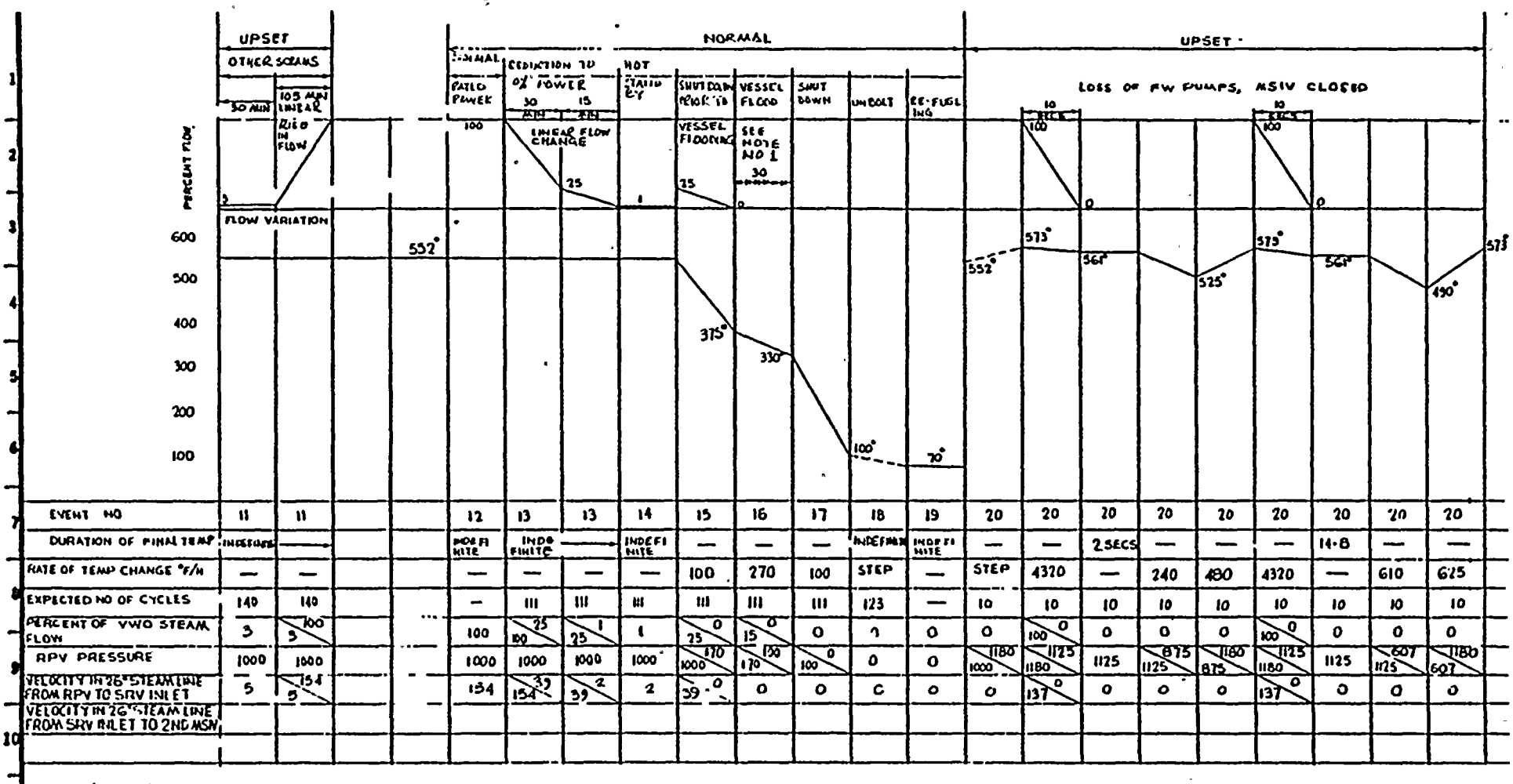

UPSET
EMERGENCY
FAULTED
LOSS OF FW PUMP AUX CLOSED
SINGLE RELIEF OR SAFETY VLV BLOW DOWN
REACTOR DELAYED MSIVS STAY OPEN
OVERPRESSURE WITH SCRAM, FW STAYS ON
AUTOMATIC BLOWDOWN
SEE NOTE 5
HOT STANDBY DRAIN SHUT OFF - PUMP RESTART
PIPE RUPTURE AND BLOW DOWN
420°
528°
276°
260°
100°
281°
EVENT NO
DURATION OF TEMP
RATE OF TEMP CHANGE °F/HR
EXPECTED NO OF CYCLES
TOTAL FLOW % (SEE NOTE 4)
RPV PRESSURE - PSIG
VELOCITY IN 12" LINE - FT/HOUR
VELOCITY IN 10" LINE - FT/HOUR
VELOCITY IN 24" LINE DOWNSTREAM OF MIXING TEE (CLASS 1)
VELOCITY IN 24" LINE (CLASS 1) DOWNSTREAM OF MIXING TEE
VELOCITY IN 24" LINE (CLASS 1) UPSTREAM OF MIXING TEE
INDEFINITE
Q.A. CAT I
NUCLEAR SAFETY RELATED
FEED WATER THERMAL TRANSIENT
NINE MILE POINT NUCLEAR STATION - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
12177
SK-A98
4 OF 4

