ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED ELECTRICAL EQUIPMENT
IEB 79-01B

TECHNICAL EVALUATION REPORT

DOCKET NO. 50-282

DATED: November 17, 1980

384-2584

Licensee: Northern States Power Co.
Type Reactor: W PWR
Plant: Prairie Island Unit 1

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Reactor Construction and Engineering
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Introduction

This report is submitted in accordance with TI 2515/41[1/] for use as input to the Safety Evaluation Report on qualification of Class 1E electrical equipment installed in potentially "harsh" environmental areas at this facility.

Background and Discussion

IE Bulletin No. 79-01[2/] required the licensee to perform a detailed review of the environmental qualification of Class 1E equipment to ensure that the equipment would function under (i.e. during and following) postulated accident conditions.

The Technical Evaluation Report (TER) is based on IE's review of the licensee's submittal for conformance with the DOR guildelines or NUREG-0588, a site inspection of selected system components, to verify accuracy of the submittal, and EQB's review of component test reports.[3/]

Licensee submittals were received on March 13, 1980, May 12, 1980, May 23, 1980, July 10, 1980 and October 31, 1980.

The site inspection was completed on September 26, 1980.[4/] Generic and site specific guidance was requested from IE/NRR headquarters.[5/]

Summary of Licensee Actions/Statements

Based upon evaluation of Class 1E equipment, licensee believes he has complied with the requirements of Bulletin 79-01B. Licensee believes that with the completion of the action items noted, there will exist no outstanding items which would preclude the continued safe operation of Prairie Island Unit 1. Replacement of solenoid valves, limit switches and other instruments is being accomplished as material is received and scheduled for installation during the next outage. Unit 1 replacements and modifications which were not completed during the last outage, will be completed when material is received and operations permit or during the next scheduled outage; in any event, all modifications will be completed by June 1982.

1/ Technical Evaluation Report (TER) On Results Of Staff Actions Taken To Verify Reactor Licensee Response To IEB 79-01B And Supplemental Information.
2/ Environmental Qualification of Class 1E Equipment.
3/ Attachment 1.
4/ Attachment 2.
5/ Attachments 3a and 3b.

System Comparison

A comparison was made between the systems list provided by the licensee[6] and a similar list provided to IE by NRR[7] during a meeting in Bethesda, MD on September 30, 1980. The following systems were not included in the licensee's submittal.

- Pressurizer Spray
- Emergency Power
- Control Room Habitability
- Safety Equipment Area Ventilation

Equipment Evaluation

Class 1E equipment was evaluated, that is, placed into five separate categories.[8] Result of the evaluation follows: (See pages following)

Caveat

Test reports and other documentation which licensees referenced as establishing environmental qualification were reviewed for acceptability by NRR Environmental Qualification Branch. (Reference Attachment 3a, memorandum dated June 20, 1980 Hayes to Jordan.)

This TER does not include information about seismic of fire withstand capability. It should therefore not be inferred that Category I equipment meets all necessary qualification requirements.

Conclusion

Based on IE's review of the licensee's submittal, the site inspection, and licensee's proposed actions, it cannot be concluded that there is reasonable assurance all components installed at the Prairie Island Unit 1 are environmentally qualified and installation methods of environmentally qualified components would not contribute to the failure of such components during a potential accident.

A positive conclusion cannot be made until:

1. All matters referred to IEHQS/NRR have been satisfied.[9]

2. The 4 systems missing from the licensee's submittal have been evaluated by NRR. (Page 2)

3. The negative equipment evaluations have been reviewed by NRR. (Pages 4, 5, 6, and 8.)

6/ Attachment 4.
7/ Attachment 5.
8/ Attachment 6.
9/ Attachment 8.

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CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTI REFN	CONCUR?
Ia 2	MOV	Limitorque	SMB-00	FW to Stm Gen	AUX	69 Hrs	325	74.7	100	—	—	40 yr	1, 2, 3	Yes-A
Ia 4	MOV	Limitorque	SMB-00	RCP seal Wat Ret	AUX	69 Hrs	325	74.7	100	—	—	40 yr	1, 2, 3	Yes-A
Ia 5	MOV	Limitorque	SMB-00	Excess Letdwn	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	4, 1, 2	No-B, C
Ia 9	MOV	Limitorque	SMB-000	Fan Coil Unit Clg Wtr	CNT	64 Hrs	325	74.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	1, 2, 3	Yes-A
Ia 12	Motor	W	L1054-1760/875	Fan Coil Units	CNT	20 mos.	324	94.7	100	H_3BO_3 NaOH	2×10^6	40 yr	7	No-L, P, Q
Ia 13	Fan/motor	Joy	600277-69	Dome Recirc	CNT	1 Yr	300	84.7	100	Caustic	5×10^7	2.5 yr	8	No-M, P, Q
Ia 14	Sol. Vv.	ASCO	NP-8321A1E	Sup & Vent Dampers	CNT	30 days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.4 yr	9	No-G
Ia 20	MOV	Limitorque	SMB-000	Smplg & Venting	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^6	40	4, 1	No-B, C
Ia 20A	MOV	Limitorque	SMB-000	Smplg & Venting	Annulus	6 days	325	104.7	—	—	2.04×10^8	40	1	Yes-A
Ia 20B	Sol. Vv.	ASCO	NP-8320A194E	Air Supply & Vent	Annulus	30 days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.4 yr	9	No-G
Ia 27	Limit Sw	NAMCO	EA-170	Cntmt Purge (Ind)	Annulus	200 hrs	200	—	100	—	2.07×10^8	200% (?) 200 hrs	42	No-N
Ia 28A	Limit Sw.	Honeywell	BZ-2RW8942	CNTmt Purge (Ind)	Annulus	Continuous	180	5.92 (?)	—	—	1.3×10^8	5 yrs	43, 10, 11	No-N, G
Ia 28B	Sol. Vv.	ASCO	NP-8321A1E	Vac. Brkr.	Annulus	30 days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.4 yr	9	No-G
Ia 31	MOV	Limitorque	SMB-0	Cntmt Sp. Pp.	AUX	64 hrs	325	74.7	100	H_3BO_3 NaOH	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 32	MOV	Limitorque	SMB-0	Cntmt Sp Pp	AUX	64 hrs	325	74.7	100	H_3BO_3 NaOH	2×10^6	40 yr	1, 2, 3	Yes-A

