Volume 3

BROWNS FERRY NUCLEAR PLANT UNITS 1-3

TENNESSEE VALLEY AUTHORITY

RESPONSE TO NRC IE BULLETIN 79-01B

ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT

EWS CLARIFICATION

The following explanation of the use of certain columns in the Evaluation Work Sheets (EWS) applies to those worksheets dealing with original NSSS equipment which was purchased under TVA contract 90744 and 91750.

1. The operating times listed under the "QUALIFICATION" portion of the "ENVIRONMENT" section refer to the actual time duration of the qualification test referenced. They do not imply that the device is not qualified or qualifiable to longer operating times. Specific discussions of actual or postulated operating times can be found in the appendixes.

2. The values given for radiation doses under "QUALIFICATION" either refer to actual type-tested doses or doses determined by a materials consideration. The source of the radiation value is clarified in the appendix.

BROWNS FERRY NUCLEAR PLANT - NEB EVALUATION WORKSHEET INDEX

EWS Number	Description	Manufacturer	Model Number
NEB-1-002	Solenoid operator	Target Rock	1/2SMS-A-01
NEB-1-002A	Solenoid operator	Asco	WPHT8300B68F
NEB-1-003	Diff press indicator sw	Barton	278
NEB-1-005	Solenoid operator	Automatic Valve	C-5497
NEB-1-007	Solenoid operator	Automatic Valve	C-5497
NEB-1-008	Temperature switch	Fenwal	17002-40
NEB-1-012	Motor operator	Limitorque	SMB-000
NEB-1-013	Motor operator	Limitorque	SMB-000
NEB-1-015	Pressure switch	Barksdale	B2T-A12SS
NEB-3-016	Level indicator switch	Yarway	4418C
NEB-3-017	Level indicator switch	Yarway	4418C
NEB-3-018	Pressure switch	Barksdale	B2T-A12SS
NEB-3-019	Level indicator switch	Yarway	4418C
NEB-3-020	Level switch	Yarway	4418CE
NEB-3-021	Pressure switch	Barksdale	B2T-M12SS
NEB-3-021A	Pressure switch	Barton	288
NEB-3-022	Level indicator switch	Yarway	4418C
NEB-3-023	Level indicator switch	Barton	288A
NEB-23-025	Temperature element	Calimatic	158B7061P016
NEB-23-026	Motor operator	Limitorque	SMB-2
NEB-23-027	Temperature element	Calimatic	158B7061P016
NEB-23-028	Flow transmitters	GEMAC	50-555111BDAA3AAA
NEB-23-029	Motor operator	Limitorque	SMB-00
NEB-43-030	Solenoid valve	Asco	WPHTX8300B68F
NEB-43-031	Limit switch	Microswitch	OPD-AR
NEB-43-032	Solenoid valve	Asco	X8300-B61F
NEB-43-033	Limit switch	Microswitch	OPD-AR
NEB-63-035	Temperature element	Fenwal	28-232106-304
NEB-63-037	Pump motors	General Electric	5K326PK-234A
NEB-63-038	Explosive valve	Conax	1823-117
NEB-64-039	Solenoid valve	Asco	WPHTX8300B45F
NEB-64-040	Solenoid valve	Asco	WPHTX8300B45F
NEB-64-041	Limit switch	Namco	D1200G
NEB-64-043	Limit switch	Namco	D1200G
NEB-64-045	Limit switch	Namco	D1200G
NEB-64-046	Pressure switch	Barton	289
NEB-64-047	Solenoid valve	Asco	WPHTX8300B45F
NEB-64-048	Limit switch	Namco	D1200G
NEB-64-049A	Solenoid valve	Asco	HB830081F
NEB-64-050	Limit switch	Namco	D1200G
NEB-64-052	Limit switch	Namco	D1200G
NEB-64-053	Solenoid valve	Asco	WPHTX8300B45F
NEB-64-053A	Solenoid valve	Asco	HB830081F
NEB-64-054	Limit switch	Namco	D1200G
NEB-654-056	Limit switch	Namco	D1200G
NEB-64-056A	Limit switch	Namco	D1200G
NEB-64-058	Pressure transmitter	GEMAC	551032KAAT1
NEB-64-059	Pressure transmitter	GEMAC	551032CAAE1AL1
NEB-64-060	Power supply	General Electric	570012FAAC1
NEB-64-061	Level transmitter	Rosemount	1151
NEB-64-062	Temperature elements	American Standard	158B7079P051
NEB-64-063	Temperature elements	American Standard	158B7079P001
NEB-64-064	Pressure switch	Static-O-Ring	12N/AA4
NEB-64-065	Pressure switch	Static-O-Ring	12N/AA4

BROWNS FERRY NUCLEAR PLANT - NEB EVALUATION WORKSHEET INDEX

NEB-64-066	Pressure switch	Static-O-Ring	B2T-M12SS
NEB-64-067	Level transmitter	Rosemount	1151
NEB-64-068	Pressure transmitter	GEMAC	556110BAAA1
NEB-68-069	Motor operator	Limitorque	SMB-2
NEB-68-070	Motor operator	Limitorque	SMB-3
NEB-68-072A	Pressure switch	Barton	288
NEB-69-073	Motor operator	Limitorque	SMB-0
NEB-69-074	Motor operator	Limitorque	SMB-0
NEB-69-076	Temperature element	Scam	S51-1
NEB-69-077	Temperature element	Scam	S51-1
NEB-69-078	Temperature element	Scam	S51-1
NEB-69-079	Temperature element	Scam	S51-1
NEB-69-080	Temperature element	Scam	S51-1
NEB-69-081	Temperature element	Fenwal	17002-40
NEB-70-082	Motor operator	Limitorque	SMB-00
NEB-71-083	Pressure diff switch	Barton	288
NEB-71-084	Pressure switch	Barksdale	B2T-M12SS
NEB-71-085	Motor operator	Limitorque	SMB-00
NEB-71-089	Temperature switch	Fenwal	17023-6
NEB-71-089A	Temperature switch	Fenwal	17023-6
NEB-71-090	Temperature switch	Fenwal	17023-6
NEB-71-096	Motor operator	Limitorque	SMB-00
NEB-71-097	Pressure transmitter	GEMAC	50-5551032GAAK1
NEB-71-098	Power supply	General Electric	583001AAGK1
NEB-71-100	Motor operator	Limitorque	SMB-0
NEB-71-101	Turbine cont, valve	Terry Turbine	Type GS
NEB-71-102	Turbine cont, valve	Terry Turbine	Type GS
NEB-71-103	Turbine cont, speed cont	Terry Turbine	Type GS
NEB-71-104	Pressure switch	Barksdale	PIH-M85SSV
NEB-71-105	Pressure transmitter	GEMAC	50-551032EAAE1
NEB-71-106	Pressure switch	Mercoid	DA-7043-804
NEB-71-107	Motor operator	Limitorque	SMB-00
NEB-71-108	Motor operator	Limitorque	SMB-00
NEB-71-109	Motor operator	Limitorque	SMB-00
NEB-71-110	Pressure transmitter	GEMAC	50-551032CAAY1
NEB-71-112	Pressure switch	Static-O-Ring	6N-AA21
NEB-71-114	Sq root converter	General Electric	565100AAAC1
NEB-71-115	Flow switch	Barton	289
NEB-71-116	Flow transmitter	GEMAC	50-555111BDAA3AAA
NEB-71-117	Motor operator	Limitorque	SMB-1
NEB-71-118	Motor operator	Limitorque	SMB-1
NEB-71-119	Motor operator	Limitorque	SMB-1
NEB-71-120	Temperature element	Scam	S51-1
NEB-71-121	Temperature element	Scam	S51-1
NEB-71-122	Turb cont, speed element	Terry Turbine	Type GS
NEB-71-123	Turb cont, press switch	Terry Turbine	Type GS
NEB-71-124	Turb cont, temp switch	Terry Turbine	Type GS
NEB-71-125	Turb cont, temp switch	Terry Turbine	Type GS
NEB-71-126	Motor operator	Limitorque	SMB-00
NEB-73-128	Pressure switch	Barksdale	B2T-A12SS
NEB-73-129	Press diff switch	Barton	288A, 289
NEB-73-130	Motor operator	Limitorque	SMB-2
NEB-73-131	Temperature switch	Fenwal	17023-6
NEB-73-132	Temperature switch	Fenwal	17023-6
NEB-73-135	Temperature switch	Fenwal	17023-6

BROWNS FERRY NUCLEAR PLANT - NEB EVALUATION WORKSHEET INDEX

NEB-73-136	Temperature switch	Fenwal	17023-6
NEB-73-141	Temperature switch	Fenwal	17023-6
NEB-73-142	Temperature switch	Fenwal	17023-6
NEB-73-147	Motor operator	Limitorque	SMB-2
NEB-73-148	Turb cont, speed element	Terry Turbine	Type CCS
NEB-73-149	Motor operator	Limitorque	SMB-00
NEB-73-151	Turbine cont, stop vlv	Terry Turbine	Type CCS
NEB-73-154	Turb cont, speed cont	Terry Turbine	Type CCS
NEB-73-155	Turb cont, valve	Terry Turbine	Type CCS
NEB-73-156	Pressure switch	Barksdale	D2H-M150SS
NEB-73-157	Pressure switch	GEMAC	50-551032EAAE1
NEB-73-158	Pressure switch	Mercoid	DA-23-804
NEB-73-160	Motor operator	Limitorque	SMB-0
NEB-73-160A	Motor operator	Limitorque	SMB-0
NEB-73-161	Motor operator	Limitorque	SMB-0
NEB-73-162	Pressure switch	Static-O-Ring	6N-AA-21-V
NEB-73-163	Pressure transmitter	GEMAC	5510326AAK1
NEB-73-164	Flow switch	Barton	289
NEB-73-165	Flow transmitter	GEMAC	555111BDAA3AAA
NEB-73-166	Motor operator	Limitorque	SMB-4T
NEB-73-167	Motor operator	Limitorque	SMB-4T
NEB-73-168	Motor operator	Limitorque	SMB-2
NEB-73-168A	Motor operator	Limitorque	SMB-2
NEB-73-168B	Motor operator	Limitorque	SMB-2
NEB-73-169	Motor operator	Limitorque	SMB-0
NEB-73-170	Motor operator	Limitorque	SMB-4T
NEB-73-171	Turb cont,aux oil pump	Terry Turbine	Type CCS
NEB-73-172	Turb cont, press switch	Terry Turbine	Type CCS
NEB-73-173	Turb cont, temp switch	Terry Turbine	Type CCS
NEB-73-173A	Turb cont, diff pr sw	Terry Turbine	Type CCS
NEB-73-174	Temperature element	Scam	S51-1
NEB-73-175	Temperature element	Scam	S51-1
NEB-73-176	Level switch	Robertshaw	SL-202-A2X
NEB-73-177	HPCI lube oil cooler	Terry Turbine	Type CCS
NEB-74-179	Motor operator	Limitorque	SMB-1
NEB-74-179A	Motor operator	Limitorque	SMB-0
NEB-74-180	Pressure switch	Static-O-Ring	5N-AA3
NEB-74-180A	Pressure switch	Static-O-Ring	5A-AA#
NEB-74-181	Temperature element	Scam	S51-1
NEB-74-184	Pressure switch	Static-O-Ring	5N-AA3 series
NEB-74-184A	Pressure switch	Static-O-Ring	5A-AA3 series
NEB-74-186	Motor operator	Limitorque	SMB-3
NEB-74-187	Motor operator	Limitorque	SMB-2
NEB-74-188	Diff press indicator	Barton	289
NEB-74-189	Flow transmitter	GEMAC	50-555111BDAA3AAA
NEB-74-190	Pressure transmitter	GEMAC	50-551032EAAK1
NEB-74-190A	Flow transmitter	GEMAC	50-555111BDAA3AA
NEB-74-191	Motor operator	Limitorque	SMB-5T
NEB-74-192	Motor operator	Limitorque	SMB-4
NEB-74-193	Motor operator	Limitorque	SMB-2
NEB-74-194	Motor operator	Limitorque	SMB-00
NEB-74-195	Motor operator	Limitorque	SMB-2
NEB-74-196	Motor operator	Limitorque	SMB-2
NEB-74-196A	Motor operator	Limitorque	SMB-2
NEB-74-197	Motor operator	Limitorque	SMB-2

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NEB-74-197A	Motor operator	Limitorque	SMB-2
NEB-74-198	Diff press indicator	Barton	289A
NEB-74-199	Flow transmitter	GEMAC	50-555111BDAA3AAA
NEB-74-200	Pressure transmitter	GEMAC	50-551032EAAK1
NEB-74-202	Motor operator	Limitorque	SMB-4
NEB-74-203	Flow transmitter	GEMAC	50-555111BDAA3AA
NEB-74-204	Motor operator	Limitorque	SMB-2
NEB-74-205	Motor operator	Limitorque	SMB-2
NEB-74-206	Motor operator	Limitorque	SMB-2
NEB-74-207	Motor operator	Limitorque	SMB-00
NEB-74-208	Motor operator	Limitorque	SMB-00
NEB-74-209	Temperature element	Calimatic	158B7061P016
NEB-74-210	Pressure transmitter	GEMAC	5510326AAN1
NEB-74-211	Pump motor	General Electric	5K6348XC23A
NEB-74-212	Pump motor	General Electric	5K6348XC23A
NEB-74-213	Temperature element	Scam	S51-1
NEB-74-213A	Temperature element	Scam	S51-1
NEB-74-213B	Temperature element	Scam	S51-1
NEB-74-213C	Temperature element	Scam	S51-1
NEB-74-213D	Temperature element	Scam	S51-1
NEB-75-214	Motor operator	Limitorque	SMB-0
NEB-75-216	Pressure switch	Mercoid	DA-7043-804
NEB-75-217	Motor operator	Limitorque	SMB-2
NEB-75-219	Flow switch	Barton	289
NEB-75-220	Flow transmitter	GEMAC	50-555111BDAA3AAA
NEB-75-221	Motor operator	Limitorque	SMB-1
NEB-75-222	Motor operator	Limitorque	SMB-2
NEB-75-224	Motor operator	Limitorque	SMB-2
NEB-75-226	Diff press switch	Barton	288
NEB-75-227	Motor operator	Limitorque	SMB-0
NEB-75-229	Pressure switch	Mercoid	DA-7043-804
NEB-75-230	Motor operator	Limitorque	SMB-00
NEb-75-232	Flow switch	Barton	289
NEB-75-233	Flow transmitter	GEMAC	50-555111BDAA3AAA
NEB-75-234	Motor operator	Limitorque	SMB-2
NEB-75-235	Motor operator	Limitorque	SMB-2
NEB-75-237	Motor operator	Limitorque	SMB-2
NEB-75-238	Pump motor	General Electric	5K6336XC198A
NEB-75-238A	Pump motor	General Electric	5K6336XC198A
NEB-76-239	Limit switch	Namco	D1200G
NEB-76-239A	Limit switch	Namco	D1200G
NEB-76-239B	Limit switch	Namco	D1200G
NEB-76-239C	Limit switch	Namco	D1200G
NEB-76-240	Solenoid valve	Asco	X8315
NEB-76-241	Solenoid valve	Asco	X8315C28
NEB-76-242	Solenoid valve	Asco	WPHTX8300B45R
NEB-76-243	H_2 element	General Electric	47E226428G2
NEB-77-244	Level switch	GEMS	XM-36425
NEB-77-249	Solenoid valve	Versa	VSG-3521
NEB-77-249A	Limit switch	Microswitch	BZE6-2RN
NEB-77-249B	Limit switch	Microswitch	BZE6-2RN
NEB-77-250	Level switch	Autocon	M-4
NEB-77-251	Level switch	Autocon	M-4
NEB-77-252	Temperature element	Thermo-Elect	B7582-1
NEB-77-259	Temperature element	Thermo-Elect	B7582-1