NO. 15



EVENT NO	1	2	2	3	3	4	5&7	5&7	6	6	8&10	8&10	8&10	8&10	8&10	8&10	8&10	11	11	11
DURATION OF FINAL TEMP	INDEFINITE	—	INDEFINITE	—	INDEFINITE	INDEFINITE	—	INDEFINITE		INDEFINITE	—	5 SECS	—	—	—	INDEFINITE	→	—	—	—
RATE OF TEMP CHANGE °F/H	—	60	—	100	—	—	—	—	—	—	4680	—	6500	100	100	—	—	3360	100	100
EXPECTED NO OF CYCLES		130	130	120	120	120	10,400	10,400	2000	2000	50	50	50	50	50	50	50	140	140	140
PERCENT OF VWO STEAM FLOW	0	0	0	3 / 0	3	100 / 3	15 / 100	100 / 75	50 / 100	100 / 50	0	100	0 / 100	0	3 / 0	3	100 / 3	0 / 100	0	3 / 0
RPV PRESSURE	0	1000 / 0	1000	1000 / 0	1000	1080	1000	1080	1000	1000	1125 / 1000	1125	930 / 1125	240 / 930	1000 / 240	1000	1000	930 / 1000	240 / 930	1000 / 240
VELOCITY IN 26" LINE FROM RPV TO SRV INLET (FT/S)	0	0	0	0 / 5	5	154 / 5	116 / 154	154 / 116	77 / 154	154 / 77	0	138	0 / 138	0	5 / 0	5	154 / 5	0 / 154	0 / 0	5 / 0
VELOCITY IN 26" LINE FROM SRV INLET TO 2ND MSIV (FT/S)	0	0	0									35	0 / 35							