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTS REQ'D	CONCUR? [10]
Ia 34	Press Xmtr	Foxboro	E11GM-SAD1	Accum	CNT	24hrs	318	104.7	100	H_3BO_3 NaOH	7.6×10^7	—	14	No-F,H,E
Ia 39	MOV	Limitorque	SMB-3	Stm. Gen. FW cntmt ISOL.	AUX	64Hrs	325	74.7	100	H_3BO_3 NaOH	2×10^8	40Yr	1, 2, 3	Yes-A
Ia 42A	RTD	SSTM	11901B	RCS Temp Wide	CNT	2WKS	320	80.7	100	H_3BO_3 NaOH	5×10^7	12Yr	17	No-G
Ia 42B	RTD	Rosemount	176KS	RCS Temp Wide	CNT	2WKS	320	80.7	100	H_3BO_3 NaOH	5×10^7	12Yr	17	No-G
Ia 45	Transducer	Fisher Controls	546	stm Gen Rlf	AUX	—	—	—	—	—	—	—	18	Yes-A
Ia 47	Sol. Vv.	ASCO	NP-8316E35E	MSIV	AUX	30days	300	84.7	100	H_3BO_3 NaOH	1.5×10^6	4.44Yr	9	No-G
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ia 55A	MOV	Limitorque	SMB-00	AFW Pp	AUX	64 hrs	325	74.7	100	H_3BO_3 NaOH	2×10^8	40	1, 2, 3	Yes-A
Ia 56	Limit Sw	NAMCO	D2400X	MSIV/(Ind) PORV	AUX	—	194/210 *	14.7/15.2 *	Water Spray	—	—	— *	20	No-O*
Ia 58	Limit Sw	NAMCO	D2400X	S/G & (Ind) PORV	AUX	—	194/210 *	14.7/15.2 *	Water Spray	—	—	— *	20	No-O*
Ia 74	MOV	Limitorque	SMB-00	Press. Rlf. Vv. Isol.	CNT	64hrs	325	74.7	100	H_3BO_3 NaOH	2.4×10^8	40	1, 2, 3	Yes-A
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ia 76A	Sol. Vv.	ASCO	NP-8316S4E	Press. Rlf. Vv.	CNT	30days	300	84.7	100	H_3BO_3 NaOH	1.5×10^6	4.44Yr	9	No-G
Ia 81	Sol. Vv.	ASCO	NP-8320A186E	Rx Clnt Samp.	CNT	30days	300	84.7	100	H_3BO_3 NaOH	1.5×10^6	4.44Yr	9	No-G
Ia 83	Sol. Vv.	ASCO	NP-8320A182E	SG Sampl Line	CNT	30days	300	84.7	100	H_3BO_3 NaOH	1.5×10^6	4.44Yr	9	No-G

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTI REFS	CONCUR? [101]
Ia 90	Motor	W	HSD-P	Class B RHR Pps	AUX	Not (N)? Required (R)	NR?	NR?	NR?	—	2×10^8	40 yr	21	No-J, N
Ia 96	MOV	Limitorque	SMB-00	SI PP Suct	AUX	69hrs	325	74.7	100	H_3BO_3 NaOH	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 97	MOV	Limitorque	SMB-00	SI PP - RHR HX	AUX	69hrs	325	74.7	100	—	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 100	MOV	Limitorque	SMB-1	Cntmt Sump B	AUX	69hrs	325	74.7	100	—	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 101	MOV	Limitorque	SMB-00	RCS Cld leg Inj	AUX	69hrs	325	74.7	100	H_3BO_3 NaOH	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 102	MOV	Limitorque	SMB-00	SI to Rx Vessel	AUX	69hrs	325	74.7	100	—	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 103	MOV	Limitorque	SMB-0	RWST Suct	AUX	69hrs	325	74.7	100	H_3BO_3 NaOH	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 104*	MOV	Limitorque	SMB-1	(-) Flood Accum	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	1, 2, 4	No-B,C,F,H
Ia 105	MOV	Limitorque	SMB-00	(-) Flood Cold leg Inj	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	1, 2, 4	No-B,C,F,H [101]
Ia 106	MOV	Limitorque	SMB-1	Lo Head Inj	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	1, 2, 4	No-B,C
Ia 107	MOV	Limitorque	SMB-00	Rx Vsl Inj Line	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	1, 2, 4	No-B,C
Ia 107A	MOV	Limitorque	SMB-00	Rx Vsl Inj (-) Flood	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2×10^8	40 yr	1, 2, 4, 44	No-B,C [101]
Ia 108	MOV	Limitorque	SMB-00	SI Suct BAT	AUX	69hrs	325	74.7	100	—	2×10^8	40 yr	1, 2, 3	Yes-A
Ia 109	Motor	W	HSD-P	SI Pump	AUX	Not (N)? Required (R)	NR?	NR?	NR?	—	2×10^8	40 yr	21	No. J, N
Ia 116*	Sol Vv	ASCO	NP8321A1E	Sln & Inst Air	CNT	30days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.4yr	9	No-G