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NEB-77-260	Level switch	Autocon	M-5
NEB-77-261	Level switch	Autocon	M-4
NEB-78-262	Level switch	Meletron	9241-6SS10A
NEB-78-265	Level switch	Barksdale	D2H-M18SS
NEB-85-267	Solenoid valve	Asco	HVA86-030
NEB-85-268	Solenoid valve	Asco	HVA90-405
NEB-85-268A	Limit switch	Namco	D1200G
NEB-85-272	Position switch	Microswitch	BZE6-2RN
NEB-85-272	Position switch	Microswitch	BZE6-2RN
NEB-85-274	Solenoid valve	Asco	HVA90-405-2A
NEB-85-276	Level switch	Robertshaw	SL305-E3-X
NEB-90-279	Ion chamber	General Electric	237X731G001
NEB-90-280	Ion chamber	General Electric	237X731G001
NEB-90-281	Ion chamber	General Electric	237X731G001
NEB-90-282	Ion chamber	General Electric	237X731G001
NEB-90-283	Sensor and converter	General Electric	194X927G014
NEB-90-284	Sensor and converter	General Electric	194X927G014
NEB-90-286	Fission product monitor	General Electric	
NEB-90-286A	Fission product monitor	General Electric	
NEB-NM-287	Valve Assembly	General Electric	136B1302G2

E7901B.21

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-1-002
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main steam Plant ID No. See Appx 1 Note 1 Component: Pressure solenoid operator Manufacturer: Target Rock Corp Model No.: 1/2SMS-A-01 Function: Main steam Ln A Accuracy: Req'd: Demon: Category: A,B Service: HPCI logic Bus II cont. Location: 0	Operating Time	1 year	92 hours	(1)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR NEBBFN8013
	Temperature (F)	Figure B.0(1,2,3)	347 F	(4)	See Appx 1 Note 2	Type test	None
	Pressure (PSIA)	Figure B.0(1,2,3)	80	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	γ 3.4×10^7	(4)	See Appx 1 Note 2	See Appx 1 Note 4	See NCR NEBBFN8013
	Aging	N/A		(2)		Appx 1 Note 5	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Malinkow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. This worksheet applies to the following items:

   PSV-1-4, -5, -19, -22, -23, -31, -34, -41, -42 (All MPL #2-71)

2. Target Rock Qualification Test Report No. 2199A.

3. The operating time of one year is a conservative assumption by TVA regarding the possible long term use of the safety relief valves to dump reactor cooling water directly to the suppression chamber should a single failure cause loss of the RHR cooling mode. In actuality, should use of the solenoid to open the SRV for this purpose become necessary, the solenoid would most likely be used only until the single failure could be corrected. In any case, TVA's engineering judgement is that aging-type effects over a one-year period would not significantly affect performance of the solenoid.

4. Valves passed rad dose of 3.4×10^7 in Target Rock test report #2199A. It is still considered feasible that the valves could operate following dose of 2×10^8 rad; however, TVA will commit to further type testing and/or materials analysis of the solenoid valves to ensure qualification of the solenoids. Justification of beta radiation dose tolerance is given by section 4.1.4 of the report.

5. At present the available documentation is insufficient to determine the thermal or radiation aging effects on this equipment; however, in TVA's engineering judgement, aging should not present a problem over the interim period required to determine actual aging effects. TVA will commit, therefore, to perform further type testing or analysis to assess the effects of aging on this equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-1-002A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main Steam Plant ID No. Appendix 1 Note 1 Component: Pressure Solenoid Operator Manufacturer: ASCO Model No.: WPHTX8300B68F Function: Main Steam Line "A" Accuracy: Req'd: Demon: Category: A Service: Steam Location: 0	Operating Time	B 1 year A 30 days	30 days	(1)	See Appx 1 Note 2	See Appx 1 Note 4	None
	Temperature (F)	Figure B.0(1,2,3)	290 F	(4)	"	Type Test	None
	Pressure (PSIA)	Table B.0(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	1.0×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 4	See NCR BFNNEB8031
	Aging	N/A		(2)		Appx 1 Note 4	"
Flood Level Elev:552' Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuska
QA Acceptance: _____

NEB-1-002A, APPENDIX 1, REVISION 0

1. This sheet applies to items PSV-1-18 and -30 (both MPL #2-71).

2. ASCO report number AQ5-21678/TR - This report covered an 8300 series and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

3. The radiation dose of 1×10^6 rad is based upon a materials analysis of the solenoid valve. The diaphragm is composed of Buna-N material which can withstand doses of 1×10^8 rad. Beta dose can be justified by section 4.1.4 of the report.

4. This solenoid valve is required to open for accident mitigation purposes. No credit is taken for closing the valve. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in opening of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in closure of the valve. Not withstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 1-003
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main Steam Plant ID No. Appx,Note 1	Operating Time	1 hour		(1)		Appx 1 Note 2	See NCR BFNNEB8010
Component: Diff Press Indicator Sw Manufacturer: Barton	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
Model No.: 278	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
Function: Main Steam Line "A"	Relative Humidity(%)	100		(4)		"	"
Accuracy: Req'd: See Sect. Demon: 4.1.3 in rpt/	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
Category: A Service: Steam	Radiation (RAD)	$3x10^7$		(4)		Appx 1 Note 2	See NCR BFNNEB8010
Location: 4	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	NA	NA	NA

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnichow
Reviewed by: Charles Tuck
QA Acceptance:

1. This sheet applies to items:

   PDIS-1-13 (A-D) MPL #2-116
   -25 (A-D) MPL #2-117
   -36 (A-D) MPL #2-118
   -50 (A-D) MPL #2-119

2. To date TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   As a result of the worst case HELB, the temperature spike will be at 146° within two minutes. The accident radiation dose for the required operating time is 6×10^{4}. In TVA's engineering judgement, the component will not be adversely affected; therefore, interim operation can be justified. Furthermore, these PDIS's isolate MSIV's on high flow. Sufficient redundancy is provided by the low pressure instrumentation for MSIV's.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-1-005
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main steam Plant ID No. See Appx 1 Note 1 Component: MSIV - solenoid operator assy Manufacturer: Automatic Vlv Corp Model No.: C-5497 Function: Main stm ln Inbd isol Accuracy: Req'd: Demon: Category: A,B Service: Steam Location: 0	Operating Time	A - 1 hr B - 1 yr		(1)		See Appx 1 Note 2	See NCR BFNNEB8018
	Temperature (F)	Figure B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.0(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9		(4)		See Appx 1 Note 2	See NCR BFNNEB8018
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

NEB 1-005, APPENDIX 1, REVISION 0

1. This sheet applies to the following items:

   FSV-1-14, -26, -37, -51 (All A-C) (All MPL #2-80)

2. Based on safety analysis, the solenoid valves must close for accident mitigation. No credit is taken for reopening the valves. Analysis of actual physical configuration of solenoid valves indicates that all postulated solenoid failures would result in closing of the MSIV's; thus these valves will fail-safe. Ultimate failure of all O-rings due to radiation damage could not result in reopening of the valves. Not withstanding this argument, TVA will commit to type testing program or replacement with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-1-007
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main steam Plant ID No. Appx 1 Note 1 Component: MSIV - solenoid operator assy Manufacturer: Automatic Vlv Corp. Model No.: C-5497 Function: Main stm ln Accuracy: NA Req'd: Demon: Category: A,B Service: Steam Location: 7 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	A - 1 day B - 1 year		(1)		See Appx 1 Note 2	See NCR BFNNEB8018
	Temperature (F)	Figure B.7(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)			
	Radiation (RAD)	$2x10^6$		(4)		See Appx 1 Note 2	See NCR BFNNEB8018
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

NEB 1-007, APPENDIX 1, REVISION 0

1. This sheet applies to the following items:

   FSV-1-15, -27, -38, -52 (All A-C) ALL MPL #

2. Based on safety analysis, the solenoid valves must close for accident mitigation. No credit is taken for reopening the valves. Analysis of actual physical configuration of solenoid valves indicates that all postulated solenoid failures would result in closing of the MSIV's; thus these valves will fail-safe. Ultimate failure of all O-rings due to radiation damage could not result in reopening of the valves. Not withstanding this argument, TVA will commit to type testing program or replacement with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-1-008
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main steam Plant ID No. TS-1-17(A-D) MPL #1-121 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17002-40 Function: Heat detection Accuracy: Req'd: Demon: Category: A Service: Main steam Location: 7	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 1	Type test	None
	Temperature (F)	Figure B.7(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^6	1.7×10^5	(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8009
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Fenwal Engineering Report 6350.

2. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis, however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 2×10^8 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-1-012
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main steam Plant ID No. FCV-1-55 MPL # 2-74 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-000 Function: Steam leads Drn inner isol Accuracy: Req'd: N/A Demon: Category: A Service: Steam Location: O	Operating Time	A - 1 hour B - 1 year	24 hours	(1)	See Appx 1 Note 1	Type test	NCR BFNNEB8034
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	Type test.	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$2x10^8$ γ $4x10^9$ β	$2x10^8$ γ	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports# 600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (class B insulation) was successfully tested to 250° for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

   Various aging-related tests have been performed on Limitorque operators (see Note 1 above). In TVA's engineering judgement, this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The effects of beta radiation are insignificant; see section 4.1.4 of report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 1-013
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Main steam Plant ID No. FCV-1-56 MPL # 2-77 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-000 Function: Steam Leads drain Accuracy: Req'd: N/A Demon: Category: A Service: Steam Location: 7 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	A - 1 day B - 1 year	1 day	(1)	See Appx 1 Note 1	Type test	NCR BFNNEB8034
	Temperature (F)	Figure B.7(1) B.7(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$2x10^6$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2 This particular type operator (class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 308°F in two seconds, 225 °F at four seconds, and continues to decrease to 118 at 150 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 3-015
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. PS-3-22(A-D) MPL #2-3-55 Component: Pressure Switch Manufacturer: Barksdale Model No.: B2T-A12SS Function: Intlk Accuracy: Req'd: Demon: Category: A Service: Reactor press A Location: 9	Operating Time	1 day	1 hour	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8011
	Temperature (F)	Figure B.9(1,2,3)	212 F	(4)	"	Generic test	NONE
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD) A B C D	B 2.1×10^7 D 2.3×10^6	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^8 rad.

3. The radiation doses given are based upon a total accident dose plus normal dose. Since this device is required to operate for only one day, the actual dose was calculated to be approximately 8×10^5 rad; therefore, this device should not be adversely affected by radiation over its operating time period.

   Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of one year has been considered and TVA has identified no adverse effects from temperature or any other parameter on the functioning of this device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-016
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. LITS-3-46A,B MPL #2-3-59 Component: Level indicator switch Manufacturer: Yarway Model No.: 4418C Function: Level cont Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Reactor water Location: 9	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8017
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 4	NCR BFNNEB8017
	Relative Humidity(%)	100	98	(4)	"	See Appx 1 Note 5	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	A 2×10^5 B 2.3×10^6	1×10^7	(4)	See Appx 1 NOTE 2	Material analysis	None
	Aging	N/A		(2)		Appx 1 note 3	NCRBFNNEB8017
Flood Level Elev:552' Above Flood Level: Yes N/A No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Lockheed Electronic Company Laboratory test No. 3232-3155, 3/22/73

2. A material anlaysis of the instrument indicates the limiting components to be neoprene dust plugs and cover gaskets and Buna-N O-rings. 79-01B, Table C-1, reports a radiation tolerance of 10^7 rads for neoprene. ORNL, October 1970, reports a radiation tolerance of 1×10^7 rads.

3. Although further evaluation is necessary to determine the qualified operating time, it is TVA's opinion the instruments will adequately meet the operating time requirements.

   A material analysis indicates Buna-N, EPT, neoprene, cork and rubber parts which are subject to some thermal aging; however, this degradation is slow and, in TVA's engineering judgement, this instrument would not be adversely affected by aging considerations.

4. The 0.3 psia difference between the required and tested pressures is considered insignificant, and in TVA's engineering judgement would not adversely affect the proper functioning of the instrument.

5. The 2% difference between the required and tested relative humidities is insignificant, and in TVA's judgement would not adversely affect the proper functioning of the instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-017
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. LIS-3-56(A-D) MPL A,B:2-3-57; C,D:2-3-58 Component: Level indicator switch Manufacturer: Yarway Model No.: 4418C Function: Interlock Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Reactor water level A Location: 9	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8017
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 4	NCR BFNNEB8017
	Relative Humidity(%)	100	98	(4)	"	See Appx 1 Note 5	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.3×10^6	1×10^7	(4)	See Appx 1 Note 2	Material analysis	None
	Aging	N/A		(2)		Appx 1 note 3	NCRBFNNEB801
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Lockheed Electronic Company Laboratory test No. 3232-3155, 3/22/73

2. A material anlaysis of the instrument indicates the limiting components to be neoprene dust plugs and cover gaskets and Buna-N O-rings. 79-01B, Table C-1, reports a radiation tolerance of 10^7 rads for neoprene. ORNL, October 1970, reports a radiation tolerance of 1×10^7 rads.