NO. 16



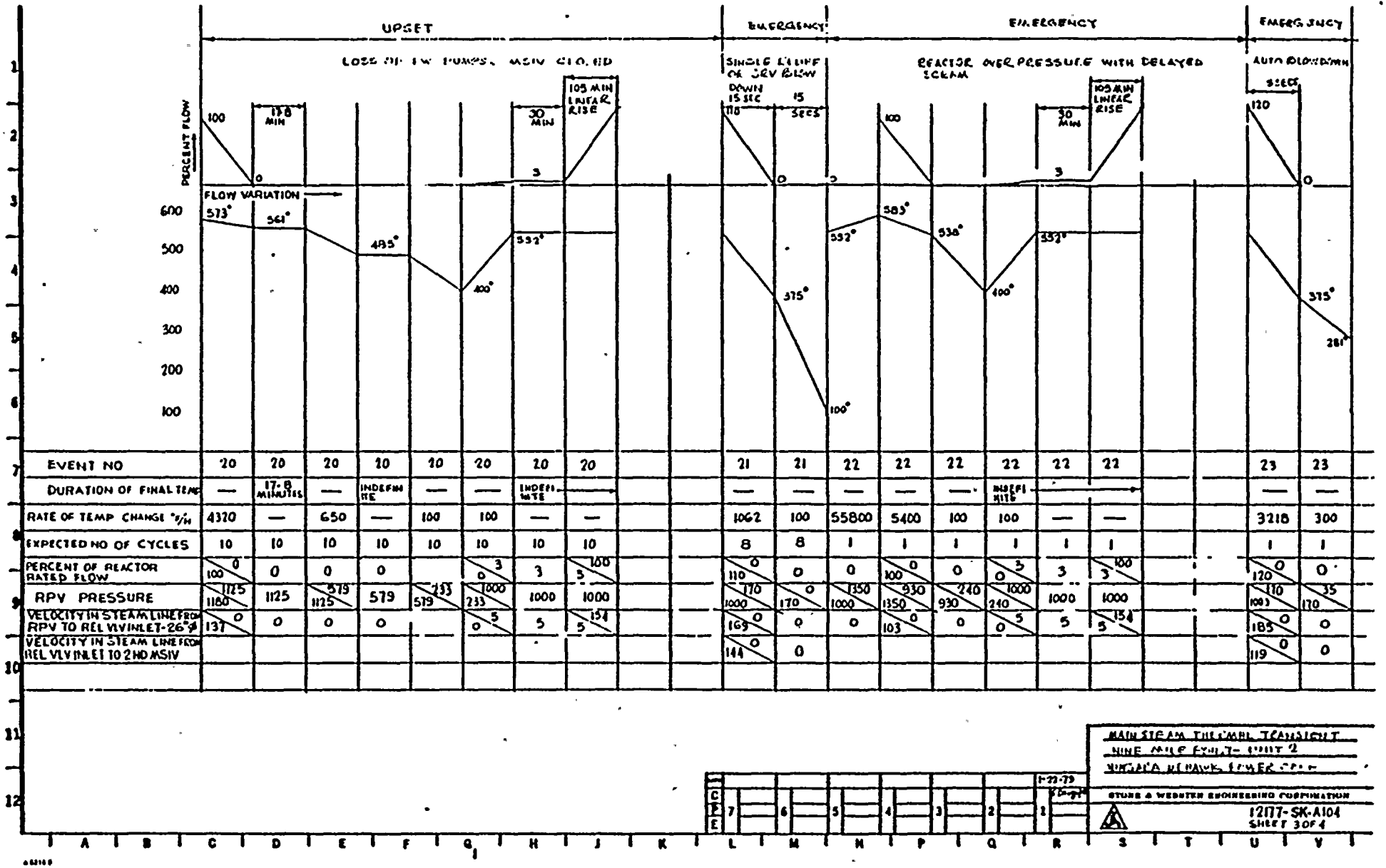
NOTE 1 DURING THIS PERIOD, WATER FLOWS INTO THE MAIN STEAM PIPE

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.

STONE & WEBSTER ENGINEERING CORPORATION

12117-SK-A104
SHEET 2 OF 4

NO. 17


UPSET
EMERGENCY
EMERGENCY
EMERGENCY
LOSS OF FW PUMPS, MSIV CLOSED
SINGLE LINE OF SRV BLOW DOWN 15 SEC
REACTOR OVERPRESSURE WITH DELAYED SCRAM
AUTO BLOWDOWN
PERCENT FLOW
FLOW VARIATION
17.8 MIN
30 MIN
105 MIN LINEAR RISE
15 SECS
EVENT NO
DURATION OF FINAL TEMP
RATE OF TEMP CHANGE °F/H
EXPECTED NO OF CYCLES
PERCENT OF REACTOR RATED FLOW
RPV PRESSURE
VELOCITY IN STEAM LINE FROM RPV TO REL VLV INLET-26"ϕ
VELOCITY IN STEAM LINE FROM REL VLV INLET TO 2ND MSIV
MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.
STONE & WEBSTER ENGINEERING CORPORATION
12177-SK-A104
SHEET 3 OF 4

NO. 18

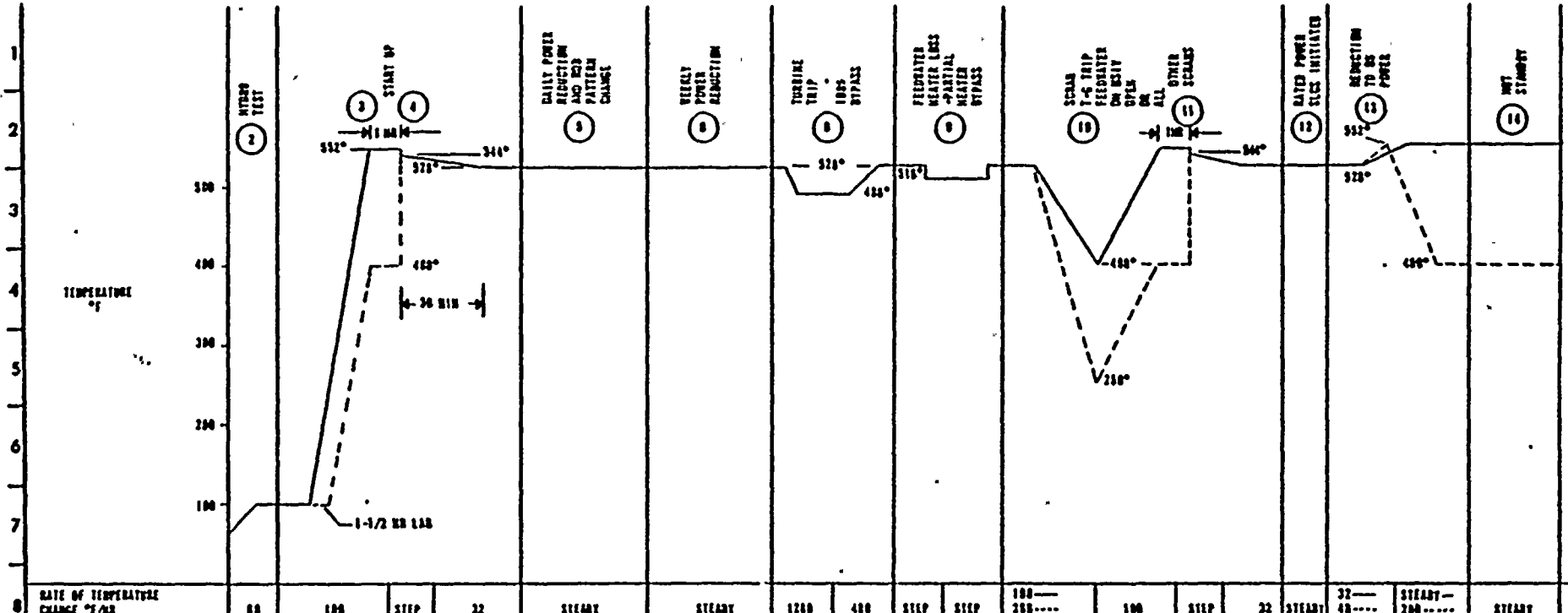
	EMERGENCY	EMERGENCY	EMERGENCY	FAULTED		UPSET			
	INSTANT START OF COLD RECIRC LOOP	SUDDEN PUMP START IN COLD REC LOOP	HOT STANDBY DOWN SHUT OFF PUMP RESTART	PIPE RUPTURE AND BLOW DOWN		PARTIAL FW HTR BYPASS			
600 / 500 / 400 / 300 / 200 / 100		552°		281°		552°			
EVENT NO	24	25	26	27		9			
DURATION OF FINAL TEMP	INDEFINITE	INDEFINITE	INDEFINITE			INDEFINITE			
RATE OF TEMP CHANGE °F/H	—	—	—	STEP		—			
EXPECTED NO CYCLES	1	1	1	1		10			
PERCENT OF REACTOR RATED FLOW	100	100	3	100 \ 0		100			
RPV PRESSURE	1000	1000	1000	100 \ 35		1000			
VELOCITY IN 26" LINE FROM RPV TO SRV INLET	154	154	5	154 \ 0		154			
VELOCITY IN 26" LINE FROM SRV INLET TO 2ND MSIV									

