

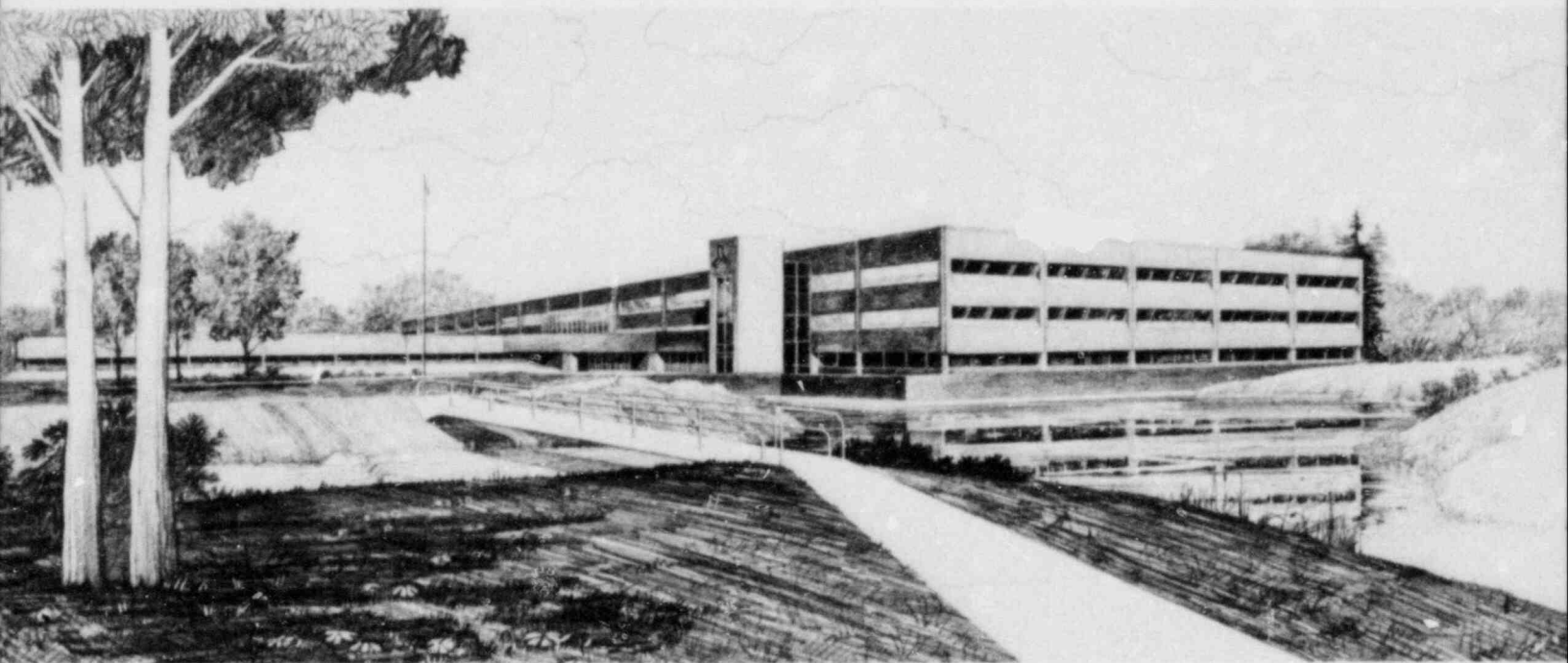
AUDIT OF THE ENVIRONMENTAL QUALIFICATION OF
SAFETY-RELATED ELECTRICAL EQUIPMENT AT THE ST. LUCIE
UNIT 2 NUCLEAR GENERATING STATION

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Operated by the U.S. Department of Energy



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INTERIM REPORT

AUDIT OF THE ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED
ELECTRICAL EQUIPMENT AT THE ST. LUCIE UNIT 2 NUCLEAR GENERATING STATION

Docket No. 50-389

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ABSTRACT

EG&G Idaho, Inc., and NRC Staff members conducted an onsite and control file audit of the St. Lucie Unit 2 Nuclear Generating Station (SL2) to determine the environmental qualification of safety-related electrical equipment. Results of the audit are summarized in this report.

FOREWORD

This report is supplied as part of the "Equipment Qualification Case Reviews" being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Engineering, Equipment Qualification Branch, by EG&G Idaho, Inc., Reliability and Statistics Branch.

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NRC FIN No. A6415
Equipment Qualification Case Reviews

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AUDIT OF THE ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED

ELECTRICAL EQUIPMENT AT THE ST. LUCIE UNIT 2 NUCLEAR GENERATING STATION

1.0 INTRODUCTION

On July 13-16, 1982, a team composed of representatives of the Reliability and Statistics Branch of EG&G Idaho, Inc. and NRC staff conducted an audit of the environmental qualification of safety related electrical equipment at the St. Lucie Unit 2 (SL2) Nuclear Generating Station. The work effort consisted of: (a) a pre-audit review of the applicant's submittal,¹ (b) an audit of the applicant's central files for selected equipment items, and (c) an onsite visual inspection of the equipment items for which the central files were audited. Qualification concerns and comments for individual equipment items are provided in Appendix A. Summaries of the central file reviews are provided in Appendix B.

2.0 EVALUATION

General concerns and comments resulting from both the audit and the pre-audit review of the SL2 submittal are as follows:

1. In some cases the applicant's review of the qualification files should have been more thorough and was found only marginally adequate.
2. It was observed during the on-site visual inspection that the applicant may not have accurately verified equipment elevations. The HPSI pump is claimed to have an elevation of -1 foot in an area where the flood level is -10 feet. The applicant did not know from what point on the HPSI pump the -1 foot elevation was measured and since the base of the pump was at -10 feet, it appears that the pump is much lower than stated. Any equipment not qualified for submergence should be so qualified or verified to be located above flood level.

3. The applicant will furnish information on the SL2 maintenance and surveillance program, which is still in development, at a later date.
4. The applicant will update the component evaluation sheets (CES) with all the latest field verification data.
5. Revision 3 of the submittal should contain the zone maps used in equipment qualification; not "typical" maps.
6. Components whose qualified lives are less than 40 years and those needing periodic parts replacement to attain a 40-year qualified life should have notes added specifying replacement intervals, future qualification plans, or a plan of action. Where replacement is scheduled, the qualified replacement should be identified.

3.0 CONCLUSIONS

As a result of the audit it was concluded that the St. Lucie Unit 2 environmental qualification program is adequate. When the applicant resolves the concerns noted above and in the appendices their program should be complete and in accordance with NRC approved regulations² and standards.³

4.0 REFERENCES

1. Environmental Qualification Report and Guidebook, Revision 3, St. Lucie Unit 2 Nuclear Generating Station.
2. Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment, NUREG-0588.
3. IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations, IEEE Std. 323-1974.