[19] Attachment 9

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTI REF#	CONCUR? [10]
Ia 118	MOV	Limitorque	SMB-00	Stm Gen Iso	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	1, 2, 4	No - B, C
Ia 120	Fuse Holder	Bussman	HEB-A	MSIVs	AUX	5 Hrs	149	14.7	Imm	—	3.5×10^8	40 yr	23, 13	Yes - A
Ia 121	Lube Oil	Mobil	DTE-HVY MED	—	AUX	Not (N)? Required (R)	NR?	NR?	NR?	—	2×10^8	NR?	24	No - J, N
Ia 122	Grease	Chevron	SRI-2	—	AUX/ CNT	Not (N)? Required (R)	350	NR?	NR?	NR?	2×10^8	NR?	25, 7, 26	No - J, N
Ia 125A	Splice Kit	OKonite	604-92-1511	(-) Flood	AUX/ CNT	3 Mos	346	127.7	100	H_3BO_3 NaOH	2×10^8	40 yr	30, 31	No - F, H, Q
Ia 126	Cable, Power	OKonite	—	(-) Flood	AUX/ CNT	3 mos	346	127.7	100	H_3BO_3 NaOH	2×10^8	40 yr	30	No - F, H, Q
Ia 127	Cable, Pwr/Cont	Kerite	HTK & FR	(-) Flood	AUX/ CNT	3 WKS	320	94.7	100	H_3BO_3 NaOH	2×10^8	40 yr	1, 33, 34	No - F, H, Q
Ia 129	Cable, Inst	BIW	—	(-) Flood #	AUX/ CNT	24 Hrs / + 30 days	316	104.7	100	H_3BO_3 NaOH	2×10^8	40 yr	35, 36	No - O #, F, H
Ib 30	Motor	Elec Mach MFG	—	CNT SP Pump	AUX	Not (N)? Required (R)	NR?	NR?	NR?	—	1×10^8	40 yr	12, 13, 45	No - J, N
Ib 38	Flow xmtr	Foxboro	E13 DH (MCA)	Stm Gen FW In	AUX	24 hrs	307	74.7	100	—	—	—	14	No - E
Ib 130	Penetration	D.G. O'brien	S/N Pr-110 (HVP)	—	AUX/ CNT	48 hrs	270	66.7	100	H_3BO_3 # NaOH	3×10^8 #	—	37, 39, 38	No - H, R, S
Ib 131	Penetration	D.G. O'brien	S/N Pr-12 (LVP)	—	AUX/ CNT	10 days	270	66.7	100	H_3BO_3 NaOH	3×10^8 #	—	37, 38, 39	No - H, R, S
Ib B/A	Penetration	D.G. O'brien	S/N A-2 (TI)	—	AUX/ CNT	48 hrs	270	66.7	100	H_3BO_3 # NaOH	3×10^8 #	—	37, 38, 39	No - H, R, S
IIa	None	—	—	—	—	—	—	—	—	—	—	—	—	—
IIb 6	Limit Sw.	NAMCO	EA 180	(-) Flood Lt Dwn Iso Eng.	CNT	30 days	340	84.7	100	H_3BO_3 NaOH	2.04×10^8	40 yr	5, 6	No - F, H, I

[9] [10] Attachment 9 # Analysis Prairie Island # 1

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OPTIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATT1 REF[10]	CONCUR? [10]
IIb 7	Limit Sw	NAMCO	D2400X	(-) Flood Iron ISO IND	CNT	—	—	—	—	—	—	—	—	NO-F,H,I
IIb 15	Limit Sw	NAMCO	EA-180	Air Hold Damp Ind	CNT	30days	340	84.7	100	H_3BO_3 NaOH	2.04×10^8	40	5	Yes-A,T
IIb 20	Limit Sw	NAMCO	EA-180	Purg Exh Ind	CNT	30 days	340	84.7	100	H_3BO_3 NaOH	2.04×10^8	40	5	Yes-A,T
IIb 420	Incore Thermo Ref. Junct Box	ETI	K81	Sub Clg Meter	CNT	—	—	—	—	—	—	—	—	Yes-D
IIb 72	Limit Sw	NAMCO	EA-180	Pzr Rlf Vv Ind	CNT	30days	340	84.7	100	H_3BO_3 NaOH	2.04×10^8	40	5	Yes-A,T
IIb 78	Limit Sw	NAMCO	EA-180	Rad Monit	CNT	30 days	340	84.7	100	H_3BO_3 NaOH	2.04×10^8	40	5	Yes-A,T
IIb 114	Limit Sw	NAMCO	EA-180	Stm & Inst Air Ind	CNT	30days	340	84.7	100	H_3BO_3 NaOH	2.04×10^8	40	5	Yes-A,T
IIb 133	D.C. Dist Pnl	Creiger Elec	—	PWR to D.C. Aux	CNT	—	—	—	—	—	—	—	—	Yes-D,E
III	None	—	—	—	—	—	—	—	—	—	—	—	—	—
IVa 41	Accelerometer	Endevco	2273 AM20	Rlf. Vv. Monitor	CNT	—	—	—	—	—	—	—	16	Yes-U
IVa 42	Charge Amp	Unholz-Dickey	22CA-2TR	Rlf. Vv. Monitor	CNT	—	—	—	—	—	—	—	—	Yes-U
IVa 42c	Press Xmtr	Foxboro	E11GM SAE1 (MCA)	Pzr Press	CNT	24 hrs	300	74.7	100	H_3BO_3 NaOH	2×10^8	—	1	Yes-A,V No-W
IVa 63	Press Xmtr	Foxboro	E11GM (MCA)	Stm Press	AUX	24hrs	300	74.7	100	—	—	—	14	Yes-A,V
IVa 110	Flow Xmtr	Barton	332	SI	AUX	Not (N)? Required(2)	NR?	NR?	NR?	—	2×10^8	—	1	No-J,N,E
IVa 123	Terminal Block Coating	GE	74010/ 74010A	(-) Flood & Epoxy Vainish	AUX CNT	Not (N)? Required(2)	500°	NR?	Wat. Res	H_3BO_3 NaOH	3.6×10^7	—		No-F,H,O[8]y Yes-X