MAIN STEAM THERMAL TRANSIENT
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORP.

STONE & WEBSTER ENGINEERING CORPORATION

12177SK-A104
SHEET 4 OF 4

NO. 19



RATE OF TEMPERATURE CHANGE °F/HR	80	100	STEP	32	STEADY	STEADY	1200	400	STEP	STEP	100 — 200 ----	100	STEP	32	STEADY	32 — 40 ----	STEADY — 200 -----	STEADY
REACTOR PRESSURE-PSIG	0 / 1250	0 / 1050	1050	1050	1050	1050	1050	1050	1050	1050	NOTE 2	240 / 1050	1050	1050	1050	1050	1050	1050
DURATION TO FINAL TEMPERATURE-MIN	30	265.2	0	30	INDEF.	INDEF.	1.5	4	0	0	70.0 — 83.0 ----	60	0	30	INDEF.	45 — 30 ----	INDEF. — 45.0 -----	INDEF.
FLOW RATE #/HR	0	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	0	170,000	170,000	170,000
NUMBER OF CYCLES	130	120	120	120	10,400	2000	10	10	10	10	40 (10) / (1) 140	40 (10) / (1) 140	40 (10) (1) 140	40 (10) / (1) 140	10	111	111	111

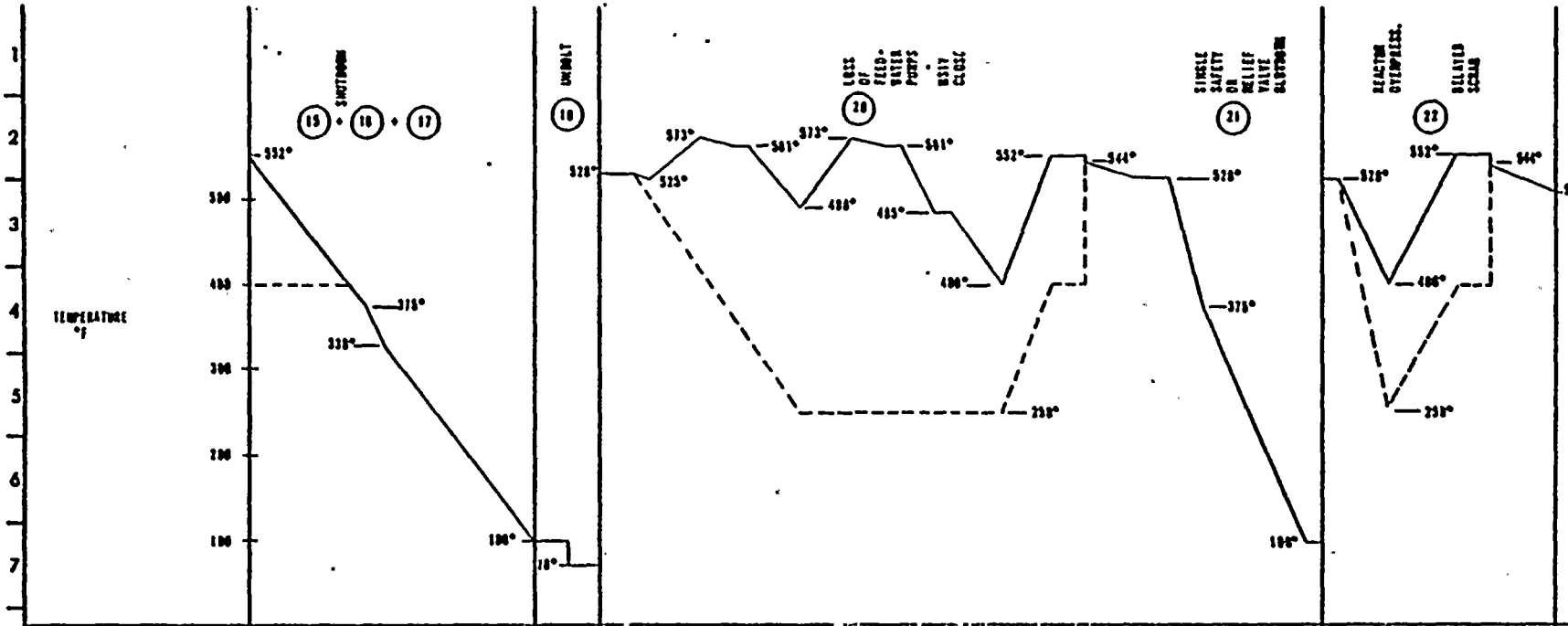
NOTES:
(1.) DASHED LINE REPRESENTS BOTTOM DRAIN LINE. SOLID LINE REPRESENTS RECIRC. SUCTION LINES AND COMMON PIPING AFTER CONNECTING WITH BOTTOM DRAIN. WHERE SOLID LINE ONLY APPEARS, IT REPRESENTS BOTH BOTTOM DRAIN & RECIRC. SUCTION LINES.
(2.) REACTOR PRESSURE INCREASES INITIALLY TO 1125 IN EVENT 10 WITH NO INCREASE IN TEMP. IN THIS SYSTEM AS PRESSURE DECREASES TO 240, TEMP. DECREASES AS SHOWN. EVENT 11 IS SIMILAR WITH NO INITIAL INCREASE IN PRESS. REACTOR PRESSURE IS INITIALLY AT 1050 IN BOTH CASES.