APPENDIX A
EQUIPMENT QUALIFICATION CONCERNS AND COMMENTS

TABLE A-1. QUALIFICATION CONCERNS AND COMMENTS FOR EQUIPMENT CLAIMED AS QUALIFIED

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a	
Fan Motor	Westinghouse	L-987971	2HVE-6A	0142	Qualification method is not given. Notes 3, 5.	
			2HVE-6B	0143		
Valve operator	Limitorque	SMB-000-2H1BC	FCV-3301	0472	Notes 1, 3.	
			FCV-3306	0474		
			LO-SMB-025	MV-08-14		1031
				MV-08-15		1034
				MV-08-16		1037
		DK56H	MV-08-17	1039		
Flow Transmitter	Rosemount	11530B5	FT-09-2A1	0635	Notes 1, 3, 5, 7.	
			FT-09-2A2	0636		
			FT-09-2B1	0637		
			FT-09-2B2	0638		
			FT-09-2C1	0639		
			FI-09-2C2	0640		
				FT-2212		0655
Pump Motor	GE	5K811052C57	HPSI P 2A	0782	Notes 1, 5.	
			HPSI P 2B	0783		
Valve Operator	Limitorque	LO-SMB-0-15	MV-08-18A	1041		
			MV-08-18B	1042		
			MV-08-19A	1043		
			MV-08-19B	1045		
				MV-08-3		1047
		LO-SMB-000				
Differential Pressure Transmitter	Rosemount	11530B3	PDT-25-14A	1157		
			PDT-25-14B	1158		
Pressure Transmitter	Rosemount	1153G89	PT-08-1A	1310	Notes 1, 3, 5.	
			PT-08-1B	1311		
			PT-08-3A	1312		
			PT-08-3B	1313		
			PT-08-5	1314		
			PT-09-8A	1315		
			PT-09-8B	1316		
			PT-09-8C	1317		
				PT-2212		1330
Fan Motor	Westinghouse	T8DP/7908 7908 T8DP/7906	2HVE-9A	1796	Notes 1, 3, 5.	
			2HVE-9B	1798		
			2HVS-4A	1806		
			2HVS-4B	1807		
Med. Voltage Power Cable	OKUNITE	B/M D15	B/M D15 Series	1939	Note 1.	

5

TABLE A-1. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
H2 Recombiner	Westinghouse	Model b	H2 RMB 2A H2 RMB 2B	1941 1944	Qualification file did not support the applicants claim for qualified awaiting confirmatory data.
Cable Pulling Lubricant	Bishop Electric Company	Bishop #45	CPL/ Bishop 45	0020	Does not perform safety function but must not damage safety related equipment.
	Polywater	Polywater	Polywater	0021	
Terminal Box	See Drawing B404	See Drawing B404	B2G87	0136	These boxes were not tested because the equipment contained inside were individually reviewed for qualification. Note 1.
			B2G88	0137	
			B2G89	0138	
			B2G90	0139	
			B2G91	0140	
			B2G92	0141	
			B2G87	0136	
			B2G88	0137	
			B2G89	0138	
			B2G90	0139	
			B2G91	0140	
			B2G92	0141	
			B215A	0158	
			B2166	0159	
			B2191	0160	
			B2192	0161	
B2194	0162				
B2195	0163				
B2197	0164				
B2198	0165				
B257A	0168				
B258A	0169				
B2725	0170				
B2726	0171				

a. See Table A-3 for notes.