3. Although further evaluation is necessary to determine the qualified operating time, it is TVA's opinion the instruments will adequately meet the operating time requirements.

   A material analysis indicates Buna-N, EPT, neoprene, cork and rubber parts which are subject to some thermal aging; however, this degradation is slow and, in TVA's engineering judgement, this instrument would not be adversely affected by aging considerations.

4. The 0.3 psia difference between the required and tested pressures is considered insignificant, and in TVA's engineering judgement would not adversely affect the proper functioning of the instrument.

5. The 2% difference between the required and tested relative humidities is insignificant, and in TVA's judgement would not adversely affect the proper functioning of the instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-018
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. PS-3-57(A-D) MPL #2-3-51 Component: Pressure Switch Manufacturer: Barksdale Model No.: B2T-A12SS Function: Intlk Accuracy: Req'd: Demon: Category: A Service: Reactor Press Location: 9 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	1 hour	1 hour	(1)	See Appx 1 Note 1	Generic test	None
	Temperature (F)	Figure B.9(1,2,3)	212 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	A,B 2.1×10^7 C,D 2.3×10^6	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuls
QA Acceptance: _____

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^8 rad.

3. The radiation doses given are based upon a total accident dose plus normal dose. Since this device is required to operate for only 1_4 hour, the actual dose was calculated to be approximately 8×10^4 rad; therefore, this device should not be adversely affected by radiation over its operating time period.

   Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-019
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. LIS-3-58A,C MPL #2-3-72 Component: Level indicator switch Manufacturer: Yarway Model No.: 4418C Function: Interlock Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Reactor water level A Location: 9	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8017
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 4	NCR BFNNEB8017
	Relative Humidity(%)	100	98	(4)	"	See Appx 1 Note 5	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.3×10^6	1×10^7	(4)	See Appx 1 Note 2	Material analysis	None
	Aging	N/A		(2)		Appx 1 note 3	NCRBFNNEB8017
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Lockheed Electronic Company Laboratory test No. 3232-3155, 3/22/73

2. A material anlaysis of the instrument indicates the limiting components to be neoprene dust plugs and cover gaskets and Buna-N O-rings. 79-01B, Table C-1, reports a radiation tolerance of 10^7 rads for neoprene. ORNL, October 1970, reports a radiation tolerance of 1×10^7 rads.

3. Although further evaluation is necessary to determine the qualified operating time, it is TVA's opinion the instruments will adequately meet the operating time requirements.

   A material analysis indicates Buna-N, EPT, neoprene, cork and rubber parts which are subject to some thermal aging; however, this degradation is slow and, in TVA's engineering judgement, this instrument would not be adversely affected by aging considerations.

4. The 0.3 psia difference between the required and tested pressures is considered insignificant, and in TVA's engineering judgement would not adversely affect the proper functioning of the instrument.

5. The 2% difference between the required and tested relative humidities is insignificant, and in TVA's judgement would not adversely affect the proper functioning of the instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-020
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. LITS-3-58B MPL #2-3-79 Component: Level switch Manufacturer: Yarway Model No.: 4418CE Function: Water level check Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Reactor water level A Location: 9	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8017
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 4	NCR BFNNEB8017
	Relative Humidity(%)	100	98	(4)	"	See Appx 1 Note 5	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$2x10^5$	$1x10^6$	(4)	See Appx 1 Note 2	Material analysis	None
	Aging	N/A		(2)		Appx 1 note 3	NCRBFNNEB8017
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Lockheed Electronic Company Laboratory test No. 3232-3155, 3/22/73

2. A material anlaysis of the instrument indicates the limiting components to be neoprene dust plugs and cover gaskets and Buna-N O-rings. 79-01B, Table C-1, reports a radiation tolerance of 10^7 rads for neoprene. ORNL, October 1970, reports a radiation tolerance of 1×10^7 rads.

3. Although further evaluation is necessary to determine the qualified operating time, it is TVA's opinion the instruments will adequately meet the operating time requirements.

   A material analysis indicates Buna-N, EPT, neoprene, cork and rubber parts which are subject to some thermal aging; however, this degradation is slow and, in TVA's engineering judgement, this instrument would not be adversely affected by aging considerations.

4. The 0.3 psia difference between the required and tested pressures is considered insignificant, and in TVA's engineering judgement would not adversely affect the proper functioning of the instrument.

5. The 2% difference between the required and tested relative humidities is insignificant, and in TVA's judgement would not adversely affect the proper functioning of the instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-021
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. PS-3-74A MPL #2-3-52 Component: Pressure Switch Manufacturer: Barksdale Model No.: B2T-M12SS Function: Intlk Accuracy: Req'd: Demon: Category: A Service: Reactor press A Location: 9	Operating Time	1 year	1 hour	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8011
	Temperature (F)	Figure B.9 (1,2,3)	212 F	(4)	"	Generic test	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD) U1 U2&3	5.2×10^5 4.5×10^4	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melikhov
Reviewed by: Charles Tuck
QA Acceptance:

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^8 rad.

   Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of one year has been considered and TVA has identified no adverse effects from temperature or any other parameter on the functioning of this device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 3-021A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater Plant ID No. PS-3-74B MPL # 3-52 Component: Pressure Switch Manufacturer: Barton Model No.: 288 Function: Intlk Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Reactor press A Location: 9	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.2×10^5	3×10^6	(4)	See Appx 1 Note 1	Type test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that operating time of one year will adversely affect the instrument. Similarly, due to the relatively low temperature and radiation levels encountered, aging is not expected to significantly affect this device (based on TVA's engineering judgement).

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-022
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. Appx 1 Note 1 Component: Level indicator switch Manufacturer: Yarway Model No.: 4418C Function: Interlock Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Reactor water level A Location: 9	Operating Time	1 year		(1)	See Appx 1 Note 2	See Appx 1 Note 4	NCR BFNNEB8017
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 5	NCR BFNNEB8017
	Relative Humidity(%)	100	98	(4)	"	See Appx 1 Note 6	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.5×10^5	1×10^6	(4)	See Appx 1 Note 3	Material analysis	None
	Aging	N/A		(2)		Appx 1 note 4	NCRBFNNEB8017
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance:

1. This sheet applies to the following items:

   LIS-3-184, -185 (both MPL #2-3-83)

2. Lockheed Electronic Company Laboratory test No. 3232-3155, 3/22/73

3. A material anlaysis of the instrument indicates the limiting components to be neoprene dust plugs and cover gaskets and Buna-N O-rings. 79-01B, Table C-1, reports a radiation tolerance of 10^7 rads for neoprene. ORNL, October 1970, reports a radiation tolerance of 1×10^7 rads.

4. Although further evaluation is necessary to determine the qualified operating time, it is TVA's opinion the instruments will adequately meet the operating time requirements.

   A material analysis indicates Buna-N, EPT, neoprene, cork and rubber parts which are subject to some thermal aging; however, this degradation is slow and, in TVA's engineering judgement, this instrument would not be adversely affected by aging considerations.

5. The 0.3 psia difference between the required and tested pressures is considered insignificant, and in TVA's engineering judgement would not adversely affect the proper functioning of the instrument.

6. The 2% difference between the required and tested relative humidities is insignificant, and in TVA's judgement would not adversely affect the proper functioning of the instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-3-023
Revision 0.
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor feedwater system Plant ID No. Appx 1 Note 1 Component: Level indicator Switch Manufacturer: Barton Model No.: 288A Function: Water level Accuracy: Required: See Section Demon: 4.1.3 in report Category: A Service: Reactor lvls 3&8 Location: 9 Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 2	See Appx 1 Note 4	NCR BFNNEB8010
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	3×10^6	(4)	See Appx 1 Note 2	Type test	NCR BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 4	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. This sheet applies to items LIS-3-203 (A-D) MPL #2-3-101
   LIS-3-208 (A-D) MPL #2-3-103

2. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

3. The radiation dose of 2.1×10^{7} rad is based upon several conservative assumptions and could be reduced by more accurate specific modeling techniques. In TVA's opinion, such modeling analysis should be able to reduce the actual dose to 3×10^{6} rads or lower.

4. Based on a study of materials used in this device, it is not expected that an operating time of one year would adversely affect the instrument. Similarly, due to the relatively low temperature levels encountered, aging is not expected to significantly affect this device (based on TVA's engineering judgement).

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-23-025
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR Service Water Plant ID No. Appendix 1 Note 1 Component: Temperature Element Manufacturer: Calmatic Model No.: 158B7061P016 Function: RHR HTX A Accuracy: Req'd: Demon: Category: A Service: Water Location: 8	Operating Time	1 year		(1)		Appendix 1 Note 2	NCR BFNNEB8015
	Temperature (F)	Figures B.8(1) B.8(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appendix 1 Note 2	NCR BFNNEB8015
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to items TE-23-32, MPL # 10-95A.
   -38, B.
   -44, C.
   -50, D.

2. To date, qualification information is unavailable for the above items. TVA will continue to pursue, through several sources, the location of the necessary information, and if unsuccessful, commit to type testing or replacement. Continued plant operation is justified based on a limited amount of information available on the calimatic temperature elements; it is not that the devices are of simple construction, typical of most temperature elements used on an industry-wide basis, and would be reasonably expected to withstand environmental extremes.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 23-026
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR service water Plant ID No. Appx 1 Note 4B Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: RHR HTX "A" Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 8 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	1 years	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.8(1) B.8(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.5×10^5	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Terk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

3. This sheet applies to the following:

   FCV 23-34, -40, -46, -52 (MPL #10-89)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-23-027
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR Service Water Plant ID No. Appendix 1 Note 1 Component: Temperature Elements Manufacturer: Calimatic Model No.: 158B7061P016 Function: RHR HTX "A" Accuracy: Req'd: Demon: Category: A Service: Water Location: 8 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		Appendix 1 Note 2	NCR BFNNEB8015
	Temperature (F)	Figure B.8(1) B.8(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appendix 1 Note 2	NCR BFNNEB8015
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance:

1. This sheet applies to items TE-23-35, MPL # 10-94A.
   -41, B.
   -47, C.
   -53, D.

2. To date, qualification information is unavailable for the above items. TVA will continue to pursue, through several sources, the location of the necessary information, and if unsuccessful, commit to type testing or replacement. Continued plant operation is justified based on a limited amount of information available on the calimatic temperature elements; it is not that the devices are of simple construction, typical of most temperature elements used on an industry-wide basis, and would be reasonably expected to withstand environmental extremes.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 23-028
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR service water Plant ID No. Appx 1 Note 2 Component: Flow transmitters Manufacturer: GEMAC (GE) Model No.: 50-555111BDAA3AAA Function: RHR Htx "A" Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Water Location: 8	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.8(1) B.8(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuale
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 23-029
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR service water Plant ID No. FCV-23-57 MPL # 10-169 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Crosstie valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 8	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figures B.8(1) B.8(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
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Sheet No. NEB-43-030
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Sampling & water quality Plant ID No. FSV-43-13 MPL #2-298 Component: Solenoid Valve Manufacturer: Asco Model No.: WPHTX8300B68F Function: Reac Recir INBD isolation Accuracy: Req'd: Demon: Category: A Service: Water Location: O	Operating Time	A 1 hour B 1 year	30 days	(1)	See Aopx 1 Note 1	Appx 1 Note 3	NCR BFNNEB8031
	Temperature (F)	Figure B.0(1,2,3)	290 F	(4)	"	Type Test	None
	Pressure (PSIA)	Figure B.0(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	1×10^6	(4)	See Appx 1 Note 2	Appx 1 Note 3	NCR BFNNEB8031
	Aging	N/A		(2)		Appx 1 Note 3	"
Flood Level Elev: 552' N/A Above Flood Level: Yes 629'4" No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Teske
QA Acceptance: _____

1. ASCO report number AQ5-21678/TR - This report covered an 8300 series and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the solenoid valve. The diaphragm is composed of Buna-N material which can withstand doses of 1×10^6 rad .

3. This solenoid valve is required to open for accident mitigation purposes. No credit is taken for closing the valve. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in opening of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in closure of the valve. Not withstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-43-031
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Sampling and water quality Plant ID No. FCV-43-13 MPL #2-298 Component: Limit switch Manufacturer: Microswitch Model No.: OPD-AR, OPD-AR30 Function: Position Accuracy: Req'd: N/A Demon: Category: A Service: Inboard isolation valve Location: 0	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8006
	Temperature (F)	Figure B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	FIGURE B.0(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β		(4)		See Appx 1 Note 1	NCR BFNNEB8006
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Malinkow
Reviewed by: Charles Tusk
QA Acceptance: _____

1. Micro Switch has a line of standard basic switches which have a wide range of operating characteristics, temperature tolerances, and sealing materials. Their basic switch is comprized of phenolic, beryllium copper, and silver with capabilities of 400° F. Although qualified documentation is not available at this time, it is TVA's engineering judgment, based on past experience, that the switch will perform satisfactorily. TVA will commit to type tests or a replacement program in order to ensure the utilization of qualified components.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-43-032
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Sampling and Water Quality Plant ID No. FSV-43-14 MPL #2-299 Component: Solenoid Valve Manufacturer: ASCO Model No.: X8300-B61F Function: Outbd Isolation Accuracy: Req'd: Demon: Category: A Service: Reactor Recirculation Location: 12	Operating Time	A-1 day B-1 year	30 days	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figure B.12(1) B.12(2,3)	290 F	(4)	"	Type Test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

2. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

3. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-43-033
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Sampling and water quality Plant ID No. FCV-43-14 MPL #2-299 Component: Limit switch Manufacturer: Microswitch Model No.: OPD-AR, OPD-AR30 Function: Position Accuracy: Req'd: N/A Demon: Category: A Service: Outboard isolation valve Location: 0	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8006
	Temperature (F)	Figures B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	Figures B.0(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β		(4)		See Appx 1 Note 1	NCR BFNNEB8006
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

1. Micro Switch has a line of standard basic switches which have a wide range of operating characteristics, temperature tolerances, and sealing materials. Their basic switch is comprized of phenolic, beryllium copper, and silver with capabilities of 400^{0} F. Although qualified documentation is not available at this time, it is TVA's engineering judgment, based on past experience, that the switch will perform satisfactorily. TVA will commit to type tests or a replacement program in order to ensure the utilization of qualified components.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-63-034
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Standby Liquid Control System Plant ID No. TIC-63-2 MPL #11-48 Component: Temperature Switch Manufacturer: Fenwal Model No.: 40-104014-103 Function: Heater controller Accuracy: Req'd: Demon: Category: A Service: SLC Storage Tank Location: 14	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8009
	Temperature (F)	Figure B.1(1,2,3)		(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8009
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Although no specific qualification data was located for this temperature element, it is expected that the device will not be adversely affected by the accident environment. This is based upon TVA's study of the materials used in this instrument. According to available information, the only material used in this device which is possibly susceptible to environment is a neoprene gasket.