[10] Attachment 9

Prairie Island # 1

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTI REF	CONCUR ? [10]
IVa 124	Terminal Block/Strip	Allen Bradley	1492-CD3	—	AUX CNT	*	*	*	*	*	*	*	—	No-Y, J* Yes-X
IV Jr 426	Press Xmtr	Foxboro	E11GM-SAE1 (CX9)	Prz Press	CNT	24 hrs	300	747	100	H_3BO_3 $NaOH$	2×10^8	—	14	Yes-A, V No-W
V 18	Sol. Vv.	ASCO	RHT8321A1	Air Hndlg Units	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 23	Sol Vv	ASCO	8321A1	Vacuum Breaker	Annulus	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 25	Limit Sw	NAMCO	D2400X	CNT Purg Ind	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 28	Limit Sw	NAMCO	D2400X	CNT Purg Ind	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 36	Level Xmtr	Magnetrul	A-153 FEP/VAXY TD	CNT (-flow) SUMP Level	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 42C	Press Xmtr	Foxboro	E11GH	RC3 Press	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 62	Flow Xmtr	Barton	384	stm Flow to Rx Prot	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 64	Level Xmtr	Foxboro	E13DH-SAM1	stm Gen Lev to Rx Prot	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 79	Limit Sw	NAMCO	D2400X	Rad Monit	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 85	Limit Sw	NAMCO	D2400X	Rx Hot Sampl.	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 91	Limit Sw	NAMCO	D2400X	RHR Ind	AUX	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 112	Sol. Vv.	ASCO	RHT8324J7	Stn & Inst Air	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2
V 115	Limit Sw	NAMCO	D2400X	Stn & Int. Air	CNT	—	—	—	—	—	—	—	—	Yes-D.O. 2

[9] Attachment 9

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTI REFN	CONCUR?
Ia 24	Sol. Vv	ASCO	NP8316S4E	CNT Purge	Annulus	30 days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.4 yr	9	No-G
Ia 46	Transducer	Fisher Cont	546	Stm Dump	Aux	—	—	—	—	—	—	—	18	Yes-A
Ia 113A	Sol. Vv	ASCO	NP8321A1E	Stm & Inst Air	AUX	30days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.44yr	9	No-G
Ia 113B	Sol. Vv	ASCO	NP8321A1E	Stm & Inst Air	CNT	30 days	300	84.7	100	H_3BO_3 NaOH	1.5×10^8	4.44yr	9	NO-G
Ia 98	MOV	Limitorque	SMB-3	(-) Flood Accum	CNT	6 days	325	104.7	100	H_3BO_3 NaOH	2.0×10^6	40	1,2,4	No-B,C, F,H
V 20c	Sol. Vv.	ASCO	RHB-8320A1	H_2 Cont	Annulus	—	—	—	—	—	—	—	—	Yes-D,O
V 28c	Limit Sw.	NAMCO	D-2400-X	Cntmt Purge	Annulus	—	—	—	—	—	—	—	—	Yes-D,O
V 50	Sol. Vv.	ASCO	8211D4	Main & Aux Stm Dump	AUX	—	—	—	—	—	—	—	—	Yes-D,O
V 53	Sol. Vv.	ASCO	HP8211D4	Main & Aux Stm Dump	AUX	—	—	—	—	—	—	—	—	Yes-D,O
V 55	Sol. Vv.	ASCO	8211D4	Main & Aux Stm Dump	AUX	—	—	—	—	—	—	—	—	Yes-D,O
V 75	Sol. Vv.	ASCO	831654	Prsr Rlf Vv.	CNT	—	—	—	—	—	—	—	—	Yes-D,O
V 82	Sol. Vv.	ASCO	RHT8321A1	Rx Hot Smplg	CNT	—	—	—	—	—	—	—	—	Yes-D,O
V 84	Sol. Vv.	ASCO	RHT8320A19	Rx Hot Smplg	CNT	—	—	—	—	—	—	—	—	Yes-D,O