TABLE A-2. QUALIFICATION CONCERNS AND COMMENTS FOR EQUIPMENT NOT CLAIMED AS QUALIFIED

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Radiation Detector	General Atomic	RD-23	RD-26-40 RD-26-41	0018 0019	The RD-6 detectors have not been reviewed. Notes 1, 3, 4, 5, 6, 7, and 8.
	General Atomic	RD-6	RD-26-3 RD-26-4 RD-26-5 RD-26-6	1426 1427 1428 1429	
Control Valve Actuator	Anchor/Darling	64324-c/001 series/E93281	HCV-09-1A HCV-09-1B HCV-09-2A HCV-09-2B	0744 0745 0746 0747	The review of the qualification file should have been more thorough and was found only marginally adequate. CES states there are deficiencies in documentation, but they are not listed in CES. Notes 1, 3, 5, 7.
Control Valve	Valtek-MARK II	--	FCV-26-1	0466	Not qualified. Test report not received.
Solenoid	Valcor Engr. Co.	V52600-515	FSE-27-10 FSE-27-11 FSE-27-12 FSE-27-13 FSE-27-14 FSE-27-15 FSE-27-16 FSE-27-17 FSE-27-18 FSE-27-8 FSE-27-9	0617 0618 0619 0620 0621 0622 0623 0624 0625 0626 0627	Post DBA specified operability is <41 days, but Dem. operability is only >33 days. Does field verified at elevation >26 feet mean the valves will be relocated? Why will the valves located in the AB be field verified >25 feet? Notes 1, 2, 3, 5, 7, 8.
Solenoid Valve	Target Rock	77CC001	SE-05-1A SE-05-1B SE-05-1C SE-05-1D SE-05-1E SE-09-2 SE-09-3 SE-09-4 SE-09-5	0004 0005 0006 0007 0008 0009 0010 0011 0012	Spec. post DBA oper. is 1 minute, but dem. post DBA oper. is listed as 32 cycles and no time. Figure 10 is used for specified temperature and dem. qualif. temperature. What is the max. temperature the equipment is tested to, and does it envelope DBA temperature? Figure 9 is used for spec. pressure and dem. qualif. pressure. What is the maximum pressure the equipment is tested to?
			Target Rock Target Rock	78E-001 78E-006	SE-03-1A SE-03-1B SE-03-1C SE-03-1D
Solenoid Valve	Target Rock	78E-007	SE-03-2A SE-03-2B	1443 1444	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
	Target Rock	77CC001	SE-02-01	1952	CES does not state whether valves are qualified for submergence. Notes 1, 3, 4, 5, 7, and 8.
	Target Rock	740-1005-1/5	SE-02-02	1953	
	Target Rock	740-003-1/110	SE-02-03	1954	
	Target Rock	740-003-1/4	SE-02-04	1955	
	Target Rock	77CC001	SE-08-1 SE-08-2	1956 1957	
Limit Switch	Namco	EA-170	ZS-25-18	0029	Notes 1, 2, 3, 5, 6, and 8.
			ZS-25-19	0030	
			ZS-25-120	0031	
			ZS-25-121	0032	
			ZS-25-122	0033	
			ZS-25-123	0034	
			ZS-25-118	0035	
			ZS-25-119	0036	
			ZS-25-94	0041	
			ZS-25-95	0042	
			ZS-25-116	0043	
			ZS-25-117	0044	
			Limit Switches	Namco	
ZS-25-11	1825				
Namco	EA-740 Series	ZS-25-12		1831	Outstanding items listed as "None". ZS-25-85 is missing the specified operability, aging, and submergence. Notes 1, 3, 4, 5, and 8.
		ZS-25-13		1832	
		ZS-25-14		1833	
		ZS-25-15		1834	
		ZS-25-16		1835	
		ZS-25-17		1836	
		ZS-25-2		1837	
		ZS-25-3		1848	
		ZS-25-4		1858	
		ZS-25-5		1877	
		Limit Switches		Namco	
ZS-25-7	1912				
Namco	EA-740 Series		ZS-25-74	1915	
			ZS-25-75	1916	
			ZS-25-76	1917	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
			ZS-25-77	1918	
			ZS-25-78	1919	
			ZS-25-79	1920	
	Namco	EA-740 20100	ZS-25-8	1921	
	Namco	EA-740 Series	ZS-25-80	1922	
			ZS-25-81	1923	
			ZS-25-82	1924	
			ZS-25-83	1925	
			ZS-25-84	1926	
			ZS-25-85	1927	
			ZS-25-88	1928	
			ZS-25-9	1930	
			ZS-25-92	1931	
			ZS-25-93	1932	
			ZS-25-96	1933	
			ZS-25-97	1934	
	Namco	EA1801302	ZS-25-36	1854	Notes 1, 3, 4, 5, 6, and 8.
			ZS-25-37	1855	
	Namco	EA180310302	ZS-25-38	1856	
	Namco	EA18032302	ZS-25-39	1748	
			HCV-14-2	0750	
			HCV-14-3A	0751	
			HCV-14-3B	0752	
	ASCO/NAMCO	S:NP8321A-2-E LS:EA74020100	HCV-14-6	0753	
	ASCO/NAMCO	S:NP8321A6	HCV-14-7	0754	
	ASCO/NAMCO	S:NP8321A1E LS:EA18021302	HCV-15-1	0758	
	ASCO/NAMCO	LS:FA18021302	HCV-18-1	0759	
	ASCO/NAMCO	S:RFHV202303 LS:EA18031302	HCV-3618	0765	
	ASCO/NAMCO	S:RFHV2023031 LS:EA18031302	HCV-3628	0769	
	ASCO/NAMCO	S:RFHV2023031	HCV-3638	0773	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Valve Operators	ASCO/NAMCO	S:RFHV2023031 LS:EA18021302	HCV-3648	0777	
	ASCO/NAMCO	S:NP8321A1ELS LS:EA18021302	LCV-07-11A	0851	
	ASCO/NAMCO	LS:EA180	LCV-07-11B	0852	
	ASCO/NAMCO	S:RFHV2023031	V2515	1657	
	ASCO/NAMCO	S:RFHV202301	V2516	1658	
	ASCO/NAMCO	S:RFHE2023031	V3571	1669	
Valve Operators	ASCO/NAMCO	S:RFHV2023031 LS:EA17031100	V3571	1690	
	ASCO/NAMCO		V2522 V2523 V2524 FCV-07-1A FCV-07-1B HCV-25-6A HCV-25-7A	2020 2021 2022 2023 2024 2025 2026	
Local Control Station	Gould	B/M	AUX FWP 2A PB AUX FWP 2B PB FCV-25-11 PB FCV-25-12 PB FCV-25-13 PB	0093 0095 0431 0433 0435	Figure C-1A is used for Spec. Temperature and Dem. Qualif. Temperature. What is the maximum temperature the equipment is tested to and does it envelope U&A temperature with margin?
	Gould	B/M C9-3A	HCV-3512 SS	0761	Figure C-1B is used for Spec. Pressure and Dem. Qualif. Pressure. What is the maximum pressure the equipment is tested to and does it envelope DBA pressure?
	Gould	B/M C10-16	HCV-3615 PB	0762	
	Gould	B/M C10-16	HCV-3625 PB	0766	What "TEST" is specified for operability?
	Gould	B/M C9-3	HCV-3657 SS	0779	Why is only 30 years aging specified? The goal is 40 years even though only 30 years can be demonstrated. What does "Minimum Lifegual" mean?
	Gould	B/M C10-2A	CHGG 2A PB CHGG 2B PB CHGG 2C PB	0181 0163 0185	The qualification is incomplete until the "Therm Lag Anal" is complete.
	Gould	B/M C8-5	CSP 2A Pd	0343	Notes 1, 3, 5, and 8.
	Gould	B/M C10-4B	CSP 2B Pb	0345	
	Gould	B/M C10-2A	LPSI P2A PB LPSI P2B PB	0866 0868	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Local Control Station	Gould	B/M C10-2B	MV-07-2A PB	1020	
	Gould	B/M	MV-07-2B PB	1022	
	Gould	B/M C10-2B	MV-08-1A PB	1024	
			MV-08-1B PB	1026	
	Gould	B/M	MV-08-12 PB	1028	
	Gould	B/M C10-2B	MV-08-13 PB	1030	
	Gould	B/M	MV-08-14 SELSW	1032	
			MV-08-15 SELSW	1035	
	Gould	B/M C9-1E	MV-08-16 SELSW	1038	
	Gould	B/M	MV-08-17 SELSW	1040	
			MV-09-10 PB	1050	
			MV-09-11 PB	1052	
			MV-09-12 PB	1054	
			MV-09-13 PB	1056	
			MV-09-14 PB	1058	
			MV-09-9 PB	1061	
			MV-14-10 PB	1065	
			MV-14-11 PB	1067	
			MV-14-12 PB	1069	
			MV-14-13 PB	1071	
MV-14-14 PB			1073		
MV-14-15 PB			1075		
MV-14-16 PB	1077				
Gould	B/M	MV-14-17 SS	1079		
		MV-14-18 SS	1081		
		MV-14-19 SS	1083		
		MV-14-20 SS	1087		
		MV-14-9 PB	1093		
Gould	B/M C9-3G	V2504 PB	1651		
Gould	B/M C10-2B	V2525 PB	1660		
Gould	B/M C10-3	V2553 PB	1662		
		V2554 PB	1664		
		V2555 PB	1666		
Gould	B/M C9-3	V3456 SS	1668		
Gould	B/M C9-3A	V3457 SS	1670		

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	SES Number	Comments ^a
Local Control Station	Gould	B/M C9-3G	V3495 SS	1675	
			V3496 SS	1676	
	Gould	B/M C10-4A	V3517 SS	1678	
	Gould	B/M C9-3B	V3523 SS	1679	
	Gould	B/M C9-7E	V3536 SS	1681	
	Gould	B/M C8-1E	V3539 SS	1683	
	Gould	B/M C9-3B	V3540 SS	1684	
			V3550 SS	1687	
			V3551 SS	1688	
	Gould	B/M	V3654 SS	1707	
			V3656 PB	1709	
	Gould	B/M C9-3A	V3658 SS	1711	
	Gould	B/M C8-5	V3659 SS	1713	
	Gould	B/M C9-1E	V3660 SS	1715	
	Gould	B/M C9-3B	V3664 SS	1717	
			V3665 SS	1719	
	Gould	B/M C9-9	V5203 SS	1723	
			V5204 SS	1724	
			V5205 SS	1725	
	Gould	B/M	2HVE-10B PB	1790	
		2HVE-6A PB	1794		
		2HVE-6B PB	1795		
		2HVE-9A PB	1797		
		2HVE-9B PB	1799		
		FCV-25-29 PB	0449		
		FCV-25-30 PB	0452		
		FCV-25-31 PB	0454		
		FCV-25-32 PB	0456		
		FCV-25-33 PB	0458		
		FCV-25-34 PB	0460		
Gould	B/M C9-4B	FCV-25-3301 SS	0473		
		FCV-3306 SS	0475		