   Because neoprene radiation tolerance is at least 10^6 rads, this gasket should see no appreciable effects from the postulated dose of 3.1×10^4 rads. Based on TVA's engineering judgement, the simple nature of construction of the device, plus the relatively low temperature, pressure, and radiation dose, lead to the conclusion that the instrument will perform properly during accident environment. However, TVA will commit to either a type type or replacement of the device with a qualified substitute.

   The effects of aging have been considered on this device, and in TVA's engineering judgement are negligible. Aging will be addressed, however, in the type test or replacement program.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-63-035
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Standby Liquid Control Plant ID No. TE-63-2 MPL #11-49 Component: Temperature Element Manufacturer: Fenwal Model No.: 28-232106-304 Function: Meas. Heater Temp Accuracy: Req'd: Demon: Category: A Service: SLC Storage Tank Location: 14	Operating Time	A-1 day B-1 year		(1)		Appx 1 Note 1	See NCR BFNNEB8009
	Temperature (F)	Figure B.14(1) B.14(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	5	(4)		See App 1 Note 1	See NCR BFNNEB8009
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Although no specific qualification data was located for this temperature element, it is expected that the device will not be adversely affected by the accident environment. This is based upon TVA's study of the materials used in this instrument. According to available information, the only material used in this device which is possibly susceptible to environment is a neoprene gasket.

   Because neoprene radiation tolerance is at least 10^6 rads, this gasket should see no appreciable effects from the postulated dose of 3.1×10^6 rads. Based on TVA's engineering judgement, the simple nature of construction of the device plus the relatively low temperature pressure, and radiation dose, lead to the conclusion that the instrument will perform properly during accident environment. However, TVA will commit to either a type type or replacement of the device with a qualified substitute.

   The effects of aging have been considered on this device, and in TVA's engineering judgement are negligible. Aging will be addressed, however, in the type test or replacement program.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 63-037
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Standby Liquid Control Plant ID No. SLC Pump Mtrs Appx 1, Note 2 Component: Standby Liquid Cntl Pump Mtr Manufacturer: GE Model No.: 5K326PK-234A Function: Pump Mtr Accuracy: Req'd: N/A Demon: Category: A Service: Pump Location: 14 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	30 davs		(1)		Appx 1 Note 1	NCR NCRNEB8034
	Temperature (F)	154 U1 174 U2,3		(4)		"	"
	Pressure (PSIA)	15		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8034
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, qualification information is unavailable for this GE model motor; however, TVA plans to pursue through GE the location of the appropriate information.

   The BFN Emergency Operating Procedure A41, 9/30/80, has given credit to the Standby Liquid Control System as an additional source of high pressure water makeup to the reactor vessel under extreme or unusual conditions. The Standby Liquid Control System may deliver a small quantity of water (approximately 5,000 gallons) to the vessel if, in the most unusual circumstances, other redundant sources of high pressure water makeup fails to function properly. Therefore, it is TVA's opinion that should the failure of this system occur, it is not absolutely relied upon to mitigate the accident.

2. This sheet applies to standby liquid control motors 1A, 1B, 2A, 2B, 3A, 3B, all MPL #11-2.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-63-038
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Standby liquid control Plant ID No. FCV-63-8(A&B) MPL #11-14 Component: Explosive valve Manufacturer: Conax Model No.: 1832-117 Function: Injection valve Accuracy: NA Req'd: Demon: Category: A Service: Standby liquid control Location: 14	Operating Time	30 days	100 days	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figures B.14(1) B.14(2,3)	190 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	2.2×10^4	(4)	See Appx 1 Note 1	See Appx 1 Note 2	None
	Aging	N/A		(2)		Appx 1 note 3	"
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on those sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow

Reviewed by: Charles Tuck

QA Acceptance: _____

1. CONAX test report TR-39 and Wyle summary report QSR-146-A-01

2. The radiation dose of 3.1×10^4 is based upon the 40-year normal dose plus total accident dose for room 14. Since the operating time for the valve would be no greater than 30 days, the actual dose to the valve before use would be no greater than 1×10^4 rad. Therefore the valve is qualified to this radiation dose.

3. Based on the relatively low temperature and radiation doses, aging effects on this defice would be minimal and have no adverse effects on the functioning of this device (in TVA's engineering judgement).

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-039
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. FSV-64-17 MPL #16-19-9 Component: Solenoid Valve Manufacturer: ASCO Model No.: WPHTX8300B45F Function: DW PSC Isolation Valve Accuracy: Req'd: Demon: Category: A Service: FCV-64-17 Control Location: 8	Operating Time	A-1 hour B-1 year	30 days	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figure B.8(1) B.8(2,3)	290 F	(4)	"	Type Test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.9×10^5	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

1. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

2. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

3. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-040
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. See Appx 1 Note 1 Component: Solenoid Valve Manufacturer: ASCO Model No.WPHTX8300B45F Function: DW Air Supply Isolation Valve Accuracy: Req'd: Demon: Category: A Service: FCV-64-18 Control Location: 8	Operating Time	A-1 hour B-1 year	30 days	(1)	See Appx 1 Note 2	See Appx 1 Note 4	None
	Temperature (F)	Figure B.8(1) B.8(2,3)	290 F	(4)	"	Type Test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to the following items:

FSV 64-18	MPL #16-19-8
FSV 64-19	MPL #16-19-10
FSV 64-20	MPL #16-19-11
FSV 64-21	MPL #16-19-11

2. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

3. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

4. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-041
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. FCV-64-18 MPL #16-19-8 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inb isol vlv Accuracy: Req'd: N/A Demon: Category: A Service: Dw atm supp Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-043
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. FCV-64-19 MPL #16-19-10 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inb isol vlv Accuracy: Req'd: N/A Demon: Category: A Service: Supp chamber atm supp Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-045
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. Appx 1 Note 1 Component: Limit Switches Manufacturer: Namco Model No.: D1200G Function: Vacuum relief Accuracy: Req'd: N/A Demon: Category: A Service: Supp chamber Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehulow
Reviewed by: Charles Tuck
QA Acceptance: _____

NEB-64-045, APPENDIX 1, REVISION 0

1. This sheet applies to FCV-64-20 (MPL #16-19-11A) and 64-21 (MPL #16-19-11B)

2. To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90°C (194°F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-046
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. Appx 1 Note 1 Component: Pressure switch Manufacturer: Barton Model No.: 289 Function: ABS press Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Supp chamber Location: 8	Operating Time	A - 1 hour B - 1 year	6 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figures B.8(1) B.8(2,3)	212 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5	3×10^6	(4)	See Appx 1 Note 2	Type test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

NEB-64-046, APPENDIX 1, REVISION 0

1. This sheet applies to PDIS-64-20, -21 (both MPL #-16-19-32)

2. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-029-A-01, E12-3(E12-N010).

3. Based on a study of materials used in this device and TVA's engineering judgement, aging is not considered to adversely affect this device. This is due to the low temperature and radiation

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-047
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. See Appendix 1 Note 1 Component: Solenoid Valve Manufacturer: ASCO Model No.: WPHTX8300B45F Function: DW Exh. Inboard Isol. Valve Accuracy: Req'd: Demon: Category: A Service: FCV-64-29 Control Location: 12	Operating Time	A-1 hour B-1 year	30 days	(1)	See Appx 1 Note 2	See Appx.1 Note 4	None
	Temperature (F)	Figure B.12(1) B.12(2,3)	290	(4)	"	TYPE TEST	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

1. This sheet applies to the following items:

FSV-64-29	MPL #16-19-7A
FSV-64-30	MPL #16-19-4
FSV-64-31	MPL #16-19-6A

2. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

3. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

4. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail-safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No.: NEB- 64-048
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. FCV-64-29 MPL #16-19-7A Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inbd isol valve Accuracy: Req'd: N/A Demon: Category: A Service: DW exhaust Location: 12	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figures B.12(1) B.12(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-49A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. Appendix 1 Note 1 Component: Solenoid Valve Manufacturer: ASCO Model No.: HB830081F Function: DW Exh. Outboard Isolation Valve Accuracy: Req'd: Demon: Category: A Service: FCV-64-30 Control Location: 12	Operating Time	A-1 hour B-1 year	30 days	(1)	See Appx 1 Note 2	See Appx 1 Note 4	None
	Temperature (F)	Figure B.12(1) B.12(2,3)	290 F	(4)	"	Type Test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. This sheet applies to the following items:

FSV-64-30	MPL #16-19-4
FSV-64-29	MPL #16-19-7
FSV-64-31	MPL #16-19-6

2. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

3. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

4. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-050
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. FCV-64-30 MPL #16-19-4 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Outb isol valve Accuracy: Req'd: N/A Demon: Category: A Service: DW exhaust Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.12(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance:

1. To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-052
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. FCV-64-31 MPL #16-19-6A Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inbd isol valve Accuracy: Req'd: N/A Demon: Category: A Service: Standby gas Location: 12	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.12(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-053
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary Containment Plant ID No. See Appendix 1 Note 1 Component: Solenoid Valve Manufacturer: ASCO Model No.: WPHTX8300B45F Function: Supp. Chamber Exh. Inbd. Isol. Valve Accuracy: Req'd: Demon: Category: A Service: FCV-64-32 Cont. Location: 8	Operating Time	A-1 hour B-1 year	30 days	(1)	Appx 1 Note 2	Appx 1 Note 4	See NCR BFNNEB8031
	Temperature (F)	Figure B.8(1) B.8(2,3)	290	(4)	"	Type Test	None
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 4	See NCR BFNNEB8031
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to the following items:

FSV-64-32	MPL #16-19-7B (Units 1 and 2 only)
FSV-64-33	MPL #16-19-4
FSV-64-34	MPL #16-19-6

2. ASCO report No. AQ5-21678/TR - This report covered an 8300 series and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

3. The radiation dose of 1×10^6 rad is based upon a materials analysis of the solenoid valve. The diaphragm is composed of buna-N material which can withstand doses of 1×10^6 rad.

4. This solenoid valve is required to close for accident mitigation purposes. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in closing of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in opening of the valve. Notwithstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-053A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. FSV 64-32 MPL #16-19-7 Component: Solenoid Valve Manufacturer: Asco Model No.: HB830081F Function: Supp chamber EXH. INBD. isol valve Accuracy: Req'd: Demon: Category: A Service: FCV-64-32 cont. Location: 8 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	A - 1 hour B - 1 year	30 days	(1)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8031
	Temperature (F)	Figure B.8(1,2,3)	290 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	1×10^6	(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8031
	Aging	N/A		(2)		Appx 1 Note 3	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Trask
QA Acceptance:

1. ASCO report No. AQ5-21678/TR - This report covered an 8300 series and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the solenoid valve. The diaphragm is composed of buna-N material which can withstand doses of 1×10^6 rad.

3. This solenoid valve is required to close for accident mitigation purposes. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in closing of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in opening of the valve. Notwithstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-054
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. FCV-64-32 MPL #16-19-7B Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inb isol valve Accuracy: Req'd: N/A Demon: Category: A Service: Supp chamb Location: 8	Operating Time	A - 1 hour B - 1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-056
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. FCV-64-33 MPL #16-19-4 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inboard isol valve Accuracy: Req'd: N/A Demon: Category: A Service: Supp cham exhaust Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-056A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: CRD system Plant ID No. FCV-64-34 MPL 16-19-68 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: INB ISOL. VALVE Accuracy: Req'd: N/A Demon: Category: A Service: SUPP CHAM EXHAUST Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-058
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PT-64-50 MPL # 16-19-28 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 552032KAAT1 Function: Detection Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Drywell press Location: 9 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.9(1) B.9(2,3)		(4)			"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)			
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-059
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PT-64-51 MPL # 16-19-36 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 551032CAAE1 Function: Pressure Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Supp chamb Location: 6	Operating Time	A - 1 day B - 1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.6(1) B.6(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-060
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PX-64-51 MPL # 16-19-43 Component: Power supply Manufacturer: General Electric Model No.: 570012FAAC1 Function: Pressure Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Supp chamb Location: 12 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	A - 1 hour B - 1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	FIGURES 8.12 (1) 8.12 (2,3)		(4)		"	"
	Pressure (PSIA)	TABLE 8.1 (1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. GE Power Supplies are well known to be high quality equipment and have performed well throughout the industry in normal plant service. Depending on the results of this continued analysis, TVA will type test or replace this equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-061
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. LT-64-54 MPL #16-19-38 Component: Level transmitter Manufacturer: Rosemount Model No.: 1151 series Function: Supp pool water level Accuracy: Req'd: Demon: Category: A,B Service: Power supply Location: 6	Operating Time	A - 1 hr B - 1 yr	2 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8023
	Temperature (F)	Figure B.6(1,2,3)	300 F	(4)	"	Type testing	None
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^6	(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8023
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehilow
Reviewed by: Charles Funk
QA Acceptance:

1. Rosemount test report 37327B and 127227, revision B (Wyle summary report QSR 048-A-01).

2. The operating time of one hour (category A) is surpassed by the two-hour test duration. The category B operating time of one year requires only that the transmitter not fail in a manner detrimental to plant safety or accident mitigation. TVA's examination of the functioning of this device has not revealed any reasonable probability of such a failure occurring.