10) 11) Attachment 9

Prairie Island # 2

1.	WCAP 7410-L	Motorized Valves
2.	WCAP 7744	Motorized Valves
3.	FIRL F-C3271	Motorized Valves
4.	Limitorque Project 600456	Motorized Valves
5.	ACME Cleveland Test Plan 8-31-77	Limit Switches
6.	Letter 5-12-80 NSP-NRC	Limit Switches
7.	WCAP 7829	Fan Motors
8.	Joy MFG A-411	Fan Motors
9.	ASCO Test Report AQS 21678/TR Rev. A	Solenoid Valves
10.	Honeywell Catalog 50, Page E-2	Limit Switch
11.	Engineering Test Lab, Bulletin 6	Limit Switch
12.	Letter 3-25-80 E/M-NSP	Motor
13.	Letter 9-29-80 NSC-NSP	Motor/Fuse Holder
14.	WCAP 8541	Transmitter
15.	Magnetrol TR 9306	Transmitter
16.	Letter 11-30-79 BSP-B&W	Accelerometer
17.	WCAP 9157	RTD
18.	Letter 3/80 NSP-NRC	Signal Converter
19.	Letter 3/78 NSP-NRC	Limit Switch
20.	Letter 7/80 NSP-NRC	Limit Switch
21.	WCAP 8754	Motor
22.	WCAP 7410-C	Transmitter
23.	MIL-STD-202D	Fuse Holder
24.	Letter 2-7-80 Mobil Oil-NSP	Lube Oil
25.	Letter 10-30-79 Chevron USA-NSP	Grease
26.	Letter 1-19-77 W -Wis/Minn Power	Grease
27.	Letter 11-21-78 GE-NSP	Epoxy Varnish
28.	Letter 8-7-78 GE-GE	Epoxy Varnish
29.	GE Insulating Materials Products Data, 74010A Epoxy Resin and 74010 Epoxy Catalyst; Effect of Radiation on Materials	Epoxy Varnish
30.	Okonite Test Procedure	Cable
31.	Letter 8-31-78 Okonite-NSP	Cable
32.	WCAP 7410-L Vol. II	Cable
33.	FIRL F-C2737	Cable
34.	Kerite KPT-LVC-1	Cable
35.	BIW B901	Cable
36.	BIE B904	Cable
37.	D.G. O'Brien C19QA053	Penetration
38.	Letter 6-20-78 Fluor-Pioneer-WPS	Penetration
39.	D. G. O'Brien ER-192	Penetration
40.	LOCA Qualification of Kerite 1000v FR Insulated, FR Jacketed Cables 3-10-80	Splice Kits
41.	Qualification Tests of Electrical Cables Under Simulated Post-Accident Rx Cntmt Service Cond. R-C2737 4-15-70	Splice Kits
42.	ACME Cleveland Test Plan 7-24-78	Limit Switch
43.	Nuclear Radiation and Switch Applications	Limit Switch
44.	PINGP's ECCS Actuation Study	Mov
45.	Numerous Tests on Various Ins. Mat'l	Motor

Test Reports
ATTACHMENT 1

Jablonski

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

September 26, 1980

MEMORANDUM FOR: E. L. Jordan, Assistant Director, Division of Reactor Operations Inspection, IE:HQ

THRU: G. Fiorelli, Chief, Reactor Construction and Engineering Support Branch

FROM: D. W. Hayes, Chief, Engineering Support Section 1

SUBJECT: SCREENING REVIEW OF LICENSEE RESPONSE TO IEB 79-01B AND SUMMARY OF INSPECTION OF INSTALLED SYSTEMS AT PRAIRIE ISLAND 1 AND 2 - DOCKET NOS. 50-382, 50-306

Frank Jablonski has completed the inspection phase at Prairie Island Units 1 and 2 in response to IEB 79-01B. A walkdown was conducted on September 17, 1980 to inspect installed components associated with the systems listed on the attachment.

Observations:

Motor Operated Valves (MOV's)

MOV Nos. MV-32132 and MV-32135 were limitorque type SMB-000 with Reliance motors, Class "B" insulation; MOV No. MV-32068 was limitorque type SMB-00 with a Reliance motor, Class "HP" insulation. The referenced qualification documentation was Project Number 600456 which qualified motors with "RH" insulation[1].

MOV No. 32020 was limitorque type SMB-00 with a Reliance motor, Class "B" insulation. Class "B" is suitable outside containment. The referenced qualification documentation was WCAP 7410-L and 7744 which meet or exceed outside containment duty.

In all cases the MOV's were installed in accordance with manufacturer's recommendations. Both power and control cable were installed in flexible metallic conduit.

*Below flood level.

Dome Recirculation Fan

The fan unit was a Joy Axivane series 1000, Model No. 018-1Y-3450, Serial No. SF27974-1, Motor No. 600277-69. The referenced qualification

Onsite Inspection Report
ATTACHMENT 2

documentation was Joy Manufacturing Report No. X-411; that test report was for Motor No. 600277-69. All requirements appear to have been met.

Solenoid Valves

All of the solenoids listed on the attachment were scheduled for replacement, however, discrepancies existed between solenoids listed on the component evaluation sheets and those actually installed. For example, solenoid Nos. 33374 and 33377 were listed as RHT832427; type RHT8321A1 installed. Similar discrepancies existed with solenoid Nos. 33440 and 33441[1].

In all cases the installation met manufacturer's recommendations, i.e., installation in any position was acceptable. Cable was installed individually or in combination rigid steel/flexible metal conduit. Terminations were made in standard handy boxes, i.e., without gasketed cover; open to atmosphere. (Refer to Terminations, below).

Limit Switches

Limit Switch Nos. CD-34074 and CD-34078 were NAMCO Model EA-180. Qualification reference document was ACME-Cleveland Test Plan, August 31, 1977. The licensee is considering the installation of hermetic sealing units at the interface of the limit switch and flex/rigid conduit.

Component evaluation sheet for switch No. CV-31107, a NAMCO model D2400X, was not shown to be qualified for aging, operating time, or pressure[1].

Instruments

Instrument Nos. 16796* and 23015, containment sump level and main steam flow respectively, will be replaced. The installed instrument models were Magnetrol A-153FEP/VPXY-TDM and Barton 384.

The incore thermocouple reference junction boxes, ETI Model K81, used in conjunction with the subcooling meter will be replaced.

E/P signal converter, No. SC35029, used to control a steam generator power operated relief valve (PORV) was identified by the licensee as not being environmentally qualified. The converter was a Fisher Controls type 546, contained in a NEC Class 1, Group D enclosure. The converter for the other power operated relief valve was located on the opposite side of the same room. Based on the information contained on page 2 of licensee

letter to NRC dated March 13, 1980, it could not be concluded that the signal converter for at least one PORV was adequate to effect an orderly cooldown, i.e., survive the specified environment of 210°F, 15.2 psia and 100% RH.[1]

*Below flood level.