C	7	6	5	4	3	2	1
P							
E							

1-25-76 BEC

REACTOR WATER CLEAN-UP
TRANSIENT-SUCTION LINE
NINE MILE POINT - 2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
SK-

NO. 20



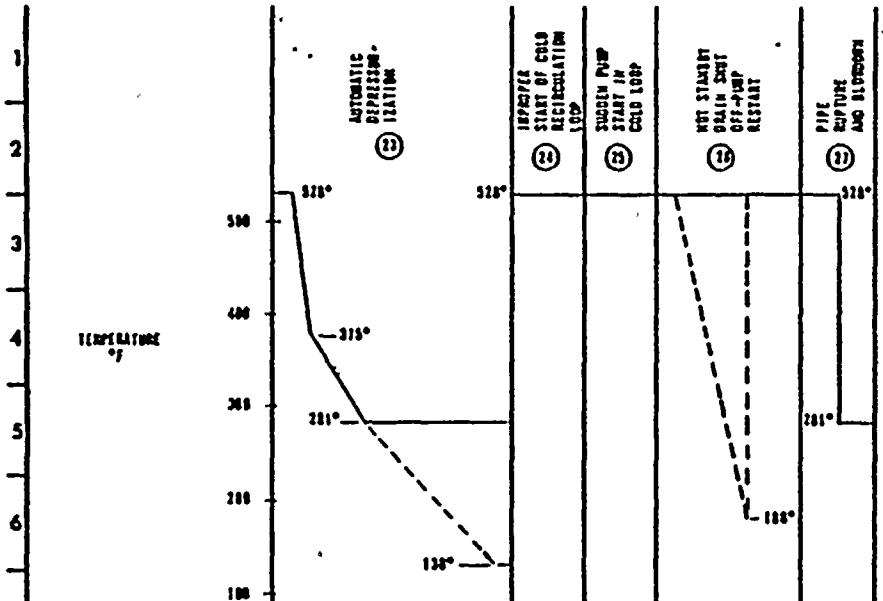
RATE OF TEMPERATURE CHANGE °F/HR	100 STEADY	270	188	STEP	28 200	488	4328	819	825 STEADY	4328	650	100	185	STEP	22	818	100	100 200	100	STEP	32°
REACTOR PRESSURE PSIG	1050 / 170	170 / 90	90 / 0	0	1050	1050 1100	1100 1025	1120 800	800 1100	1100 1125	1125 570	570 233	233 1050	1050	1050	1050 / 170	170 / 0	NOTE 2	240 / 1050	1050	1050
DURATION TO FINAL TEMPERATURE-MINUTES	100.2	10	138	0	0 83.4	0	.166	7	0 SHUT.	.110	7	51	90	0	20	10	165	78.0 83.4	90	0	20
FLOW RATE #/HR	170,000	170,000	170,000	340,000	340,000 ▶0	0	0	0	0	0	0	0	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000
NUMBER OF CYCLES	111	111	111	123	10	10	10	10	10	10	10	10	10	10	10	0	0	1	1	1	1

NOTES:
1. DASHED LINE REPRESENTS BOTTOM DRAIN LINE. SOLID LINE REPRESENTS RECIRC SUCTION LINES AND COMMON PIPING AFTER CONNECTING WITH BOTTOM DRAIN.
2. REACTOR PRESSURE INCREASES INITIALLY TO 1050 WITH NO INCREASE IN TEMP. IN THIS SYSTEM, AS PRESSURE DECREASES TO 240, TEMP. DECREASES AS SHOWN. REACTOR PRESSURE IS INITIALLY AT 1050.