   The radiation dose of 3.1×10^{7} is based on the worst case dose at surface of pipes. The transmitter is located several feet from the pipe. It is expected that further analysis and modeling of pipes will reduce the actual dose to the transmitter to the dose at which the transmitter is qualified. Such analyses and modeling programs will be performed to confirm these assumptions. If these assumptions cannot be verified, the instruments will be either type tested or replaced.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-062
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. TE- 64-55A,D,E,F MPL # 16-19-33 Component: Temperature elements Manufacturer: American Standard Model No.: 158B7079P051 Function: Temp indicator Accuracy: Req'd: N/A Demon: Category: A Service: Suppression Pool Location: 6	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8034
	Temperature (F)	Figures B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8016
	Aging	N/A		(2)		Appx 1 Note 1	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Qualification to the specified environmental conditions cannot be documented as this time. However, due to the nature of the materials involved (type 304 SS, copper constrantan, magnesium oxide insulation), it is reasonable to conclude that interim operation is justified. TVA will pursue documented qualification or commit to type testing or replacement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-063
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. TE-64-55(B&C) MPL # 16-19-25 Component: Temperature Elements Manufacturer: American Standard Model No.: 158B7079P001 Function: Temp indicator Accuracy: Req'd: Demon: Category: A Service: Suppression Pool Location: 6	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8016
	Temperature (F)	Figures B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8016
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Qualification to the specified environmental conditions cannot be documented at this time. However, due to the nature of the materials involved (type 304 SS, copper constrantan, magnesium oxide insulation), it is reasonable to conclude that interim operation is justified. TVA will pursue documented qualification or commit to type testing or replacement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-064
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PS-64-56(A-D) MPL # 5-12(A-D) Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 12N/AA4 Function: Half scram Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Drywell press Location:	Operating Time	1 day	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8020
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	A,B 2.1×10^7	1×10^6	(4)	See Appx 1 NOTE 2	See Appx 1 NOTE 3	None
	Aging	C,D 2.3×10^6 N/A		(2)		APPX 1 NOTE 3	NONE
Flood Level Elev: 552' Above Flood Level: Yes N/A No	Submergence	N/A	N/A	(4)	N/A	N/A	None N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Viking lab report 30203-2 (generic component)

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The material in the device which limits the allowable radiation dose are the seals (Buna-N) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^6 rad.

3. The radiation dose specified is based upon a total accident dose plus normal dose. Since this device is required to operate for only one day, the actual dose was calculated to be approximately 8×10^5 rad; therefore, this device should not be adverse affected by radiation over its operating time period.

   Based on the materials evaluation and the temperature and radiation doses encountered by this device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 1 day has been considered, and TVA has identified no adverse effects from temperature (or other parameters) on the functioning of this device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-065
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PS-64-57(A-D) MPL # 10-100 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 12N/AA4 Function: High Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Drywell press Location: 9 Flood Level Elev:552' Above Flood Level: Yes N/A No	Operating Time	30 days	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8020
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	A,C 2.3×10^{7} B,D 2.1×10^{7}	1×10^{6}	(4)	See Appx 1 NOTE 2	See Appx 1 NOTE 3	None
	Aging	N/A		(2)		APPX 1 NOTE 3	
	Submergence	N/A	N/A	(4)	N/A	N/A	None N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Viking lab report 30203-2 (generic component)

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The material in the device which limits the allowable radiation dose are the seals (Buna-N) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^6 rad.

3. The radiation dose specified is based upon a total accident dose plus normal dose. Since this device is required to operate for only 30 days, the actual dose was calculated to be approximately 7×10^6 rad. This dose is based upon several conservative assumptions and could be reduced by more accurate specific modeling techniques. In TVA's opinion, such modeling analysis should be able to reduce the actual dose to below 1×10^6 rads.

   Based on the materials evaluation and the temperature and radiation doses encountered by this device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or other parameters) on the functioning of this device.

   TVA will commit to perform the necessary analysis to model the actual dose levels to this device. Should the results prove inconclusive, TVA will type test the device or replace it with a qualified substitute.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-066
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PS-64-58(A-D) MPL # 10-101(A-D) Component: Pressure switch Manufacturer: Static-O-Ring Model No.: BZT-M12SS Function: High Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: Drywell press Location: 9	Operating Time	30 days	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8020
	Temperature (F)	Figures B.9(1) B.9(2,3)	212 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD) A B	C 2.3×10^6 C 2.1×10^7	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	NCR BFNNEB8020
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Viking lab report 30203-2 (generic component)

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The material in the device which limits the allowable radiation dose are the seals (Buna-N) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^6 rad.

3. The radiation dose specified is based upon a total accident dose plus normal dose. Since this device is required to operate for only 30 days, the actual dose was calculated to be approximately 7×10^6 rad. This dose is based upon several conservative assumptions and could be reduced by more accurate specific modeling techniques. In TVA's opinion, such modeling analysis should be able to reduce the actual dose to below 1×10^6 rads.

   Based on the materials evaluation and the temperature and radiation doses encountered by this device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or other parameters) on the functioning of this device.

   TVA will commit to perform the necessary analysis to model the actual dose levels to this device. Should the results prove inconclusive, TVA will type test the device or replace it with a qualified substitute.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-64-067
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment Plant ID No. LT-64-66 MPL #16-19-24 Component: Level transmitter Manufacturer: Rosemount Model No.: 1151 series Function: Water level indicator Accuracy: Req'd: Demon: Category: A Service: Suppression Chamber water Location: 6	Operating Time	1 year	2 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8023
	Temperature (F)	Figure B.6(1,2,3)	300 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^6	(4)	See Appx 1 Note 1	See App 1 Note 2	See NCR BFNNEB8023
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehrikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. Rosemount test report 37327B and 127227, revision B (Wyle summary report QSR 048-A-01).

2. The radiation dose of 3.1×10^7 rad is based on the worst case dose in the room (surface of RHR pipe). The transmitter is located several feet from the pipe. It is expected that further analysis and modeling of radiation sources (pipes) will reduce the actual dose to the dose at which the transmitter is qualified. Such analyses and modeling programs will be performed to confirm these assumptions.

   Although the test performed was of a 2-hour duration, the oeprating time of one year is not expected to be a problem. The radiation dose over the one-year period (based on the above assumptions) was fully imparted in the test. The effects of pressure over one year should not appreciably differ from the effects during the test period. Temperature effects are also seen to have no appreciable effects upon the functioning of this device.

   Similarly, the aging effects are expected to have little effect on the proper functioning of this equipment. TVA will commit, however, to a program of further analysis or type testing since insufficient documentation is available to make a conclusive judgement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 64-068
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Primary containment system Plant ID No. PT-64-67 MPL # 16-19-23 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 556220BAAA1 Function: Detection Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Drywell press Location: 9	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.9(1) B.9(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.3×10^6		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 68-069
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water recirculating Plant ID No. Appx 1 Note 5 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Recirc pump "A" suction Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 0	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ ~~4×10^9 β~~	2×10^8 γ	(4)	See Appx 1 ~~Note 1~~	See Appx 1 ~~Note 4~~	None
	Aging	N/A		(2)		~~Appx 1 Note 3~~	~~None~~
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement, the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

5. This sheet applies to the following:

   FCV 68-1, -77 (MPL #2-43)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-68-070
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water recirculating Plant ID No.: Appx 1 Note 5 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-3 Function: Recirc pump "A" disch Accuracy: NA Req'd: Demon: Category: A Service: Water Location: 0	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figures B.1(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	TABLE B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	2×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	"
Flood Level Elev: 552' N/A Above Flood Level: Yes x No 584'3"	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. Limitorque test reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). In TVA's engineering judgement, this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

5. This sheet applies to the following:

   FCV-68-3, -79 (MPL #2-53)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-68-72A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor Water Recirc System Plant ID No. PS-68-96 MPL #2-3-52D Component: Pressure Switch Manufacturer: Barton Model No.: 288 Function: Core Spray Accuracy: Req'd: See Section Demon: 4.1.3 in rpt Category: A Service: RHR Interlock Location: 4	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 1	Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figure B.4(1) B.4(2,3)	212 F	(4)	"	Test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Test	None
	Relative Humidity(%)	100	100	(4)	"	Test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	3×10^6	(4)	See Appx 1 Note 1	Appx 1 Note 3	NCRe BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	NA	NA	NA

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that an operating time of one year would create problems with the proper functioning of this device. Similarly, aging is not expected to adversely affect the proper functioning of the instrument; however, the available data is inconclusive.

3. The test for this device does not meet the accident requirements for radiation; however, it is expected, based on further modeling analysis and a materials analysis, that this device could pass a test for radiation. TVA will type test this device to confirm the above or replace it with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-73
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor Water Cleanup Plant ID No. FCV-69-1 MPL # 12-15 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Clean Inner Isolation Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: O	Operating Time	A - 1 hour B - 1 year	24 hours	(1)	See Appx 1 Note 1	Type Test	None
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	"	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	Appendix 1 Note	NCR BFNNEB8034
	Relative Humidity(%)	100	100	(4)	"	Type Test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$2x10^8$ $4x10^9$	$2x10^8$	(4)	See Appx 1 Note 4	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance:

1. Limitorque Test Reports B0003, B-0027, #600198

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accidental environment, in TVA's engineering judgement, the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model oeprator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with class B insulation.

   Effects of beta radiation are insignificant; see section 4.1.4 of report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-74
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. FCV-69-2 MPL #12-18 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Isolation valve Accuracy: Req'd: N/A Demon: Category: A Service: Cleanup outer Location: 11	Operating Time	A - 1 day B - 1 year	1 day	(1)	See Appx 1 Note 1	Type test	NCR BFNNEB8034
	Temperature (F)	Figure B.11(1) B.11(2,3)	250 F	(4)	"	"	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	1.5×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-76
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. TE-69-29A MPL #12-117A Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Temp detector Accuracy: Req'd: See section 4.1.3 Demon: Category: A Service: CU system area Location: 17A	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.9(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	98		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^8		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuttle
QA Acceptance:

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-77
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. TE-69-29B MPL #12-117B Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Temp detector Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: CU system area Location: 17B	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.9(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	98		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^8		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-78
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. TE-69-29C&D MPL #12-117C&D Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Temp detector Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: CU system area Location: 18	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.9(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	98		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	1.7×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-79
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. TE-69-29E,G,H MPL #12-117 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Temp detector Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: CU system area Location: 11	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.11(1,2,3		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	1.5×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-69-80
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. TE-69-29F MPL #12-117F Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Temp detection Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: CU system area Location: 10	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.10(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	1.5×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuite
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 69-81
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor water cleanup Plant ID No. TS-69-29(J-M) MPL 12-83 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17002-40 Function: Temp switch Accuracy: Req'd: Demon: Category: A Service: CU system area 11 Location:	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 1	Type test	None
	Temperature (F)	Figure B.11(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	1.5×10^7	1.7×10^5	(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8009
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. Fenwal engineering report 6350 and Wyle report 43854-1. Also see Wyle summary report QSR-040-A-01.

2. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis; however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 1.5×10^7 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of values encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-70-82
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor Building closed cooling water system Plant ID No. FCV-70-47 MPL #50-87 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Disch hdr outlet vlv Accuracy: NA Req'd: Demon: Category: A Service: RBCCW primary contmt vessel Location: 6	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figures B.6(1) B.6(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type test	None
	Aging	N/A		(2)		Appx 1 note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque test reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-83
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling sys Plant ID No. PDIS-71-1A&B MPL # 13-83,84 Component: Pressure diff indicator switch Manufacturer: Barton Model No.: 288 Function: Excessive Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RCIC steam flow Location: 2	Operating Time	1 hour	6 hours	(1)	See Appx 1 Note 1	Type test	None
	Temperature (F)	Figures B.2(1) B.2(2,3)	212 F	(4)	"	See Appx 1 Note 3	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 1	See Appx 1 Note 2	
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. The radiation dose of 3×10^7 rad is based upon a total accident dose plus normal dose. Since this device is needed for only one hour, the actual dose was calculated to be approximately 6×10^4. Therefore, this device qualifies for radiation dose.

3. A HPCI HELB in compartment #2 is the worst condition this area will see. However, if this does occur, a break in the RCIC line need not be considered. The next worst condition would be an RCIC line break in the torus (area #6). The maximum temperature area #2 will see as a result of the RCIC break is 145° F (unit 1) and 140° F (units 2 and 3). Therefore, the switches will meet the temperature requirements.

4. Based on a study of materials used in this device, it is not expected that aging considerations will adversely affect this equipment (in TVA's engineering judgement). This is based on the low temperature and radiation levels encountered for this instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-84
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling sys Plant ID No. PS-71-1A-D MPL #13-87 Component: Pressure Switch Manufacturer: Barksdale Model No.: B2T-M12SS Function: Low press Accuracy: Req'd: Demon: Category: A Service: RCIC steam press Location: 2	Operating Time	30 days	1 hour	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8011
	Temperature (F)	Figure B.2(1,2,3)	212 F	(4)	"	Generic test	NCR BFNNEB8011
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$1x10^6$	(4)	See Appx 1 Note 2	See Appx 1 Note 3	NCR BFNNEB8011
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1 X 10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1 X 10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1 X 10^6 rad.

The peak temperature due to a HPCI line break in room 1 is 292° F in 30 seconds. The temperature is approximately 200° F in only 80 seconds and continues to decrease thereafter. Due to the rapid temperature increase and decrease, it is highly unlikely that the critical elements of the device would be subjected to a temperature greater than 212°F, which is the temperature to which the device is qualified. Therefore, based on an engineering judgement, this instrument should not be adversely affected by the stated temperature.

3. The radiation doses given are based upon a total accident dose plus normal dose. Since this device is required to operate for only 30 days, the actual dose was calculated to be approximately 7 X 10^6 rad, which represents the dose at the surface of the RHR pipe. Since this instrument is located several feet from the RHR pipe, the actual dose is estimated to be approximately 7 X 10^5 rad; therefore, this instrument should qualify for the stated environment. Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or any other parameter) on the functioning of this device.