Terminations

Various component termination devices were opened for inspection. Penetrations were terminated on Alan Bradley No. 1492 terminal blocks installed in large junction boxes with covered panels; with Okonite splices; or covered with what appeared to be Scotch 27 tape. The latter two types were not protected by junction boxes. The Okonite splices were qualified by test.

Other components such as solenoid valves and limit switches were terminated in junction boxes or handy boxes; however, no environmental credit was given to any protection which might be offered by the enclosures. The terminations were stated to have been covered with three layers of Scotch No. 70 tape, three layers of Permasel fiberglas tape and then a repeat of Scotch No. 70 tape.

NOTE: A component evaluation worksheet was not included with the submittal[1].

Conclusion

Except as reported above, motor insulation, solenoid valves, signal converters and terminations, the equipment descriptions provided by the licensee on the system component evaluation worksheets for the systems identified were complete and accurate.

[1]The licensee was made aware of these discrepancies. A detailed review will be made by the licensee and the response amended.

D. W. Hayes, Chief
Engineering Support Section 1

Attachment: As Stated

cc:
J.G. Keppler
G. Fiorelli
C. Fierabend, Res. Insp.
V. D. Thomas, IE:HQ

ATTACHMENT 2

ATTACHMENT

LIST OF COMPONENTS

NUMBER	UNIT	GENERIC NAME	SYSTEM	INSIDE	OUTSIDE
MV-32132	1	Motor Operated Valve	CL	X	
MV-32135	1	Motor Operated Valve	CL	X	
MV-32068	1	Motor Operated Valve	SI	X	
MV-32020	2	Motor Operated Valve	MS		X
11 (DRF)	1	Dome Recirculation Fan	ZC	X	
SV-33374	1	Solenoid Valve	ZC	X	
SV-33377	1	Solenoid Valve	ZC	X	
SV-33440	1	Solenoid Valve	ZP	X	
SV-33441	1	Solenoid Valve	ZP	X	
SV-33261	2	Solenoid Valve	MS		X
SV-33265	2	Solenoid Valve	MS		X
CD-34074	1	Limit Switch	ZC	X	
CD-34078	1	Limit Switch	ZC	X	
CV-31107	2	Limit Switch	MS		X
16796	1	Level Transmitter	CS	X	
23015	1	Flow Transmitter	MS	X	
15456	1	Junction Box	RC	X	
SC35029	2	Signal Converter	MS		X
———	1	Terminations	ALL	X	

ATTACHMENT 2

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

July 23, 1980

MEMORANDUM FOR: E. L. Jordan, Assistant Director, Division of Reactor Operations Inspection, IE:HQ

THRU: G. Fiorelli, Chief, Reactor Construction and Engineering Support Branch

FROM: D. W. Hayes, Chief, Engineering Support Section 2

SUBJECT: IEB 79-01B (A/I F03067180)

Attached is a copy of a memorandum dated July 17, 1980 received from Frank Jablonski relative to IEB 79-01B. It is being forwarded for your information and solicited guidance.

The question of identification of safety related systems and components (paragraph No. 1 of the memo) is an old one. I disagree with Frank in that I feel that this identification is a responsibility of the licensee, not the NRC. He must know his plant. I do agree, however, that more guidance is needed for our inspectors in this area. This is especially important for those inspectors that have not had reactor operating experience.

The significant differences in master lists that Frank discusses in paragraph two does raise questions. We can only compare these lists against the SAR. Review and evaluation beyond this is assumed to be an NRR function.

In regard to Frank's question - should we assume the licensee's response to IEB 79-01B to be complete and correct - I have told him yes. Further, that if he identifies significant incompleteness in the response, or incorrect information during his reviews, to bring these to my attention so appropriate action can be recommended.

Comments and further guidance is requested concerning matters discussed in paragraphs 3 and 4 of Frank's memo.

D. W. Hayes

D. W. Hayes, Chief
Engineering Support Section 2

Generic Issues
ATTACHMENT 3a

Dupl of

8012310083

Attachment:
F. J. Jablonski Memo to
D.W. Hayes dtd 7/17/80

cc w/attachment:
. G. Keppler, RIII
V. D. Thomas, IE:HQ
A. Finkel, RI
R. Hardwick, RII
D. McDonald, RIV
J. Ellin, RV
R. F. Heishman, RIII
→ F. J. Jablonski, RIII

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

July 17, 1980

MEMORANDUM FOR: D. W. Hayes, Chief, Engineering Support Section 1

FROM: F. J. Jablonski, Reactor Inspector

SUBJECT: FORMULATING TECHNICAL EVALUATION REPORTS (TER) - REVIEW OF IEB 79-01B
RE: MEMO TO YOU DATED JUNE 16, 1980 - SAME SUBJECT

Since the review of IEB 79-01B is continual, new discrepancies continue to show up; discrepancies are not necessarily the licensees'. As you know, there is no specific nuclear power plant design required by NRC. Further, the designation of safety related systems is somewhat arbitrary and inconsistent. In fact, the NRC places responsibility for classifying safety related systems on the licensee.

Action Item No. 1 of 79-01B requested each licensee to provide a "master list" of all ESF systems in their respective plant required to function during a postulated accident. Appendix A to 79-01B lists "typical" equipment/functions needed for mitigation of an accident. A comparison of master lists was made of four licensees with similar Westinghouse PWRs (see Attachment 1). Arbitrary selection and non-standard nomenclature of systems makes evaluation of the master lists extremely difficult. NRC requested each licensee to submit the information under oath. Should the information therefore be assumed complete and correct?