REACTOR WATER CLEAN-UP
TRANSIENT-SUCTION LINE
NINE MILE POINT - 2
NIAGARA MOHAWK POWER CORP.
Stone & Webster Engineering Corporation
SK-

A 90000

NO. 21

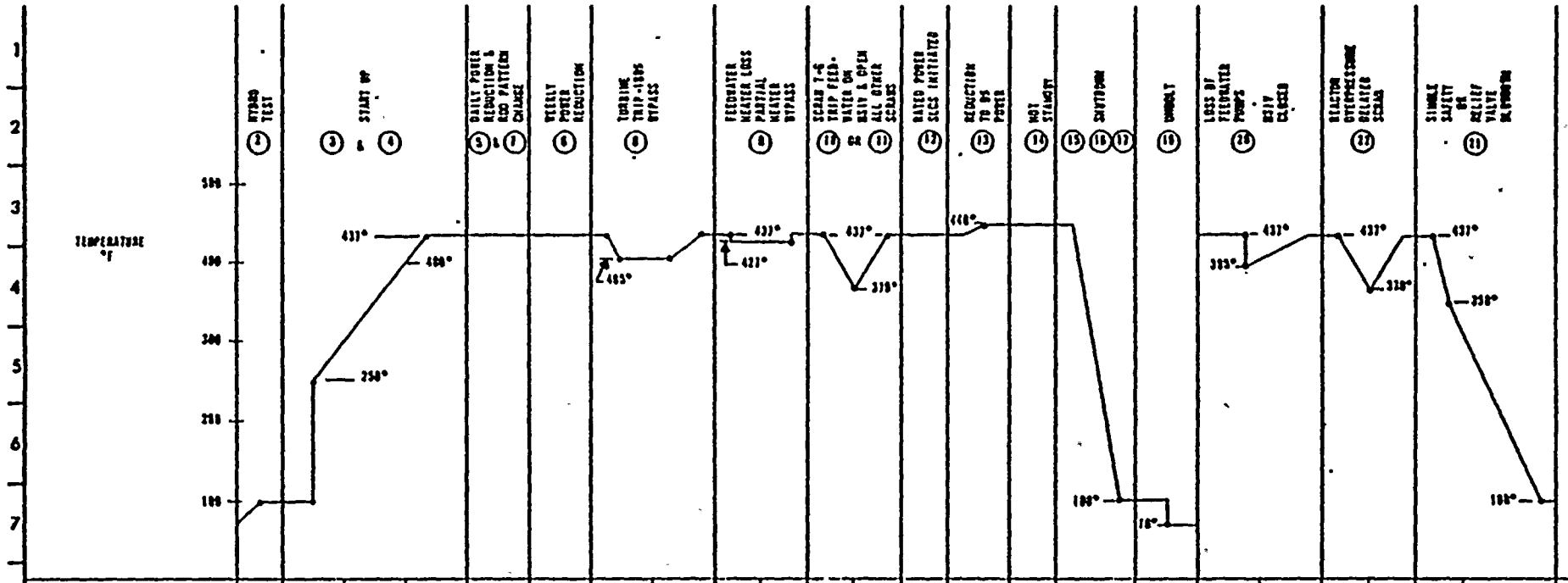


RATE OF TEMPERATURE CHANGE °F/HR	2100	300	STEADY-200----	STEADY	STEADY	STEADY 200---	STEADY STEP--	STEP
REACTOR PRESSURE PSIG	1050 / 170	170 / 35	35	1050	1050	1050	1050	1050 / 35
DURATION TO FINAL TEMPERATURE-MINUTES	3.3	10.0	43.3	INDEF.	INDEF.	144.4	0	0
FLOW RATE #/HR	340,000	340,000	340,000	110,000	110,000	340,000	340,000	340,000 → 0
NUMBER OF CYCLES	1	1	1	1	1	1	1	1

	REACTOR WATER CLEAN-UP
	TRANSIENT-SYSTEM LINE
	NINE MILE POINT - 2
	NIAGARA MOHAWK POWER CORP.
	Stone & Webster Engineering Corporation
9-29-75 GER	SK-