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Starters	Gould-Brown Boveri	BY FIELD	MV-08-14 STR	1033	Listed as qualified, but all items are outstanding and the test report has not been reviewed.
			MV-08-15 STR	1036	
			MV-08-19A STR	1044	
			MV-08-19B STR	1046	
Terminal Blocks	Amerace Corporation	616822 (Series)	Qualified Terminal Blocks	0145	The aging Dem. Qualif. Documentation is not listed in? CES. Notes 1 and 5.
Neutron Detector ^b	CE	--	B2069	0152	Qualification has not been evaluated. Used only for R _x trip and is not required to subsequent to a harsh environment. What is the specified time the equipment is required to operate? What aging has been performed? Notes 1, 3, and 8.
			B2071	0153	
			B2075	0154	
			B2077	0155	
			B2078	0156	
			B2079	0157	
			B2349	0166	
B2351	0167				
Pump Motor	Westinghouse	3840787	CHGG P2A	0180	Was aging performed on CHGG pumps? Notes 1, 3, 4, 5, and 8.
			CHGG P2B	0182	
			CHGG P2C	0184	
	Westinghouse	5010P39VSWF	LPS1 P2A	0865	
			LPS1 P2B	0867	
Fan Motor	Reliance	1XF882438A3-NE	2HVS-1A	1800	Notes 1, 3, 5, 7, and 8.
			2HVS-1B	1801	
			2HVS-1C	1802	
			2HVS-1D	1803	
Pump Motor	GE	5K811043C16	AUX FWP 2A	0092	Temperature and pressurizer qual. are outstanding and require reanalysis but the motor is listed as qualified. Notes 1, 3, 5, and 7.
			AUX FWP 2B	0094	
Pump Motor	Siemens-Allis	EL85117-90301-1	CSP 2B	0344	Notes 1, 5 and 8.
Damper Operators	ITT General Controls	NH-90 Series/ NH-95	D-13	0351	Notes 1, 3, 5, and 8. "Life Extension Analysis" is required for operator components so that a maintenance schedule can be determined.
			D-14	0352	
			D-15	0353	
			D-16	0354	
			D-2	0359	
			D-23	0363	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
			D-24	0364	
			D-3	0366	
			D-5A	0377	
			D-5B	0378	
			D-6A	0379	
			D-6B	0380	
			D-8A	0383	
			D-8B	0384	
			D-9A	0385	
			D-9B	0386	
Flow Transmitter ^b	ITT BARTON	764	FT-1158	0641	Notes 1, 3, 5, 7, and 8.
			FT-1168	0642	
			FT-1178	0643	
			FT-1188	0644	
Level Transmitter ^b	ITT BARTON	764	LT-1104	0908	Notes 1, 3, 5, 7, and 8.
			LT-1105	0909	
			LT-1110X	0910	
			LT-1110Y	0911	
			LT-9013A	0913	
			LT-9013B	0914	
			LT-9013C	0915	
			LT-9013D	0916	
			LT-9023A	0917	
			LT-9023B	0918	
			LT-9023C	0919	
			LT-9023D	0920	
			LT-9113	0921	
			LT-9123	0922	
Pressure Transmitter ^b	ITT BARTON	763	PT-8113	1347	PT-8023C is below flood level. The specific qualification documentation is not given in CES.
			PT-8123	1348	
			PT-1102	1318	Notes 1, 3, 5, 7, and 8.
			PT-1102B	1319	
			PT-1102C	1320	
			PT-1102D	1321	
			PT-1103	1322	
			PT-1104	1323	
			PT-1105	1324	
			PT-1106	1325	
			PT-1107	1326	
			PT-1108	1327	
			PT-8013A	1339	
			PT-8013B	1340	
			PT-8013C	1341	
			PT-8013D	1342	
			PT-8023A	1343	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Differential pressure Transmitter ^b	ITT BARTON	764	PT-8023B	1344	Notes 1, 3, 5, 7, and 8.
			PT-8023C	1345	
			PT-8023D	1346	
			PDT-1111A	1145	
			PDT-1111B	1146	
			PDT-1111C	1147	
			PDT-1111D	1148	
			PDT-1121A	1149	
			PDT-1121B	1150	
			PDT-1121C	1151	
PDT-1121D	1152				
Pressure Switch	ITT BARTON	580-1	PS-08-12A	1285	Accuracy has not been demonstrated. Notes 1, 3, 5, 7, and 8.
			PS-08-12B	1286	
			PS-08-6	1287	
			PS-12-17A	1289	
			PS-12-17B	1290	
			PS-12-17C	1291	
			PS-25-12A	1302	
			PS-25-12B	1305	
Pressure Transmitter	Rosemount	11530B5	PT-07-2A	1306	CES states the transmitters need to be relocated. Notes 1, 2, 3, 5, and 8.
			PT-07-2B	1307	
			PT-07-2C	1308	
			PT-07-2D	1309	
Valve Operator	Limitorque	SMB-000-2HIBC	HCV-3512	0760	Operability time may not be enveloped on some operators. Thermal lag analysis is required on some operators. Notes 1, 7 and 8.
			HCV-3635	0770	
	Limitorque	SMB-00-10	HCV-3636	0771	
			HCV-3637	0772	
			HCV-3646	0775	
	Limitorque	3A3272	HCV-3647	0776	
			HCV-3657	0778	
	Limitorque	SMB-1	HCV-3615	0788	
			HCV-3617	0790	
	Limitorque	SMB-L	HCV-3625	0791	
HCV-3626			0792		
Limitorque	SMB-00-10	HCV-3627	0793		