It is extremely frustrating to review responses which vary so much in attention to detail, depth of review, etc. As stated previously in the draft TER for D.C. Cook, because I as a principal reviewer lack detailed systems/operations experience, further guidance is requested.

Another TER related matter is motorized valves equipped with Limitorque operators (see Attachment 2). As can be seen, each test report is for a specific unit type including motor type and insulation class. Almost all licensees refer to the various test reports as qualification documentation for all series of operator types; never is name plate data provided. For example, test report No. 600456 (SMB-0-40, Reliance Motor with Class RH insulation) may be listed for all operators from series SMB-000 to SMB 5; motor name plate data not provided. Without the name plate data and the basis for extrapolation, a meaningful evaluation cannot be made.

Dupe

8012310089

ATTACHMENT 3a

It is requested that this memorandum be forwarded to IE:HQS as an addition to A/I F03067180 with the same copy distribution.

F. J. Jablonski

F. J. Jablonski
Reactor Inspector

Attachments:
1. Comparison of Master Lists
2. Motor Operated Valve Tests

cc:
J. G. Keppler
G. Fiorelli

ATTACHMENT 3a

ATTACHMENT 1

SYSTEMS	P. A.	COOK	KEW.	PT. BCH.
Aux. F.W.	X	X		X
Chem. & Vol. Cont.	X	2	X	X
Cntmt. Air Hndlg.	X	X		X
Cntmt. H_2 Cont.	X	X		
Cntmt. Sp.	X	X		1
Main Stm.	X	X		X
Aux. Stm.	X			
Stm. Dump	X			
Rx Clnt.	X	X	X	X
Res. Ht. Rm.[1]	X	2	X	3
Saf. Inj.[1]	X	2	X	X
Clg. Water	X			
Esnt'l. Serv. Wat.		X		
Comp. Clg. Wat.		X		3
Emerg. Core Clg.[2]	1	X	1	
Aux. Clnt.[3]				X
Cntmt. Purge	X			
Rx. Bldg. Vent			X	
Inst. & Prot.	X			
Rx. Trip. Act.		X		
Rx. Cont. & Prot.				X
Rad. Monit.	X			
Rx. Hot Samp.	X			
Stn. & Inst. Air	X			
Stm. Gen.BD	X			
Post Acc. Monit.		X		
Rem. Sht. dn. Monit.		X		
Cntmt. Isol.		X		X
Mn. Stm. Isol.		X		
Mn. FW Isol.		X		

ATTACHMENT 3a

ATTACHMENT 2

MOTOR OPERATED VALVES

MOV's

1. There are basically two type series of Limitorque operators: SMB and SB. The operators are sized from 000 (smallest) to 5 (largest) as follows:

SMB-000
SMB-00
SMB/SB-0[1]
SMB/SB-1
SMB/SB-2
SMB/SB-3
SMB/SB-4
SMB-5

This series may also include SB

This series may also include WB

This series may be suffixed "T"

2. Test Reports include:

Report No.	Date	Unit Type	Environment	Motor Type	Insulation
a. 600198	1-2-69	SMB-0-15*	PWR No Radiation	Reliance	Special Hi Temp
b. 600426 (B-0009)	4-30-76	SMB-0-25*	BWR 1×10^7 R 340°	Peerless DC	H
c. 600376A FIRL F-C 3441	5-15-76	SMB-0-25*	BWR 2×10^8	Reliance	RH
d. 600456	12-9-75	SMB-0-40*	PWR 2×10^8	Reliance	RH
e. 600461	6-7-76	SMB-0-25*	Outside Cntmt, 2×10^7	Reliance	B
f. WCAP7410L 7744	12-70 8-71	SMB-00			B

*denotes foot pounds of torque
[1]only SMB-0 has been tested seismically Re: a, b, c

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SSINS #6820

JUL 3 1980

MEMORANDUM FOR: Z. R. Rosztoczy, Branch Chief, Equipment Qualification Branch, Division of Engineering, NRR

THRU: Haw for E. L. Jordan, Assistant Director for Technical Programs, Division of Reactor Operations Inspection, IE

FROM: V. D. Thomas, Task Manager, Review Group, IEB 79-01B, Divisic of Reactor Operations Inspection, IE

SUBJECT: REQUEST FOR NRC POSITIONS ON REVIEW QUESTIONS OF IEB-79-01B LICENSEE RESPONSES

In accordance to our verbal agreement, we would be happy if you would provide positions on the questions noted in the enclosed memorandi.

Since it is essential to establish a uniform approach to the review effort to obviate the questions being generated in the on-going review of licensee responses, we will be happy to meet with your staff to discuss these concerns to expedite resolution of the issues.

Vincent D Thomas

Vincent D. Thomas, Task Manager
Review Group, IEB 79-01B

Enclosures:
1. Memo D. W. Hayes to G. Fiorelli, RIII dated June 20, 1980.
2. Memo F. Jablonski to D. Hayes, RIII dated Jun 16, 1980.
3. Memo F. Jablonski to D. Hayes, RIII DATED June 10, 1980

cc: w/enclosures
E. L. Jordan, IE
V. S. Noonan, NRR
G. Fiorelli, RIII
D. W. Hayes, RIII
A. Finkel, RI
R. Hardwick, RII
F. Jablonski, RIII
D. McDonald, RIV
J. Elin, RV

JUL 7 1980

Dupl f 8008070229

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 20, 1980

MEMORANDUM FOR: E. L. Jordan, Assistant Director, Division of Reactor Operations Inspection, IE:HQ

THRU: G. Fiorelli, Chief, Reactor Construction and Engineering Support Branch

FROM: D. W. Hayes, Chief, Engineering Support Section 1

SUBJECT: IEB 79-01B (A/I F03067180)

Attached are two memorandums from one of my inspectors, Frank Jablonski. The first is dated June 10, 1980 and the second June 16, 1980. Both memos raise basic questions for which we require guidance to complete our review of responses to IEB 79-01B.