TVA will commit to further analysis to confirm the actual radiation dose and temperature effects for this instrument, or type tests will be performed to qualify the device. Should the results prove inconclusive, TVA will replace the device with a qualified substitute.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-85
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-2 MPL #13-15 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: RCIC stm line inbd isol Accuracy: NA Req'd: Demon: Category: A Service: Steam Location: 0	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figures B.1(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	2×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	"
Flood Level Elev: 552' N/A Above Flood Level: Yes x No 586	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque test reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). In TVA's engineering judgement, this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-089
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isol cooling Plant ID No. Appx 1 Note 1 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Leak detection Accuracy: Req'd: Demon: Category: A Service: RCIC Steam line Location: 3 (units 2&3)	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.3(2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$1.7x10^5$	(4)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8009
	Aging	N/A		(2)		"	None
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. This sheet applies to items:

   TS 71-2A MPL-13-79
   TS 71-2B MPL-13-80
   TS 71-2C MPL-13-81
   TS 71-2D MPL-13-82

2. Fenwal Engineering Report 6350 and Wyle report 43854-1.

3. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis, however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 3.1×10^7 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program. Please note that these switches in unit 1 do qualify for radiation.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-89A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core Isol cooling Plant ID No. Appx 1 Note 1B Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Leakage detection Accuracy: Req'd: Demon: Category: A Service: RCIC steam line Location: 1 (unit 1 only)	Operating Time	1 hour	2 hours	(1)	See Appx 1 note 2	Type test	None
	Temperature (F)	Figure B.1(1)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$1.7x10^5$	(4)	See Appx 1 Note 2	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3.	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance:

NEB 71-89A, APPENDIX 1, REVISION 0

1. This sheet applies to items:

   TS 71-2A MPL No. 13-79
   TS 71-2B MPL No. 13-80
   TS-71-2C MPL No. 13-81
   TS-71-2D MPL No. 13-82

2. Fenwal engineering report 6350 and Wyle report 43854-1.

3. Aging - The effects of aging due to the environmental conditions over 40 years are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-90
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isol cooling Plant ID No. See Appx 1 Note 1 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Leak detection Accuracy: Req'd: Demon: Category: A Service: RCIC Steam line Location: 6	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.6(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	1.7×10^5	(4)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8009
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuls
QA Acceptance: _____

1. This sheet applies to items TS-71-2 (E-H, J-N, P, R, S), MPL No. 13-79 through 13-82.

2. Fenwal Engineering Report 6350.

3. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis, however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 3.1×10^7 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-96
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling sys Plant ID No. FCV-71-3 MPL # 13-16B Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Outboard isln Accuracy: Req'd: N/A Demon: Category: A Service: RCIC steam Location: 7	Operating Time	A - 30 days B - 1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.7(1) B.7(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$2x10^6$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 308° F at 2 seconds and is 118°F at 150 seconds It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-97
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. PT-71-48 MPL # 13-68 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 50-551032GAAK1 Function: Steamline press signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RCIC turbine Location: 3	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehihorw
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation; TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-98
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isol cooling system Plant ID No. PX-71-4 MPL # 3-92 Component: Unit power supply Manufacturer: General Electric Model No.: 583001AAGK1 Function: Steam line press Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RCIC turbine Location: 12	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.12(1) B.12(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. GE Power Supplies are well known to be high quality equipment and have performed well throughout the industry in normal plant service. Depending on the results of this continued analysis, TVA will type test or replace this equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-100
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-8 MPL # 13-131 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: RCIC turbine control Accuracy: Req'd: N/A Demon: Category: A Service: Steam supply valve Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehrkow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 297° F at 25 seconds and is 162°F at 120 in unit 1 and 160 F at 120 seconds for units 2 and 3. seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-101
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. TS-71-9 MPL #13-2 Component: Valve Turbine Contl Manufacturer: Terry Turbines Model No.: TYPE GS Function: Water Accuracy: Req'd: N/A Demon: Category: A Service: RCIC Turb Stop Vlv Location: 3	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 71-102
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. FCV-71-10 MPL #13-2 Component: Turbine Controls Manufacturer: Terry Turbines Model No.: Type GS Function: Turbine Control Accuracy Req'd: N/A Demon: Category: A Service: RCIC Sys Location: 3 Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 71-103
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. SC-71-10 MPL #13-2 Component: Turbine Cntls Speed Cntls Manufacturer: Terry Turbines Model No.: Type GS Function: Water Accuracy: Req'd: See Section Demon: 4.1.3 in rpt Category: A Service: RCIC Turb Location: 3	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

NEB-71-103, APPENDIX 1, REVISION 0

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-104
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isol cooling system Plant ID No. Appx 1 Note 1 Component: Pressure Switch Manufacturer: Barksdale Model No.: PIH-M85SSV Function: Rupture disc press Accuracy: Req'd: Demon: Category: A Service: RCIC Turb exhaust Location: 3	Operating Time	30 days	1 hour	(1)	See Appx 1 Note 2	See Appx 1 Note 4	None
	Temperature (F)	Figure B.3(1,2,3)	212 F	(4)	"	Generic test	NCR BFNNEB8011
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$1x10^6$	(4)	See Appx 1 Note 3	See Appx 1 Note 4	NCR BFNNEB8011
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

NEB-71-104, APPENDIX 1, REVISION 0

1. This sheet applies to items PS-71-11(A-D), MPL #13-78, and PS-71-21, MPL #13-67.

2. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

3. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^6 rad.

   The peak temperature due to a HPCI line break in room 3 is 297° F in 30 seconds. The temperature is approximately 200° F in only 80 seconds and continues to decrease thereafter. Due to the rapid temperature increase and decrease, it is highly unlikely that the critical elements of the device would be subjected to a temperature greater than 212°F, which is the temperature to which the device is qualified. Therefore, based on an engineering judgement, this instrument should not be adversely affected by the stated temperature.

4. The radiation doses given are based upon a total accident dose plus normal dose. Since this device is required to operate for only 30 days, the actual dose was calculated to be approximately 7×10^6 rad, which represents the dose at the surface of the RHR pipe. Since this instrument is located several feet from the RHR pipe, the actual dose is estimated to be approximately 7×10^5 rad; therefore, this instrument should qualify for the stated environment. Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or any other parameter) on the functioning of this device.

   TVA will commit to further analysis to confirm the actual radiation dose and temperature effects for this instrument, or type tests will be performed to qualify the device. Should the results prove inconclusive, TVA will replace the device with a qualified substitute.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-105
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. PT-71-12 MPL # 13-70 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 50-551032EAAE1 Function: Exhaust pressure signal Accuracy: Req'd: See Section 4.1.3 in report Demon: Category: A Service: RCIC turbine Location: 3 Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)			
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-106
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. PS-71-13(A-B) MPL #13-72(A&B) Component: Pressure Switch Manufacturer: Mercoid Model No.: DA-7043-804 Function: Exhaust pressure monitor Accuracy: Req'd: Demon: Category: A Service: RCIC turbine Location: 3	Operating Time	30 days		(1)		See Appx 1 Note 1	See NCR BFNNEB8021
	Temperature (F)	Figure B.3(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8021
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

1. To date, qualification information is unavailable. TVA will continue to pursue, through several sources, the location of the necessary information, and if unsuccessful, commit to type testing or replacement. This instrument has adequately functioned in the past, and TVA has no indications that this instrument would not properly function in the near future. In addition, Mercoid instruments are installed at several other nuclear plants with no indications of generic failures.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-107
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-17 MPL # 71-17 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Inbd suction valve Accuracy: Req'd: N/A Demon: Category: A Service: RCIC supp Pool Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 297° F at 25 seconds and is 162°F at 120 in unit 1 and 160°F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-108
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-18 MPL # 13-39 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Outbd suction valve Accuracy: Req'd: N/A Demon: Category: A Service: RCIC supp Pool Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 297° F at 25 seconds and is 162°F at 120 in unit 1 and 160°F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 71-109
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-19 MPL # 71-19 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Suction valve Accuracy: Req'd: N/A Demon: Category: A Service: RCIC cnds tank Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Trusk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 297° F at 25 seconds and is 162°F at 120 in unit 1 and 160°F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 71-110
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. PT-71-20 MPL # 13-65 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 50-551032CAAY1 Function: Suction pressure signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RCIC pump Location: 3	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)			
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-112
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. PS-71-21-1 MPL # 13-67-1 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 6N-AA21 series Function: Suction pressure Monitor Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: RCIC pump low Location: 3	Operating Time	30 days	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8020
	Temperature (F)	Figures B.3(1) B.3(2,3)	212 F	(4)	"	See Appx 1 Note 4	None
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	Generic test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3\ 10^7$	$1x10^6$	(4)	See Appx 1 Note 2	See Appx 1 Note 3	NCR BFNNEB8020
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance:

1. Viking lab report 30203-2 (generic component)

2. The radiation dose of 1 X 10^6 rad is based upon a materials analysis of the pressure switch. The material in the device which limits the allowable radiation dose are the seals (Buna-N) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1 X 10^6 rad.

3. The radiation dose specified is based upon a total accident dose plus normal dose. Since this device is required to operate for only 30 days, the actual dose was calculated to be approximately 7 X 10^6 rad. This dose is based upon several conservative assumptions and could be reduced by more accurate specific modeling techniques. In TVA's opinion, such modeling analysis should be able to reduce the actual dose to below 1 X 10^6 rads.

   Based on the materials evaluation and the temperature and radiation doses encountered by this device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or other parameters) on the functioning of this device.

   TVA will commit to perform the necessary analysis to model the actual dose levels to this device. Should the results prove inconclusive, TVA will type test the device or replace it with a qualified substitute.

4. The Viking report (30203-2) has tested a similar switch to 212° F. The service condition calls for 297° F as a result of RCIC HELB in the compartment, area 3, making the RCIC pump inoperational. Therefore, the pressure switch would not need to function for 297° F, but for 165° F, unit 1, and 154° F, units 2 and 3, as a result of a HPCI HELB. The HPCI break (area 6) would be the next worst condition compartment #3 would see.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-114
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isol cooling system Plant ID No. FM-71-36 MPL # 13-99 Component: Square root converter Manufacturer: General Electric Model No.: 565100AAAC1 Function: Flow Sq Rt Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RCIC system Location: 12	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.12(1) B.12(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. GE Power Supplies are well known to be high quality equipment and have performed well throughout the industry in normal plant service. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment.

The limited information available however does suggest that these devices can probably be qualified to the required environment since that environment is not extremely harsh. For example, the electronic components of this device are known to perform properly after radiation doses of at least 10^4 rads. The required dose of 3×10^4 is a 40-year normal plus 1-year accident doses while the required operating time is only 30 days.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 71-115
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FS-71-36 MPL # 13-57 Component: Flow Switch Manufacturer: Barton Model No.: 289 Function: RCIC flow monitor Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Minimum flow Location: 3	Operating Time	30 days	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 4	NCR BFNNEB8010
	Temperature (F)	Figures B.3(1) B.3(2,3)	212 F	(4)	"	See Appx 1 Note 2	None
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02.

2. As a result of a RCIC HELB in compartment #3, the RCIC pump will be inoperable. Therefore, the next worst condition would be a HPCI HELB in the suppression chamber area #6, a maximum temperature of 165^{0} for unit 1 and 154^{0} for units 2 and 3. These temperatures are well within the qualification data.

3. For a 30-day operating time, the 3×10^{7} accident dose can be lowered to 7×10^{6}.

   These switches are capillary type and will not see the full 7×10^{6} acident contact dose. Further modeling should reduce the dose as a function of distance. Also, HS-71-34A and HS-71-34C can be manually operated from the control room.

   TVA will commit to further modeling analysis to confirm the acceptable radiation dose or replace the device with a qualified substitute.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-116
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FT-71-36 MPL # 13-58	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
Component: Flow transmitter Manufacturer: GEMAC (GE)	Temperature (F)	Figures B.3(1) B.3(2,3)		(4)		"	"
Model No.: 50-555111BDAA3AAA	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
Function: RCIC flow signal	Relative Humidity(%)	100		(4)		"	"
Accuracy: Req'd: See Section Demon: 4.1.3 in report	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
Category: A Service: Flow	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
Location: 3	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of $1x10^4$ per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than $2x10^4$), with an accident dose of only $6x10^4$, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-117
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-37 MPL # 13-20 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-1 Function: Outbd disch valve Accuracy: Req'd: N/A Demon: Category: A Service: RCIC system Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 297° F at 25 seconds and is 162°F at 120 in unit 1 and 160°F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-118
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-38 MPL # 13-30 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-1 Function: Cnds test valve Accuracy: Req'd: N/A Demon: Category: A Service: RCIC system Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tusk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 297° F at 30 seconds and is 162°F at 120 in unit 1 and 160 °F at 120 seconds for units 2 and 3. seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-119
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-39 MPL # 13-21 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-1 Function: Inbd disch valve Accuracy: Req'd: N/A Demon: Category: A Service: RCIC system Location: 3	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 297°F in 25 seconds and is 160°F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

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Facility: Browns Ferry Nuclear Plant
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Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-120
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. TE-71-41A MPL #13-77A Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Leak temp high Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RCIC steam line Location: 3	Operating Time	1 hour		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-121
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. TE-71-41C&D MPL #13-77C&D Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Leak temp high Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RCIC steam line Location: 6	Operating Time	1 hour		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
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Sheet No. NEB- 71-122
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. SE-71-42A&B MPL #13-2 Component: Turbine Cntls Speed Element Manufacturer: Terry Turbines Model No.: Type GS Function: Speed Accuracy: Req'd: See Section 4.1.3 in rpt Demon: Category: A Service: RCIC Turb Location: 3	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-71-123
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. PS-71-44 MPL #13-2 Component: Turbine Cntl Press Switch Manufacturer: Terry Turbines Model No.: Type GS Function: Low Press Monitor Accuracy: Req'd: See Section Demon: 4.1.3 in rpt Category: A Service: RCIC Turb Bearing Oil Location: 3	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

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Facility: Browns Ferry Nuclear Plant
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Sheet No. NEB-71-124
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. TIS-71-45 MPL #13-2 Component: Turbine Control Manufacturer: Terry Turbines Model No.: Type GS Function: RCIC Governor End Accuracy: Req'd: See Section Demon: 4.1.3 in rpt Category: A Service: Bearing High Temp Location: 3	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tenk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 71-125
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core iso. cooling system Plant ID No. TIS-71-46 MPL #13-2 Component: Turbine Cntls Temp Switch Manufacturer: Terry Turbines Model No.: Type GS Function: RCIC Coupl End Accuracy: Req'd: See Section Demon: 4.1.3 in rpt Category: A Service: Bearing Temp High Location: 3	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance:

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The RCIC compartment (area No. 3) will only be exposed to the specified 300° as a result of an RCIC HELB in that compartment. Therefore, the RCIC pump will be inoperable. The next worst environment is caused by a HPCI HELB in area No. 6 resulting in a 146° ambient after 2 minutes in the RCIC compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1
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Sheet No. NEB-71-126
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Reactor core isolation cooling Plant ID No. FCV-71-59 MPL # 14-68 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Vacuum relief Accuracy: Req'd: N/A Demon: Category: A Service: RCIC/HPCI turb exhaust Location: 6	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1) B.6(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuska
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-128
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection sys Plant ID No. PS-73-1(A-D) MPL #23-68 Component: Pressure Switch Manufacturer: Barksdale Model No.: B2T-A12SS Function: Press Accuracy: Req'd: Demon: Category: A Service: HPCI steam supply Location: 2	Operating Time	30 days	1 hour	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figure B.2(1,2,3)	212 F	(4)	"	"	NCR BFNNEB8011
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$1x10^6$	(4)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8011
	Aging	N/A		(2)		Appx 1 Note 3	"
Flood Level Elev: N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^8 rad.