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
	Limitorque	2-2,049	HCV-3645	0797	
	Limitorque	L0-SMB-000-10	MV-07-2A MV-07-2B	1019 1021	
	Limitorque	AK021	MV-08-1A	1023	
	Limitorque	P	MV-08-1B	1025	
	Limitorque	L0-SMB-000	MV-08-12 MV-08-13	1027 1029	
	Limitorque	L0-SMB-4-200	MV-09-10 MV-09-11 MV-09-12	1049 1051 1053	
	Limitorque	L0-SMC-04	MV-09-13 MV-09-14	1055 1057	
Valve Operator	Limitorque	L0-SMB-4-200	MV-09-9	1060	
	Limitorque	L0-SMB-000-2	MV-14-10 MV-14-11 MV-14-12 MV-14-13 MV-14-14 MV-14-15 MV-14-16 MV-14-17 MV-14-18 MV-14-19 MV-14-20 MV-14-9	1064 1066 1068 1070 1072 1074 1076 1078 1080 1082 1086 1092	
Valve Operator	Limitorque	--	V2525	1659	
	Limitorque	SMB-00	V2553	1661	
	Limitorque	SB-00	V2554 V2555	1663 1665	
	Limitorque	SB-0	V3456 V3457	1667 1669	
	Limitorque	SMB-1	V3480 V3481	1671 1673	
	Limitorque	SB-0	V3517	1677	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a	
	Limitorque	SMB-00	V3536	1680		
	Limitorque	SMB-1-40	V3539	1682		
	Limitorque	SMB-1	V3545	1685		
	Limitorque	SMB-2	V3614 V3624 V3634 V3644	1692 1695 1697 1700	CES 1692, 1695, 1697, and 1700 do not state whether the operator are qualified for submergence. The operators are required to operate for 30 minutes following a DBA and could be submerged within 40 minutes.	
Valve Operator	Limitorque	SMB-1	V3651 V3652	1702 1704		
	Limitorque	SB-0	V3654 V3656 V3658	1706 1708 1710		
	Limitorque	SMB-00	V3659 V3660	1712 1714		
	Limitorque	SB-0	V3664 V3665	1716 1718		
Temperature Element	RDF Corporation	Fast Response	TE-1111X	1520		Qualification testing and evaluation have not been completed but equipment is listed as qualified. Notes 1, 3, 4, 5, and 8.
			TE-1111Y	1521		
			TE-1112CA	1522		
			TE-1112CB	1523		
			TE-1112CC	1524		
			TE-1112CD	1525		
			TE-1112HA	1526		
			TE-1112HB	1527		
			TE-1112HC	1528		
			TE-1112HD	1529		
			TE-1115	1530		
			TE-1121X	1531		
			TE-1121Y	1532		
			TE-1122CA	1533		
			TE-1122CB	1534		
			TE-1122CC	1535		
			TE-1122CD	1536		
			TE-1122HA	1537		
			TE-1122HB	1538		
			TE-1122HC	1539		
			TE-1122HD	1540		
			TE-1125	1541		
			TE-3303W	1542		
			TE-3303X	1543		

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
			TE-3303Y	1544	
			TE-3303Z	1545	
			TE-3351X	1546	
			TE-3351Y	1547	
			TE-3352X	1548	
			TE-3352Y	1549	
Electrical Penetrations	Conax Corporation	7310-10002-03	Penet B4	1189	Penetrations have not been qualified for submergence. No submergence test report available. Notes 1, 3, 7, and 8.
			Penet B7	1190	
			Penet C3	1191	
			Penet C7	1192	
			Penet D3	1193	
			Penet E6	1194	
	Conax Corporation	7310-Inst	Penet D8	1959	
			Penet D7	1960	
			Penet E3	1961	
			Penet E1	1962	
			Penet E2	1963	
			Penet E10	1964	
	Conax Corporation	7310-LVP/C	Penet D5	1965	
			Penet PLEP-1	1966	
			Penet ELEP-1	1967	
			Penet C10	1968	
			Penet D6	1969	
	Conax Corporation	7310-Inst.	Penet D9	1970	
			Penet E4	1971	
			Penet E5	1972	
			Penet E7	1973	
	Conax Corporation	7310-Inst.	Penet E8	1974	
			Penet E9	1975	
			Penet A1	1976	
	Conax Corporation	--	Penet A2	1977	
			Penet A3	1978	
			Penet A4	1979	
Penet A6			1980		
Penet A7			1981		
Penet A8			1982		
Penet B1			1983		
Penet B2			1984		
Penet B3			1985		
Penet B5			1986		
Penet B6			1987		
Penet B8			1988		

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Electrical Penetrations			Penet B9	1989	
			Penet C2	1990	
			Penet C3	1991	
			Penet C4	1992	
			Penet C5	1993	
			Penet C6	1994	
			Penet C7	1995	
			Penet C8	1996	
			Penet C9	1997	
			Penet D1	1998	
		Penet D2	1999		
	Conax Corporation	7310-10003-01	Penet D3	2000	
Conductor Modules	Conax Corporation	BY FIELD	CCV-26-1CM	2035	CES 2035 and 2036 describe the same item (tag number CCV-26-1CM).
			CCV-26-1CM	2036	
			CCV-26-3CM	2037	
	Conax Corporation	2/4/C#16	CCV-26-5CM	2038	CES 2094 and 2095 describe the same item (tag number V1464CM).
			FCV-23-6CM	2039	
			FCV-23-4CM	2040	
					Equipment has not been qualified for submergence.
	Conax Corporation	3/4/C#16	FCV-25-3CM	2041	An accelerated aging time of "5 cycles" does not tell how long the equipment was aged.
			FCV-25-4CM	2042	
			FCV-25-20CM	2043	
	Conax Corporation	1/6/C#16	FSE-27-8CM	2044	Notes 1, 3, 4, 7, and 8.
			FSE-27-9CM	2045	
			FSE-27-10CM	2046	
		FSE-27-11CM	2047		
		FSE-27-12CM	2048		
		FSE-27-13CM	2049		
		FSE-27-14CM	2050		
Conax Corporation	3/4/C#16	HCV-14-1CM	2051		
		HCV-14-2CM	2052		
Conax Corporation	2/4/C#16	HCV-3616CM	2053		
		HCV-3628CM	2054		
		HCV-3638CM	2055		
		HCV-3648CM	2056		
		LCV-07-11ACM	2057		
		SE-02-1CM	2058		
		SE-02-2CM	2059		
		SE-02-3CM	2060		
		SE-02-4CM	2061		

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Conductor Modules	Conax Corporation	1/6/C#16	SE-03-1ACM	2062	
			SE-03-1BCM	2063	
			SE-03-1CCM	2064	
			SE-03-1DCM	2065	
			SE-03-2ACM	2066	
			SE-03-2BCM	2067	
			SE-u7-4CM	2068	
	Conax Corporation	1/4/C#16	TE-1112CACM	2069	
			TE-1112CBCM	2070	
			TE-1112CCCM	2071	
			TE-1112CDCM	2072	
			TE-1112HACM	2073	
			TE-1112HBCM	2074	
			TE-1112HCCM	2075	
			TE-1112HDCM	2076	
			TE-1115CM	2077	
			TE-1122CACM	2078	
			TE-1122CBCM	2079	
			TE-1122CCCM	2080	
			TE-1122CDCM	2081	
			TE-1122HACM	2082	
			TE-1122HBCM	2083	
			TE-1122HCCM	2084	
	TE-1122HDCM	2085			
	TE-1125CM	2086			
	Conax Corporation	LATER	TE-07-3ACM	2087	
	Conax Corporation	1/4/C#16	TE-07-3BCM	2088	
TE-07-5BCM			2089		
Conax Corporation	LATER	V1460CM	2090		
		V1461CM	2091		
		V1462CM	2092		
		V1463CM	2093		
		V1464CM	2094		
		V1464CM	2095		
		V1465CM	2096		
		V1466CM	2097		
Conductor Modules	Conax Corporation	2/4/C#16	V2515CM	2098	
			V2516CM	2099	
			V2524CM	2100	
			V3571CM	2101	
			V3572CM	2102	