A 90400

NO. 22

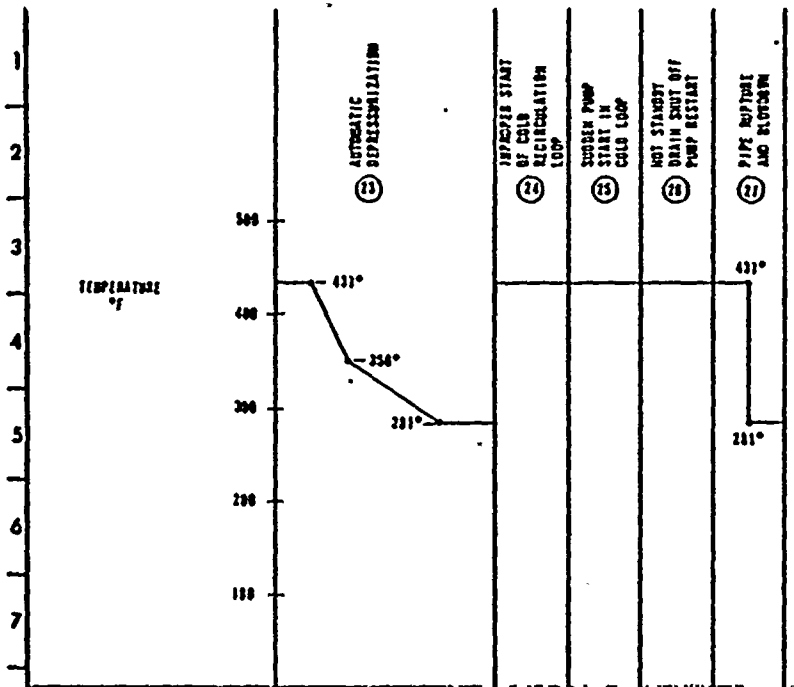


RATE OF TEMPERATURE CHANGE °F/HR	60	STEP	100	100	STEADY	STEADY	1200	400	STEP	STEP	100	100	STEADY	15	STEP	100	STEP	STEP	100	100	100	320	100
REACTOR PRESSURE PSIG	0/1250/0	0/15	15/2085	2085/1050	1050	1050	1050	1050	1050	1050	NOTE 1	249/1050	1050	1050	1050	1050/0	0	NOTE 2	233-1050	NOTE 3	249-1050	1050-133	135-0
DURATION TO FINAL TEMPERATURE-MIN	30	0	50	22	INDEF	INDEF	1-1/2	4	0	0	40	40	INDEF	45	INDEF	210	0	0	25	40	40	10	150
FLOW RATE #/HR	0	0	0/240,000	240,000	240,000	240,000	240,000	240,000	240,000	240,000	240,000	240,000	0	120,000	120,000	120,000	120,000	0-240,000	240,000	240,000	240,000	240,000	240,000
NUMBER OF CYCLES	120	120	120	120	10,400	2,000	10	10	20	20	40/140	40/140	10	111	111	111	123	10	10	1	1	1	1

NOTES:
1. REACTOR PRESSURE INCREASES INITIALLY FROM 1050 TO 1125 IN EVENT 10 WITH NO INCREASE IN TEMPERATURE IN THIS SYSTEM. AS PRESSURE DECREASES TO 249, TEMPERATURE DECREASES AS SHOWN. EVENT 11 IS SIMILAR WITH NO INITIAL INCREASE IN PRESSURE.
2. REACTOR PRESSURE CYCLES TO A HIGH OF 1150 FOR THREE TIMES AND FINALLY DECREASES TO A LOW OF 233. REACTOR PRESSURE IS INDEPENDENT OF THIS SYSTEM TEMP.
3. THIS EVENT IS SIMILAR TO NOTE 1 EXCEPT INITIAL PRESSURE INCREASE IS TO 1350.

REACTOR WATER CLEAN-UP
TRANSIENT-DISCHARGE LINE
NINE MILE POINT-2
NIAGARA MOHAWK POWER CORPORATION
Gilbert & Western Engineering Corporation
SK-