3. The radiation doses given are based upon a total accident dose plus normal dose. Since this device is required to operate for only 30 days, the actual dose was calculated to be approximately 7×10^6 rad, which represents the dose at the surface of the RHR pipe. Since this device is located approximately 5 feet from the pipe, the actual dose is calculated to be 7×10^5 rad; therefore, this device should qualify for the stated environment.

   Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects should not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered and TVA has identified no adverse effects from temperature or any other parameter on the functioning of this device.

   For temperature, the service conditions presently on the worksheets are based on a temperature profile for a HPCI break. PDIS-73-1A and B would detect such a break and isolate the HPCI turbine. Therefore, instruments PS-73-1A, B, C, D, will no longer be needed to monitor the pressure since the HPCI turbine has been isolated and is out of service. The next worse environment would be from a RCIC line break in compartment 6 which could possibly lower the steam pressure to 100 lbs/in^2. Instruments PS-73-1A-D would then be needed to isolate the HPCI turbine to prevent equipment damage when the pressure drops to this level. The temperature profile for unit 1 indicates a maximum temperature of 145° F at 26 seconds. For units 2 and 3, it is 140° F at 27 seconds. The instruments are qualified to these temperatures.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-129
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection system Plant ID No. PDIS-73-1A,B MPL # 23-76,77 Component: Pressure diff indicator switch Manufacturer: Barton Model No.: 288A, 289 Function: Excessive Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: HPCI steam flow Location: 2	Operating Time	1 hour	6 hours	(1)	See Appx 1 Note 1	Type test	None
	Temperature (F)	Figures B.2(1) B.2(2,3)	212 F	(4)	"	See Appx 1 Note 3	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Type Test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 1	See Appx 1 Note 2	
	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuch
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. The radiation dose of 3×10^7 rad is based upon a total accident dose plus normal dose. Since this device is needed for only one hour, the actual dose was calculated to be approximately 6×10^4. Therefore, this device qualifies for radiation dose.

3. A HPCI HELB in compartment #2 is the worst condition this area will see. However, if this does occur, a break in the RCIC line need not be considered. The next worst condition would be an RCIC line break in the torus (area #6). The maximum temperature area #2 will see as a result of the RCIC break is 145° F (unit 1) and 140° F (units 2 and 3). Therefore, the switches will meet the temperature requirements.

4. Based on a study of materials used in this device, it is not expected that aging considerations will adversely affect this equipment (in TVA's engineering judgement). This is based on the low temperature and radiation levels encountered for this instrument.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-130
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-2 MPL # 23-15 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: HPCI stm ln inbd isol Accuracy: Req'd: N/A Demon: Category: A Service: Steam Location:	Operating Time	A - 30 days 24 hours B - 1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β	2×10^8 γ	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' 0 Above Flood Level: Yes N/A No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement, the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-131
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. Appendix 1 Note 1 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Steam leak detector Accuracy: Req'd: Demon: Category: A Service: HPCI logic Bus A cont. Location: 1	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.1(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$1.7x10^5$	(4)	See Appx 1 Note 2	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. This sheet applies to items:

   TS-73-2A MPL No. 23-101
   TS-73-2C MPL No. 23-103

2. Fenwal engineering report 6350 and Wyle report 43854-1.

3. Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-132
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. Appendix 1 Note Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Steam leak detector Accuracy: Req'd: Demon: Category: A Service: HPCI logic Bus II cont. Location: 1	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.1(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	1.7×10^5	(4)	See Appx 1 Note 2	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tusk
QA Acceptance: _____

NEB 73-132, APPENDIX 1, REVISION 0

1. This sheet applies to items:

   TS 73-2B MPL No. 23-102
   TS 73-2D MPL No. 23-104

2. Fenwal engineering report 6350 and Wyle report 43854-1.

3. Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-135
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. Appx 1 Note 1B Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Steam leak detector Accuracy: Req'd: Demon: Category: A Service: HPCI logic Bus A cont. Location: 6	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.6(2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	1.7×10^5	(4)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8009
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)			

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. This sheet applies to items:

   TS 73-2E MPL No. 23-101
   TS 73-2F MPL No. 23-102
   TS 73-2G MPL No. 23-103
   TS 73-2H MPL No. 23-104

2. Fenwal Engineering Report 6350.

3. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis, however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 3.1×10^7 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-~~73-136~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. TS-73-2F MPL #23-102B Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Steam leak detector Accuracy: Req'd: Demon: Category: A Service: HPCI logic Bus II cont. Location: 1	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.1(1)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$1.7x10^5$	(4)	See Appx 1 Note 2	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to items:

   TS-73-2F MPL No. 23-102
   TS-73-2H MPL No. 23-104

2. Fenwal engineering report 6350 and Wyle report 43854-1.

3. Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-141
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. Appx 1 Note 1 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Steam leak detector Accuracy: Req'd: Demon: Category: A Service: HPCI logic bus A cont. Location: 6	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.6(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	1.7×10^5	(4)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8009
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. This sheet aplies to items:

TS-73-2J	MPL No. 23-102
TS-73-2L	"
TS-73-2N	"
TS-73-2R	"

2. Fenwal engineering report 6350 and Wyle report 43854-1.

3. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis, however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 3.1×10^7 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-142
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. Appx 1 Note 1 Component: Temperature Switch Manufacturer: Fenwal Model No.: 17023-6 Function: Steam leak detector Accuracy: Req'd: Demon: Category: A Service: HPCI logic Bus II cont. Location: 6	Operating Time	1 hour	2 hours	(1)	See Appx 1 Note 2	Type test	None
	Temperature (F)	Figure B.6(1,2,3)	305 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	1.7×10^5	(4)	See Appx 1 Note 2	See Appx 1 Note 3	See NCR BFNNEB8009
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to items:

   TS-73-2K MPL 23-102
   TS-73-2M MPL 23-104
   TS-73-1P MPL 23-102
   TS-73-2S MPL 23-104

2. Fenwal Engineering Report 6350 and Wyle report 43854-1.

3. These switches were subjected to a radiation dose of 1.7×10^5 rad without failure. Based on a materials analysis, however, it is expected that the switches could withstand a much greater dose. The only material in these switches that may be subject to significant radiation damage is the "flamenol" insulation. It has been asserted that this material will lose 25 percent of its heat and electrical insulation properties following a dose of 1.3×10^8 rad which is well above the postulated accident dose of 3.1×10^7 rad. TVA's engineering judgement is that these switches will perform satisfactorily under all postulated environmental conditions; however, TVA will commit to either a type testing program to confirm the radiation tolerance of the switches or institute a replacement program.

   Aging - The effects of aging due to the normal environmental conditions are considered negligible based upon a materials analysis. No materials are used in these devices which are known to be susceptible to significant aging (thermal or radiation) degradation over the range of valves encountered.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-147
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-3 MPL # 23-16 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: HPCI steam line Accuracy: Req'd: N/A Demon: Category: A Service: Steam Location: 6	Operating Time	A - 30 days B - 1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1) B.6(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance:

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-148
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. SE-73-5 MPL #23-2 Component: Turbine Cntls Speed Element Manufacturer: Terry Turbines Model No.: Type CCS Function: Control Valve Accuracy: Req'd: See Sect. Demon: 4.1.3 in rpt Category: A Service: HPCI Turb Location: 1 Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)		N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehrikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-~~73-149~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. FCV-73-16 MPL #23-14 Component: Motor Operator Manufacturer: Limitorque Model No.: SMB-2 Function: Steam Supply Valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Turbine Location: 1	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.1(1) B.1(2,3)	250 F	(4)	"	" Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type Test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Teuk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 300°F in 30 seconds after a HELB in compartment 1 and is 231°F in 120 seconds and continues to decrease. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-151
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. FCV-73-18 MPL #23-2 Component: Turbine Stop Valve Manufacturer: Terry Turbines Model No.: Type CCS Function: Stop Valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Turb Location: 1	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, only limited test data is available for this equipment. TVA will pursue through several sources the location of the appropriate documentation or will either commit to type testing or replacement.

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-154
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. SC-73-19 MPL #23-2 Component: Turbine Cntls Speed Cntl Manufacturer: Terry Turbines Model No.: Type CCS Function: Control Valve Accuracy: Req'd: See Sect. Demon: 4.1.3 in rpt Category: A Service: HPCI Turb Location: 1	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-155
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. FCV-73-19 MPL #23-2 Component: Turbine control valve Manufacturer: Terry Turbine Model No.: Type CCS Function: Control valve Accuracy: Req'd: See Section Demon: 4.1.3 of report Category: A Service: HPCI turb Location: 1	Operating Time	30 day		(1)		See Appx 1 Note 1	See NCR BFNNEB-8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$1.7x10^5$	(4)		See Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikoff
Reviewed by: Charles Funk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100 percent RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by a RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (Common Item List, Revision 5, dated September 24, 1980). Their report is expected by November 30, 1980.

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SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-156
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection sys Plant ID No. PS-73-20A-D MPL #23-86 Component: Pressure Switch Manufacturer: Barksdale Model No.: D2H-M150SS Function: Disc ruptured Accuracy: Req'd: Demon: Category: A Service: HPCI turbine exhaust Location: 1	Operating Time	30 days	1 hour	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figure B.1(1,2,3)	212 F	(4)	"	"	NCR NEB BFNNEB8011
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1 X 10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1 X 10^8 rad.

   The peak temperature due to a HPCI line break in room 1 is 292° F in 30 seconds. The temperature is approximately 200° F in only 80 seconds and continues to decrease thereafter. Due to the rapid temperature increase and decrease, it is highly unlikely that the critical elements of the device would be subjected to a temperature greater than 212°F, which is the temperature to which the device is qualified. Therefore, based on an engineering judgement, this instrument should not be adversely affected by the stated temperature.

3. Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or any other parameter) on the functioning of this device.

   TVA will commit to further analysis to confirm the actual temperature effects on this instrument, or type tests will be performed to qualify the device. Should the results prove inconclusive, TVA will replace the device with a qualified substitute.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-157
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection system Plant ID No. PT-73-21 MPL # 23-95 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 50-551032EAAE1 Function: Exhaust press Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: HPCI turbine Location: 2	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.2(1) B.2(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-158
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection sys Plant ID No. PS-73-22(A&B) MPL #23-97(A&B) Component: Pressure Switch Manufacturer: Mercoid Model No.: DA-23-804 Function: Exhaust press high Accuracy: Req'd: Demon: Category: A Service: HPCI turbine Location: 1	Operating Time	30 days		(1)		See Appx 1 Note 1	See NCR BFNNEB8021
	Temperature (F)	Figure B.1(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		See Appx 1 Note 1	See NCR BFNNEB8021
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. To date, qualification information is unavailable. TVA will continue to pursue, through several sources, the location of the necessary information, and if unsuccessful, commit to type testing or replacement. This instrument has adequately functioned in the past, and TVA has no indications that this instrument would not properly function in the near future. In addition, Mercoid instruments are installed at several other nuclear plants with no indications of generic failures.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-160
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-26 MPL # 23-58 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Inbd suction valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Supp Pool Location: 2	Operating Time	A - 30 days B - 1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.2(1) B.2(2,3)	250 F	(4)	"	See Appx Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. Although the peak temperature in units 1 and 3 exceeds the tested condition, the temperature are 174° F for unit 1 and 138° F for unit 3 at 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250°F and, therefore, would not affect the proper functioning of the operator. The Limitorque operator is qualified to the unit 2 temperature profile.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-160A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-26 MPL # 23-58 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Inbd suction valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Supp Pool Location: 5	Operating Time	A - 30 days B - 1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.5(1) B.5(2,3)	250 F	(4)	"	See Appx Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. Although the peak temperature in units 1 and 3 exceeds the tested condition, the temperature are 174° F for unit 1 and 138° F for unit 3 at 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250°F and, therefore, would not affect the proper functioning of the operator. The Limitorque operator is qualified to the unit 2 temperature profile.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-161
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-27 MPL # 23-57 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Suction valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Supp Pool Location: 1	Operating Time	A - 30 days B - 1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.1(1) B.1(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports, B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 300° F in 30 seconds after a HELB in compartment 1 and is 231° F in 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see note 2 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-162
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection system Plant ID No. PS-73-29-1 MPL # 23-85 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 6N-AA-21-V Function: Suction press high Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: HPCI Bstr pump Location: 1	Operating Time	30 days	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8020
	Temperature (F)	Figures B.1(1) B.1(2,3)	212 F	(4)	"	See Appx 1 Note 4	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Generic test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	1×10^6	(4)	See Appx 1 Note 2	Materials and Analysis	None
	Aging	N/A		(2)		"	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Viking lab report 30203-2 (generic component)

2. The radiation dose of 1×10^6 rad is based upon a materials analysis of the pressure switch. The material in the device which limits the allowable radiation dose are the seals (Buna-N) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1×10^6 rad.

   Based on the materials evaluation and the temperature and radiation doses encountered by this device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of 30 days has been considered, and TVA has identified no adverse effects from temperature (or other parameters) on the functioning of this device.

4. The Viking report (30203-2) has tested a similar switch to 212° F. The service condition calls for 297° F as a result of RCIC HELB in the compartment, area 3, making the RCIC pump inoperational. Therefore, the pressure switch would not need to function for 297° F, but for 165° F, unit 1, and 154° F, units 2 and 3, as a result of a HPCI HELB. The HPCI break (area 6) would be the next worst condition compartment #3 would see.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-163
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. PT-73-31 MPL # 23-83 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: -551032GAAK1 Function: Disch press Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: HPCI main pump Location: 1	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 3×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-164
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection system Plant ID No. FS-73-33 MPL # 23-78 Component: Flow Switch Manufacturer: Barton Model No.: 289 Function: Minimum flow Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: HPCI system Location: 1	Operating Time	30 days	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figures B.1(1) B.1(2,3)	212 F	(4)	"	See Appx 1 Note 3	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$3x10^6$	(4)	See Appx 1 Note 1	Type test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that operating time of one year will adversely affect the instrument. Similarly, due to the relatively low temperature and radiation levels encountered, aging is not expected to significantly affect this device (based on TVA's engineering judgement).