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
	Conax Corporation	LATER	V5200CM	2103	
	Conax Corporation	2/4/C#16	V5201CM V5202CM V6346CM V6718CM	2104 2105 2106 2107	
	Conax Corporation	LATER	H2 RMB 2ACM	2108	
Cable					
a. Low Voltage power and Control Cable	Kerite	B/M D26 Series	B/M D26 Series	1940	Chemical spray not enveloped.
	Kerite	B/M D54 Series	B/M D54 Series	2006	Qualification for MSLB has not been completed.
	Kerite	B/M D52 Series	B/M D52 Series	2007	What does "Not Acceptable" for replacement and maintenance mean?
	Kerite	B/M D63 Series	B/M D63 Series	2008	Notes 1, 7, and 8.
b. 600 V rated Instr. Cable	Kerite	B/M D62 Series	B/M D62 Series	2009	
c. Thermocouple Ext. Wire	Kerite	B/M D71 Series	B/M D71 Series	2010	
d. Multi-pair Instr. Cable	Kerite	B/M D60 Series	B/M D60 Series	2011	
e. Instrument Cable	Kerite	B/M D61 Series	B/M D61 Series	2012	
Instrument Cable	Rockbestos Company	Firewall III Coaxial	B/M D80 Series	2002	Not qualified. Transients and submergence are not enveloped.
					Notes 1 and 7.
Jumper/Hookup Wire	Teledyne Thermatics	TEFZEL 280	B/M D9 Series	1375	Thermal lag analysis and aging analysis have not been completed.
					Notes 1 and 7.
Splices	Raychem	WCSF-N	WCSF-N Series	1937	Notes 1, 7 and 8.
H2 Analyzer System	Comsip Inc.	K-III/K-IV	H2 ANLR System H2 ANLR LCL CBLSB	1938 1951	Difficult to determine if equipment was tested as a unit.
					Notes 1, 4 and 5.

TABLE A-2. (continued)

Component	Manufacturer	Model	Tag Number	CES Number	Comments ^a
Interlocking Relay	NEHA	4 Box	B2G30	0121	Testing has not been performed but CES states equipment is qualified.
	GE	12HGA111J2	B2G31	0122	
	GE	CR2940	B2G32	0123	Does "PER COMPONENT" for accelerated time and temperature mean that the equipment components will be aged separately? If so, will they be tested as a complete unit?
	GE	ET16			
	GE	EB25			
	AGASTAT	E7012PG			Notes 1, 3, 4.
	AGASTAT	E7012PD			
	TEFZEL	HIGH TEMP WIRING			
	AMP	TERMINALS			
			HCV-09-1ARELPNL	1947	
			HCV-09-1BRELPNL	1948	
			HCV-09-2ARELPNL	1949	
			HCV-09-2BRELPNL	1950	
Electric Heating Coil	WATLOW	1.5/30 kW	EHC-2HVE-6A1	0781	Not qualified. Equipment is under review. Notes 1, 3, 5 and 8.
			EHC-2HVE-6A2	2003	
			EHC-2HVE-6B2	2005	
Level Switch	Magnetrol	A103F-EP	LS-06-1A	0874	Similarity analysis has not been completed. Notes 1 and 7.
			LS-06-1B	0875	

a. See Table A-3 for notes.

b. CE supplied.

TABLE A-3. COMPONENT EVALUATION SHEET NOTES, FIGURE A-1

1. The "QUALIF METHOD" column (5) does not give meaningful information. In almost all cases the method is listed as "COMB. TEST & EXTRAPOL'N" when other methods were possibly used.
2. Outstanding items are listed as none, but some equipment needs to be relocated because of submergence.
3. The entries in the "OTHER EQUIPMENT THIS CES APPLIES TO:" block would be more useful if all pertinent equipment tag numbers were entered.
4. Aging time and temperature are not always listed in the component evaluation sheet (CES). The CES would be more useful if this data were present instead of "SEE TEST REPORT" or "PER COMPONENT."
5. The "REPLACEMENT" and "MAINTAIN" sections should briefly indicate what replacement and maintenance is required to maintain equipment qualification. The comments "SEE TEST REPORT" or "SEE INSTRUCTION MANUAL" do not tell the reviewer anything if he does not have the test report or instruction manual.
6. In many cases the CES indicates SL2 has not checked or verified that the equipment claimed to be qualified is the equipment actually installed.
7. The "ENVIRONMENT" columns (1) and (2) do not always give the highest or most harsh parameters (i.e., highest specified temperature and highest qualified temperature) so that the reviewer could take a cursory look and feel that the environment may be enveloped. In most cases only the normal value and a reference for the design basis accident (DBA) is given. In some cases the referenced curve used for demonstrated qualification is the reference used for specified environment.

TABLE A-3. (continued)

8. The "OUTS ITEMS" column (7) usually does not indicate what parameter is outstanding. If qualification has not been confirmed, the equipment is not qualified and the CES should reflect the outstanding items.
-

A/E: EBASCO SERVICES INC.
 UTILITY: FLORIDA POWER & LIGHT

FACILITY: ST. LUCIE NO. 2
 COMPONENT EVALUATION SHEET

NSSS: COMBUSTION ENG. - PWR
 CAPACITY: 890 MW(E)

REV#-
 CES#-

EQUIPMENT DESCRIPTION	ENVIRONMENT		DOCUMENTATION		QUALIF. METHOD	H/MI	OUTS ITEMS		
	PARAMETER	SPECIFIED	DEM. QUALIF.	SPECIFIED					DEM. QUALIF.
TAG NO :	OPERABIL- ITY				COMB. TEST & EXTRA- POL'N	/	NONE	ACCEL TIME:	
EQUIPMENT: TYPE	NORM/TEST IDBA							ACCEL TEMP:	
COMPONENT;	TEMPERAT- URE				COMB. TEST & EXTRA- POL'N	/	NONE	REPLACEMENT:	
MANUFACTURER:	PRESSURE				COMB. TEST & EXTRA- POL'N	/	NONE	MAINTAIN.:	
MAJOR : SUPPLIER								SUBCOMPONENTS:	
MODEL AND: SERIAL #	RELATIVE HUMIDITY				COMB. TEST & EXTRA- POL'N	/	NONE		
FUNCT. DES: & SERVICE									
ACCUR. SPEC:	CHEMICAL SPRAY				COMB. TEST & EXTRA- POL'N	/	NONE		
ACCUR. DEM.:	R 2 HRI A 30 DI D 1 YRI . 4OYR/RWI				COMB. TEST & EXTRA- POL'N	/	NONE		
SPECIFICATIONS:									
P.O #:	AGE- INST LIFE (PER 323- 1974 DEF.))				COMB. TEST & EXTRA- POL'N	/	NONE	SAFETY FUNCTION:	
PLANT LOC.:									
COORDINATES X- Y- Z-	SUBMERGED YES/NO				COMB. TEST & EXTRA- POL'N	/	NONE	AUTH. REFERENCE:	
INSTALLED (Y/N): INSTAL.									
QUALIF EXEMPTN:	PARA- METER	SUPPL. REVIEW	OTHER EQUIPMENT THIS CES APPLIES TO:				OPERATING REFERENCE:		
*QUALIF:	OPERABILITY		REFERENCES:				IPREP/DATE :		
*STATUS	*TEMPERATURE						ICHECK/DATE:		
*	*PRESSURE						QUALIFICATION REFERENCE		
*	*REL. HUMIDITY						IPREP/DATE :		
*	*ICHEM. SPRAY						ICHECK/DATE:		
PHYS DWG REF:	RADIATION						SYSTEM :		
PHYS DWG LOC:	AGING						TAG :		
MOUNTING :	SUBMERGENCE								
EQ DOC. LOC:	ISAR INV CAT:								
	IOS88 CATEG.:								
	IAPPENDIX E								