By this memo I also would like to confirm our understanding that NRR (Environmental Qualification Branch) will review for acceptability all test reports and other documentation which licensees reference as establishing environmental qualification of instrument/electrical equipment. In connection with this, we are sending under separate cover test reports, etc. in our possession to be forwarded to the Environmental Qualification Branch. (We further understand that the IEB 79-01B task group, on a volunteer basis, may agree to review some of these documents).

The status or schedule for site inspections and review/evaluation of the final reports is also attached. Please note that every licensee has asked for some sort of time extension to submit their first report. We understand that the other regions have had similar reporting problems. Assuming that all our licensees meet their extended submittal dates, we should complete our site inspections, reviews, and technical evaluation

Dupl f

8008070232

ATTACHMENT 3a

reports by the end of December 1980. Further delays in the submittals or any unforeseen events will hamper our ability to meet the new February 1, 1981 deadline.

D. W. Hayes, Chief
Engineering Support Section 1

Attachments:
1. Memo F. Jablonski to D. Hayes 6/10/80
2. Memo F. Jablonski to D. Hayes 6/16/80
3. Inspection Status/Schedule
4. "Separate Cover" List (Test Reports Sent to IE:HQ)

Separate Cover: See Attachment 4

cc w/attachments 1, 3, & 4 only:
J. G. Keppler
G. Fiorelli
V. D. Thomas, IE:HQ
A. Finkel, RI
R. Hardwick, RII
D. McDonald, RIV
J. Elin, RV
R. F. Heishman

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 10, 1980

MEMORANDUM FOR: D. W. Hayes, Chief, Engineering Support Section 1

FROM: F. J. Jablonski, Reactor Inspector

SUBJECT: EFFECT OF PREVIOUS NRR REVIEW ON MATTERS RELATING TO IEB 79-01B

In almost every licensee response to IEB 79-01B there is a subtle or direct reference to matters apparently reviewed by NRR. Because of the referenced dates it is assumed by me that NRR has given either tacit or direct approval to the references; examples follow:

1. All licensees refer to their FSARs for establishing the list of engineered safety feature systems and environmental data such as temperature, pressure, radiation, etc.

2. One licensee, Wisconsin Public Service Corporation, states that "The AEC, in their "Safety Evaluation of the Kewaunee Plant", Section 7.5, issued July 24, 1972, concluded that our criteria and testing program for environmental qualification were adequate". It is further stated that "Our FSAR, which was approved by the AEC, discusses at length the post accident conditions and required qualifications for applicable equipment. (See Section 7.5 of the Kewaunee FSAR.)"

3. Two licensees, American Electric Power and Wisconsin Public Service Corporation, have discussed the effect of components below flood level simply by referencing letters previously submitted to the NRC, or FSAR questions/answers as follows:

   * AEP - Letter dated 9-22-75 from Tillinghast (AEP) to Kniel (NRC); FSAR question 40.10 Appendix Q.

   * WPSC - Letter dated 2-2-76 from James (WPSC) to Purple (NRC).

Dupl f

8008072238

ATTACHMENT 3a

My specific concerns are:

Is it to be assumed that the referenced FSAR parameters, No. 1 above, are correct, i.e. reviewed by NRR?

If the answer is yes, then should it also be assumed that No. 2 above is likewise adequate? (If the answer is no, then none of the licensee responses which reference the FSAR can be assumed to be correct.)

Reference No. 3, even though a component may not be required to operate subsequent to flooding, what effect will short circuits have on containment electrical penetrations? Was this considered by NRR?

I am requesting that these questions/concerns be forwarded to the Assistant Director, Division of Reactor Operations Inspection for resolution.

F. J. Jablonski

F. J. Jablonski
Reactor Inspector

cc:
J. G. Keppler
G. Fiorelli

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 16, 1980

MEMORANDUM FOR: D. W. Hayes, Chief, Engineering Support Section 1

FROM: F. J. Jablonski, Reactor Inspector

SUBJECT: FORMULATING TECHNICAL EVALUATION REPORTS (TER) - REVIEW OF IEB 79-01B

In accordance with IEB 79-01B, an overall conclusion relative to the qualification of instrument electrical equipment is to be made for each operating plant based on a screening review of all plant systems, and by a detailed review and observation of specific system components. Unresolved concerns previously identified by RIII inspectors during reviews of IEC 78-08 and IEB 79-01 along with subsequently identified concerns make it difficult for us to formulate meaningful TERs for certain plants. The previous unresolved concerns are documented in the memorandums listed below (1,2,3) and are reiterated in Attachment A to this memo. Subsequently identified concerns are listed in Attachments B, C, and D.

To assure uniform evaluation, guidance is needed for these items. Please forward these concerns to IE:HQ.

1. TI 2515/13 - Qualification of Safety Related Electrical Equipment Fiorelli to Sniezek, 10/13/78

2. Same title as 1., Fiorelli to Klinger, 12/78

3. Review Status of Responses to IEB 79-01, Hayes to Jordan, 9/5/79

F. J. Jablonski

F. J. Jablonski
Reactor Inspector

Enclosures: As Stated

cc:
J. G. Keppler
G. Fiorelli
V. D. Thomas, IE:HQ
A. Finkel, RI
R. Hardwick, RII
D. McDonald, RIV
J. Elin, RV

ATTACHMENT 3a

Dupe of 8008070241 8008070241