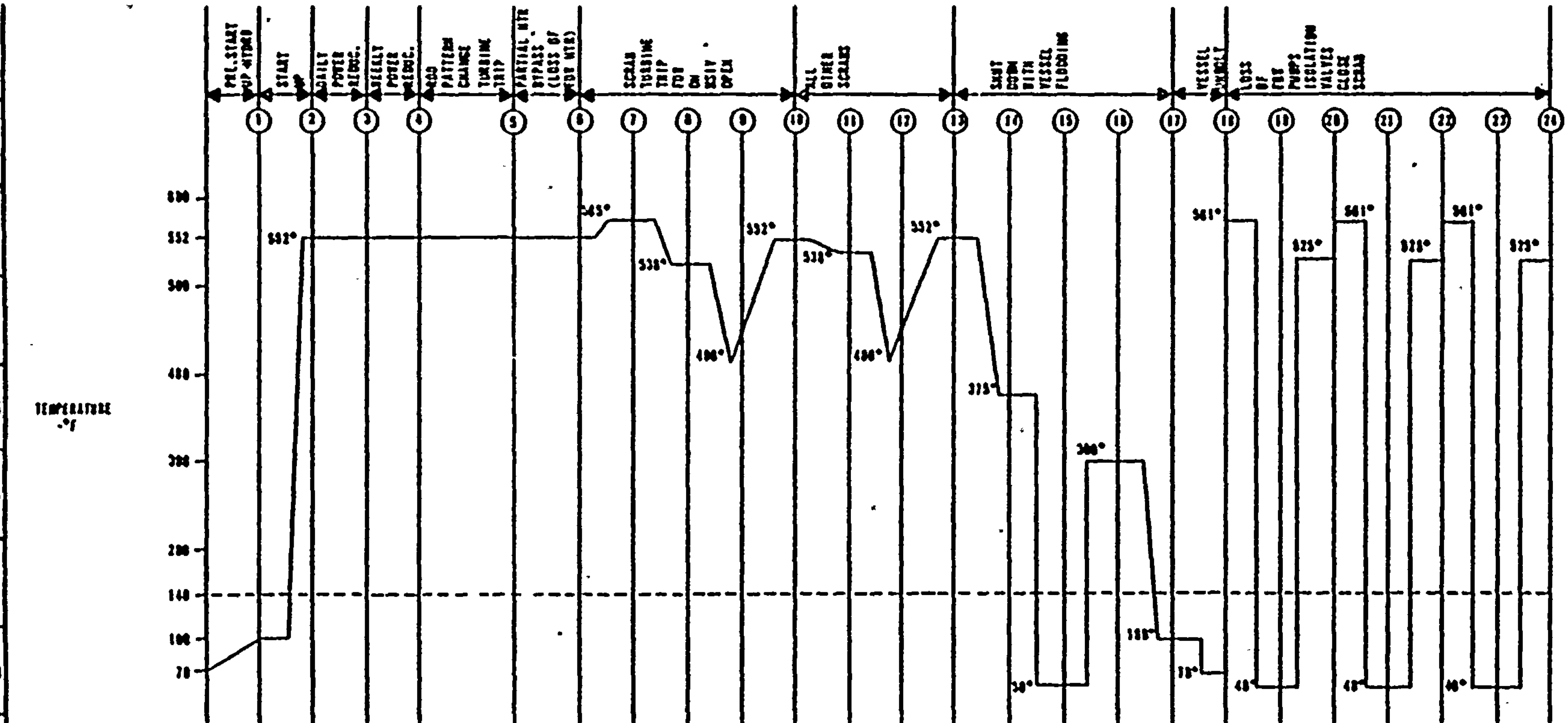
NO. 23



RATE OF TEMPERATURE CHANGE °F/HR	1562	350	STEADY	STEADY	STEADY	STEEP
REACTOR PRESSURE PSIG	1050 / 170	170 / 35	1050	1050	1050	1050 / 35
DURATION TO FINAL TEMPERATURE-MINUTES	3.3	13.8	INDEF	INDEF	INDEF	0
FLOW RATE #/HR	340,000	340,000	320,000	340,000	340,000	340,000 -0
NUMBER OF CYCLES	1	1	1	1	1	1

REACTOR WATER CLEANUP
TRANSIENT-DISCHARGE LINE
NINE MILE POINT-2
NIAGARA MOHAWK POWER CORPORATION
STONE & WEBSTER ENGINEERING CORPORATION
SK-

NO. 24



RATE OF TEMP. CHANGE -°F/HR		100	-	-	-	-	4400	6500	100	100	3300	100	100	100	STEP	STEP	100	STEP	STEP	STEP	STEP	STEP	STEP	STEP
PRESSURE-PSIG	0-1250 / 1250-0	1050	1050	1050	1050	1050	1125	830	240	1050	830	240	1050	1050	100	100	100	0	1060 / 1100	1100 / 1125	1125 / 875	875 / 35		
DURATION OF FINAL TEMP - HR	-	-	-	-	-	-	5 SEC	5 SEC	-	-	5 SEC	-	-	15 SEC	1 SEC	30 SEC	CONT.	-	15 SEC	5 SEC	5 SEC	5 SEC	5 SEC	5 SEC
AVERAGE VELOCITY FT/SEC	-	-	-	-	-	-	-	-	-	-	-	-	-	8	10	10	10	-	7	7	7	7	7	7
NUMBER OF CYCLES (LIFE OF PLANT)	130	120	10,400	2000	10	70	40	40	40	40	140	140	140	111	111	111	111	123	10	10	10	10	10	10

NOTES:

1. SOLID LINE REPRESENTS TRANSIENT OF THE LINE 2-ICS-008-33-1 AND 2ICS*AOV157.
2. DASHED LINE REPRESENTS TRANSIENT OF LINES 2-ICS-006-87-1, 2-ICS-035-60-1, 2 ... 142-1, AND 2ICS*AOV156.

PAGE 1 OF 2
REF DWG EP-78A-F

REACTOR CORE ISOLATION COOLING
RETURN, AND HEAD SPRAY
NINE MILE POINT - UNIT 2
NIAGARA MOHAWK POWER CORPORATION
Stone & Webster Engineering Corporation

12177-SK-A96

NO. 25