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Figure A-1. Component evaluation sheet

APPENDIX B
SUMMARIES OF SL2 CENTRAL FILE REVIEWS

APPENDIX B
SUMMARIES OF SL2 CENTRAL FILE REVIEWS

WESTINGHOUSE ELECTRIC HYDROGEN RECOMBINER,
MODEL B, PLANT IDENTIFICATION NO. 21

The hydrogen recombiners control hydrogen in containment by using heat to cause recombination of liberated hydrogen with free oxygen in the air to form water.

This recombiner is located in the containment at the 62-ft elevation level.

The specified environmental parameters are: temperature, 320°F MSLB, 280°F loss of coolant accident (LOCA); pressure, 42 PSIG; relative humidity, 100%; chemical spray, borated water pH 4.9-7.0; radiation, 1.5×10^7 rads total integrated dose (TID); operability time, 30 days post LOCA.

Reports referenced as qualification documentation include Westinghouse Report WCAP 7709-L and WCAP 9346. Tests of a prototype recombiner were conducted at the following values: temperature, 310°F; pressure, 77 psig; relative humidity, 100%; chemical spray, borated water at pH 10; radiation, 2×10^8 rads; and operability time, greater than 60 days. Aging was done by electrical cycling, with the only thermally degradable component, the power cabling, being qualified by another test report.

It is noted that while the above data shows qualification and the referenced test reports contain sufficient information to qualify the hydrogen recombiners, the correct information was not entered on the component evaluation sheets. Furthermore, discussions with the applicant revealed a lack of understanding of what data was needed for qualification. Errors included the use of energized heater skin temperatures for an enveloping environmental temperature profile, the application of a pressure transient at a different time than the temperature transient, and the referencing of a NRC approval letter without reading the letter or associated Safety Evaluation Report.

It is concluded that the qualification file, as presented, did not support the applicants claim for qualification awaiting confirmatory data.

ANCHOR DARLING HYDRAULIC VALVE ACTUATOR, MODEL NO. 64324-C 0001,
PLANT ID NO. HCV-09-1A

This electrohydraulic control valve actuator operates its associated main feedwater isolation valve. This valve must close rapidly upon receipt of a main steam isolation signal (MSIS) and operate slowly during plant operation. It is located on the steam trestle adjacent to the containment building.

The specified environmental parameters associated with a high energy line break (HELB) are: temperature, 340°F; pressure, 18.5 psia; relative humidity, 100%; radiation, 1×10^5 rads TID; operability time, 1 minute post DBA. No chemical spray or submergence parameters are identified.

The qualification documentation includes Anchor Darling Qualification Report No. QR-4, which includes test reports from other manufacturers. Tests on a prototype actuator were conducted at the following peak values: temperature, 450°F; radiation, 2.5×10^6 rads; humidity, 100%; and operability time, 160 minutes post accident. Margins were adequate for all data submitted. Aging conducted at 250°F for 318 hours was shown to yield a qualified life of greater than 40 years. The 10°C rule supported by Arrhenius methodology was used in these calculations. Accessories for the valve actuator were qualified via individual test reports.

Anomalies noted by the applicant included: lack of any pressure data during the steam test, substitution of a pressure switch different than that tested, and disagreement with manufacturer recommendations concerning replacement schedules. Discrepancies noted by the reviewer include lack of continuity in the qualification file concerning operability time, lack of an action plan concerning qualification data on the proposed pressure switch change, and lack of aging calculations on valve accessories. These discrepancies were satisfactorily addressed by the applicant before the conclusion of the audit.

It is concluded that the Anchor Darling hydraulic valve actuator still needs additional confirmatory data to be qualified; this agrees with the applicant's conclusion.

GENERAL ELECTRIC MOTOR, MODEL NO. 5K811052C57,
PLANT IDENTIFICATION NO. HPSI P-2A

This motor runs HPSI Pump 2A which injects borated water into the reactor coolant system in the event of a system break. It is located in the auxiliary building.

The specified environmental parameters are: temperature, 112°F; relative humidity, 72%; radiation, 3.2×10^5 rads TID; operability time, 180 days post accident. No chemical spray, pressure, or submergence parameters were identified.

The report referenced as evidence of qualification is General Electric Topical Report GEK 50401. This report summarizes data from several sources concerning similar horizontal squirrel cage induction motors. Partial type test data were furnished to substantiate the analysis; however, it should be noted that separate effects testing was employed due to the size of the motor. Radiation materials analysis showed radiation resistance greater than 10^6 rads. Temperature testing of motor components far in excess of the 112°F environmental parameter were also presented. An operability time of greater than 180 days was demonstrated. Thermal aging at 190°C for 28 days and utilization of Arrhenius methodology showed a qualified life in excess of 40 years.

It is concluded that the General Electric motor, Plant ID No. HPSI P-2A, is qualified and that the applicant has adequate documentation in the files to support this conclusion.

CONAX CORPORATION ELECTRICAL PENETRATION,
MODEL NO. 7310-10003-01, PLANT NO. PENET E6

This medium voltage instrumentation penetration provides sealed conductors through containment and is located in the reactor building at coordinates X-635, Y-1467, and Z-24.

The specified accident parameters are: temperature, 420°F; pressure, 44 psig; relative humidity, 100%; chemical spray, 1720-2150 ppm boron and 65 ppm hydrazine, pH 4.9-7.0; radiation, 2.0×10^8 rads TID; submergence, 26 feet; and operability time of 180 days.

Environmental testing has been performed on this model of penetration with the exception of submergence, and is reported in Conax test report IPS-585.2. The organization of the qualification file made it difficult to audit, so the applicant had to walk through the file to show the NRC reviewer the methods used for qualification.

The maximum environmental parameters that the penetration was subjected to are: temperature, >425°F 16 hours; pressure, 62 psig; relative humidity, 100%; chemical spray, 6200 ppm boron and 50 ppm hydrazine, pH 8.7; radiation, 2×10^8 rads TID; operability, 200 hours at >320°F.

Thermal aging was performed for 100 hours at 302°F, providing a pre-aged time of >40 years. Submergence had not been reviewed prior to the audit. The applicant had recently received a submergence test report from Conax, IPS-850, which they will review for submergence qualification. Conax has also agreed to provide the applicant with a revised test report of the penetrations, which will be easier to audit and show qualification.

In conclusion, the electrical penetration Plant No. E6 is qualified for its specified environment with the exception of submergence. Submergence will be reviewed by August 1982 and this information placed into the qualification file.

GENERAL ATOMIC RADIATION DETECTOR, MODEL NO. RD-23,
PLANT ID NO. RD-26-40

This detector is part of the radiation monitoring system (RMS) and provides radiation detection in the reactor building in zone RB17 at coordinate X-755, Y-1502, and Z-90.

The specified accident parameters are: temperature, 420°F; pressure, 44 psig; relative humidity, 100%; chemical spray, 2150 ppm boron and 65 ppm hydrazine, pH 4.9-7.0; radiation, 1.57×10^5 rads TID γ ; and operability time of 180 days.

Environmental testing was performed on a General Atomics Radiation Model RD-23 by Wyle Laboratories and is reported in General Atomic Test Report E-254-960.

The maximum environmental parameters that the RD-23 detector was subjected to are: temperature, 455°F; pressure, 77 psig; relative humidity, 100%; chemical spray, 3000 ppm boron, pH 10.5; radiation, 2×10^8 rads TID for interface materials; and operability time >180 days.

No thermal or radiation aging was performed on the detector because it is made of only inorganic materials that are not radiation or temperature sensitive. The limiting "component" is the interface between the detector and the signal processor (i.e. mating connectors, shrink tubing, and coaxial cabling) and is addressed in other qualification data packages at SL2.

In conclusion, there should be no problems qualifying this detector upon completion of the items identified in the equipment qualification file.

ITT GENERAL CONTROLS DAMPER OPERATOR, MODEL NO. NH-90 SERIES,
PLANT ID NO. D-13

This actuator is part of the ECCS ventilating system and opens dampers on a safety injection actuation signal to allow air to pass thru ECCS filters. It has not been installed, but will be located in the auxiliary building at coordinates X-561, Y-1533, and Z-43.

The specified accident parameters are: temperature, 117°F; pressure, atmospheric; relative humidity, 62%; radiation, 3.5×10^4 rads TID; and operability time of <1 minute.

Environmental testing was performed on an ITT General Controls damper operator, Model NH-91, and is reported in ITT General Controls 721.77.095 and INTEL-RT 5204-001. Documentation was provided in the file showing the Model NH 91 and NH95 operators are similar.

The maximum environmental test parameters that the NH-91 operator was subjected to are: temperature, 200°F; pressure, atmospheric; relative humidity, 100%; radiation, 25×10^6 rads TID; operability, operated to safe position in <1 minute.

Thermal and cyclic aging performed was 3 months at 140°F, 200 hours at 200°F, 2000 cycles at 100% stroke, and 100,000 cycles at 20% stroke. Chemical spray and submergence were not addressed because they are not applicable at this location.

In conclusion, the damper operator, Plant ID No. D13, is qualified for its specified environment, if the proper maintenance is performed. The applicant has agreed to perform "life extension analysis" for operator components. This analysis will be used to show what maintenance and maintenance frequency is required to insure continued operator qualification.

TARGET ROCK SOLENOID VALVE OPERATOR, MODEL NO. 78E-009,
PLANT ID NO. SE-05-1A

This device is used as a system containment isolation sampling valve.

The specified accident parameters are: temperature, 420°F; pressure, 44 psig; humidity, 100%; chemical spray, 1720-2150 ppm boron and 65 ppm hydrazine at pH 4.9-7.0; radiation, 3.6×10^5 rads TID; operability time, 1 minute.

Environmental testing of this item was reported by Target Rock, test report No. 2375 appendices A thru J.

Thermal aging was performed for 33 days at 350°F. The maximum environmental test parameters were: temperature, 385°F; pressure, 66 psig; humidity, 100%; chemical spray, 6200 ppm boron and 50 ppm hydrazine, 8.6-10.0 pH; radiation, 3.53×10^7 rads TID; 14 days test. The qualification method was test and analysis. Not present in the applicants qualification is thermal lag analysis, which the applicant has stated will be completed on 7-31-82.

LIMITORQUE MOTOR OPERATED VALVE ACTUATOR, MODEL AK021,
PLANT ID NO. MV-08-1A

This motor-operated valve actuator operates the main steamline isolation bypass valve A and is located in the turbine building.

The specified accident parameters are: temperature, 333°F; pressure, 16 psig; humidity, 100%; radiation, 1×10^5 rads; and an operability time of 180 days.

Environmental testing for this item was reported by Limitorque Report Nos. B0058, 600456, B0027, B0009, and B0003.

Prior to testing the valve actuator was pre-aged at 165°F for 200 hours. The maximum environmental test parameters were: temperature, 385°F; pressure, 66 psig; humidity, 100%; radiation, 2×10^7 rads TID; and a test duration of 30 days; A qualified life of 40 years was established by test and analysis.

It is concluded that the Limitorque motor-operated valve actuator specified is environmentally qualified with adequate margins, and evidence of qualification is maintained in the applicant's files.

RELIANCE FAN MOTOR, MODEL 1XF882438A3-NE, PLANT ID NO. 2HVS-1A

This device is used for containment heat removal and is located in the reactor building.

The specified accident parameters are: temperature, 420°F; pressure, 44 psig; humidity, 100%; chemical spray, 2150 ppm boron and 65 ppm hydazine pH 4.9-7.0, radiation, 1.57×10^7 rads TID; and operability time 180 days.

Environmental testing for this item was performed by Joy Manufacturing Company as detailed in Report No. X-604 dated April 6, 1977.

Prior to testing thermal aging was performed at 415°F for 108 hours. The maximum environmental test parameters were: temperature, 415°F; pressure, 78 psig; humidity, 100%; chemical spray, 3000 ppm boron-pH 10.5; radiation, 1×10^4 rads; test duration, 1 year. The qualification method was test and analysis.

It is concluded that the documentation presented in the applicants file supports qualification of this item.

AMERANCE CORPORATION TERMINAL BLOCK, MODEL NO. 61682

This device is used as a terminator for control instrumentation wiring in the turbine building and outside containment penetration areas.

The specified accident parameters are: temperature, 333°F for approximately 25 seconds; pressure, 16 psig; humidity, 100%; radiation, 1×10^5 rads TID; operating time, 180 days.

Environmental testing for this item was performed by the Franklin Research Center and is documented in a test report titled Qualification Tests of Terminal and Fuse Blocks F-C5143. Prior to testing the terminal block was pre-aged for 39.6 days at 329°F. The maximum environmental test parameters were: temperature, 340°F for approximately 2-1/2 hours; pressure, 113 psig; humidity, 100%; radiation, 2×10^8 rads; test duration, 7 days. A qualified life of 40 years was established by test and analysis.

It is concluded that the Amerance Terminal Block is environmentally qualified with adequate margins. Evidence of qualification is maintained in the applicant's file.