3. The HPCI compartment, #1, will only see 300° as a result of a HPCI HELB in that area. Therefore, the HPCI system would be inoperational and making the switch is not required.

   The next worst HELB to affect the HPCI compartment would be a RCIC HELB in the torus area (#6). The maximum temperature would be 106° ; therefore, the 212° qualification will be satisfactory.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-165
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection system Plant ID No. FT-73-33 MPL # 23-82 Component: Flow transmitter Manufacturer: GEMAC (GE) Model No.: 555111BDAA3AAA Function: Flow Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: HPCI sys Location: 1	Operating Time	30 days		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuska
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 3×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will eitner type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-166
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-34 MPL # 23-20 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-4T Function: Outbd disch valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI system Location: 1 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.1(1) B.1(2,3)	250 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance:

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 300°F in 30 seconds after a HELB in compartment 1 and is 231°F in 120 seconds and continues to decrease. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-167
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-35 MPL # 23-21 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-4T Function: Cnds test valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI system Location: 1	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNER8034
	Temperature (F)	Figure B.1(1) B.1(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. The peak temperature is 300° F in 30 seconds after a HELB in compartment 1 and is 231° F in 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-168
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. FCV-73-36 MPL #23-241B Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Test return valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI/RCIC Location: 6 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1)2 B.6(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 2
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-168A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. FCV-73-36 MPL #23-241B	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
Component: Motor operator Manufacturer: Limitorque	Temperature (F)	Figure B.4(1)2 B.4(1,2,3)	250 F	(4)	"	Type test	None
Model No.: SMB-2	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
Function: Test return valve	Relative Humidity(%)	100	100	(4)	"	"	"
Accuracy: Req'd: N/A Demon:	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
Category: A Service: HPCI/RCIC	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
Location: 4	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-168B
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. FCV-73-36 MPL #23-241B Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Test return valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI/RCIC Location: 2	Operating Time	30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.2(1)2 B.2(1,2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-169
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-40 MPL # 23-17 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Suction valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Cnds Tank Location: 1	Operating Time	A - 30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.1(1) B.1(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 300°F in 30 seconds after a HELB in compartment 1 and is 231° F in 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-170
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. FCV-73-44 MPL # 23-19 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-4T Function: Inbd. Disch. Valve Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Supp System Location: 1	Operating Time	A - 30 days	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.1(1) B.1(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$5x10^4$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikoff
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 300°F in 30 seconds after a HELB in compartment 1 and is 231° F in 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-171
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. PS-73-47A MPL #23-2 Component: Aux Oil Pump Mtr Press Sw TB Cntls Manufacturer: Terry Turbines Model No.: Type CCS Function: Initiation Accuracy: Req'd: See Sect. Demon: 4.1.3 in rpt Category: A Service: HPCI Aux Oil Pump Location: 1	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-172
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. PS-73-47B MPI. #23-2 Component: Aux Oil Pump Motor Press Sw TB Cntls Manufacturer: Terry Turbines Model No.: Type CCS Function: Press., Low Accuracy: Req'd: See Sect. Demon: 4.1.3 in rpt. Category: A Service: HPCI Turb Bear. Oil Location: 1	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report..
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 73-173
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. TIS-73-52 MPL #23-2 Component: Turbine Cntls Manufacturer: Terry Turbines Model No.: Type CCS Function: Disch Temp High Accuracy: Req'd: N/A Demon: Category: A Service: HPCI Oil Location: 1 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	30 days		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	NA	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehrikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-173A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: HPCI Plant ID No. PDS-73-53 MPL #23-2 Component: Turbine Cntls Diff Press Sw Manufacturer: Terry Turbines Model No.: Type CCS Function: Disch Temp High Accuracy: Req'd: See Sect. Demon: 4.1.3 in rpt Category: A Service: HPCI Oil Cooler Location: 1	Operating Time	1 year		(1)		Appx 1 Note 1	See NCR BFNNEB8025
	Temperature (F)	Figure B.1(1) B.1(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		Appx 1 Note 1	See NCR BFNNEB8025
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. Qualification information for the specified environmental conditions cannot be documented at this time. However, the BFN FSAR and the Terry Turbine manual specify a 148° ambient and 100% RH. The HPCI compartment (area No. 1) will only be exposed to the specified 300° as a result of a HPCI HELB in that compartment. Therefore, the HPCI pump will be inoperable. The next worst environment is caused by an RCIC HELB in area No. 6 resulting in a 106° ambient in the HPCI compartment. It is TVA's engineering evaluation that interim operation can be justified. However, TVA is committed to pursue further documentation or type testing. Furthermore, qualification of this component is presently being pursued by the BWR Utility Equipment Environmental Qualification Group (common item list, revision 5, dated 9-24-80). Their report is expected by November 30, 1980.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-174
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. See Appx 1 Note 1 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Steam leak detector Accuracy: Req'd: See section 4.1.3 Demon: Category: A Service: HPCI Steam leak detection Location: 1	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.1(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. This sheet applies to the following items:

   TE-73-55A, MPL #23-105A
   TE-73-55B, MPL #23-105A

2. Test data has not been obtained to date; however, the manufacturer rates these resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test these resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-175
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injections Plant ID No. See Appx 1 Note 1 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Steam leak detector Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: HPCI steam leak detection Location: 6	Operating Time	1 day		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. This sheet applies to the following items:

   TE-73-55C, MPL #23-105C
   TE-73-55D, MPL #23-105C

2. Test data has not been obtained to date; however, the manufacturer rates these resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test these resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-73-176
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: High pressure coolant injection Plant ID No. LS-73-57(A&B) MPL #23-91(A&B) Component: Level Switch Manufacturer: Robertshaw Model No.: SL-202-A2X Function: Suppression pool high level Accuracy: Req'd: Demon: Category: A Service: HPCI logic Bus II cont. Location: 6	Operating Time	30 days		(1)		See Appx 1 Note 1	See NCR BFNNEB8004
	Temperature (F)	Figure B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8004
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. To date, test data has not been obtained. Vendor drawings and materials information is expected in the near future; thus analysis of this item will continue. Depending on the results of this analysis, TVA will commit to type testing in order to verify material analysis results or commit to replacement of the equipment.

   Based on limited information available on materials, it is expected that this device could be qualified to the applicable environmental conditions. These high quality swithces have demonstrated good performance in normal plant service for some time and are required to function in the postulated accident environment for a relatively short period.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2 3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-179
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 4 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-1 Function: RHR Pump "A" supp pool Accuracy: Req'd: N/A Demon: Category: A Service: Suction Valve Location: 2	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.2(1) B.2(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2 This particular type operator (class B insulation) was successfully tested to 250° F for 24 hours. Although the peak temperature in unit 1 exceeds the tested condition, the temperature is 174° F at 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging. considerations.

The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. This sheet applies to items:

FCV-74-1, -12, -24, -35 (units 1 and 2) (All MPL #10-13)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: ,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-179A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-35 MPL # 10-13 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: RHR pump "A" supp pool Accuracy Req'd: N/A Demon: Category: A Service: Suction valve Location: 2 Flood Level Elev: N/A Above Flood Level: Yes / No	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.2(1) B.2(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tusk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 292° F at 30 seconds after a HELB in compartment 1 and is 174°F at 120 seconds. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250°F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-180
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 1 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 5N-AA3 series Function: Disch press monitor Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: RHR pump A Location: 2	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 2		NCR BFNNEB8020
	Temperature (F)	Figures B.2(1) B.2(2,3)	212 F	(4)	"	See Appx 1 Note 4	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	Generic test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 5	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to PS-74-8A, MPL # 10-120.
   PS-74-19A, MPL # 10-120.

2. Viking lab report 30203-2 (generic component).

3. The radiation dose of 1×10^6 rads is based upon a materials analysis of the pressure switch. The material in the device limits the allowable radiation dose are the seals (buna N) which according to several studies including the guidelines furnished in bulletin 79-01B are acceptable up to a dose of 1×10^6 rads.

4. Peak temperature conditions of compartment (292^0C) exceeds the Viking lab report 30203-2 (212^0) qualification. This condition would only exist as a result of a HELB in the HPCI compartment.

   These two pressure switches fail temperature conditions because of their location adjacent (area 2) to the HPCI compartment. However, if these two switches fail, area 5 contains pressure switches PS-74-31A and PS-74-42A which in conjunction with the core spray pump switches would provide sufficient redundancy to initiate ADS.

   In TVA's engineering judgment the device could pass a type test designed to confirm that the temperature of the switch would not reach an unacceptable temperature. The switch, due to inertia, is not expected to heat up to unacceptable levels.

5. Radiation: Susceptible materials in the pressure switch will not meet the present radiation dose. The accident condition is 2×10^7, but the material will withstand $1 \times 10^6/7 \times 10^6$. However, the operating time given as 1 year may be reduced. The switches are required for initiation of the ADS. A normal blowdown of the ADS should take $\approx$ 17 minutes, after which time the ADS would not be required. At 24 hours, the radiation dose would be 8×10^5. At 30 days, it would be 7×10^6 which would be within the susceptible materials tolerance.

Notwithstanding these arguments, TVA will either type test or replace with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-180-A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 1 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 5A-AA3 Function: Disch press Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: RHR pump A Location: 2	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 2		NCR BFNNEB8020
	Temperature (F)	Figures B.2(1) B.2(2,3)	212 F	(4)	"	See Appx 1 Note 4	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	Generic test	None
	Relative Humidity(%)	100	100	(4)	"	See Appx 1 Note 5	NCR BFNNEB8020
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.10^7	$1x10^6$	(4)	See Appx 1 Note 3	See Appx 1 Note 6	NCR BFNNEB8020
	Aging	N/A		(2)			"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to PS-74-8B, MPL # 10-123.
   PS-74-19B, MPL # 10-123.

2. Viking lab report 30203-2 (generic component).

3. The radiation dose of 1×10^6 rads is based upon a materials analysis of the pressure switch. The material in the device limits the allowable radiation dose are the seals (buna N) which according to several studies including the guidelines furnished in bulletin 79-01B are acceptable up to a dose of 1×10^6 rads.

4. Accident temperature conditions for compartment #2 (292^0) exceeds the Viking lab report 30203-2 qualification (212^0). This condition would exist as a result of a HELB in the HPCI compartment. The two pressure switches in this area have not been tested to meet the 292^0 in the compartment; however, in TVA's engineering judgment the switch would never reach levels that would adversely affect the device. This is due to the short time device. In TVA's opinion, the switch is qualifiable by type testing. Area 5 has pressure switches PS-74-31B and PS-74-42B for RHR pumps B and D discharge along with core spray pumps, in less harsh areas, that will provide sufficient redundancy to initiate ADS.

5. The Viking report (30203-2) addresses humidity for a static-O-ring model #12N-AA4. Vendor data describes the N as a weathertight housing. The type A housing is an explosionproof plain type. Further evaluation of humidity is needed.

6. No radiation qualification information is available at this time. A material breakdown, from vendor data, identified buna N diaphragm and O rings. This material will not meet the accident condition of 3×10^7 rads (1 year). However, the operating time given as 1 year should be reduced. A normal blowdown of the ADS should last 17 minutes, after which time the ADS would not be required. With an operating time of 24 hours, the radiation dose would be 8×10^5 and for 30 days it would be 7×10^6. This would be within the susceptible materials tolerance.

   The accident dose of 3×10^7 is a worst case. The pumps will not see this radiation level until the condensate tank supply has been depleted and the RHR's are on recirc from the torus. Another consideration is that the 1/4-inch Ø instrument is "dead-ended" and some distance away from the pipe. The instrument tubing is a stagnant leg and should not see the fluid radiation dose of 3×10^7. At 5 feet from the pipe, the radiation dose could be lowered $\approx 7 \times 10^5$ rads. Additional modeling or analysis is required for the piping the area.

Notwithstanding these arguments, TVA will commit to a type testing or replacement program.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-181
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. See Appx 1 Note 1 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Inlet temp measure Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RHR Htx A Location: 8	Operating Time	1 year		(1)		Appx 1 Note 2	NCR BFNNEB8022
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 2	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuttle
QA Acceptance: _____

1. This sheet applies to the following items:

   TE-74-9, -21, -32, -43 (All MPL #10-93)

2. Test data has not been obtained to date; however, the manufacturer rates these resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test these resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-184
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 1 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 5N-AA3 series Function: Disch press monitor Accuracy: Req'd: See section Demon: 4.1.3 of report Category: A Service: RHR pump B Location: 5	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 2		NCR BFNNEB8020
	Temperature (F)	Figures B.5(1) B.5(2,3)	212 F	(4)	"	See appx 1 Note 4	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	Generic test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 5	NCR BNFNEB8020
	Aging	N/A		(2)			"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to PS-74-31A, MPL # 10-120.
   PS-74-42A, MPL # 10-120.

2. Viking lab report 30203-2 (generic component).

3. The radiation dose of 1×10^6 rads is based upon a materials analysis of the pressure switch. The material in the device limits the allowable radiation dose are the seals (buna N) which according to several studies including the guidelines furnished in bulletin 79-01B are acceptable up to a dose of 1×10^6 rads.

4. Peak temperature conditions of compartment (294^0) exceeds the Viking lab report 30203-2 (212^0) qualification. This condition would only exist as a result of a HELB in the HPCI compartment; however, in TVA's engineering judgment, the switch would never reach levels that would adversely affect the device. This is due to the short time at 292^0 F and the thermal inertia of the device. In TVA's opinion, the switch is qualifiable by type testing.

   These two pressure switches fail temperature conditions because of their location adjacent (area 5) to the HPCI compartment. However, if these two switches fail, area 2 contains pressure switches PS-74-8A and PS-74-19A which in conjunction with the core spray pump switches would provide sufficient redundancy to initiate ADS.

5. Susceptible materials in the pressure switch will not meet the present radiation dose. The accident condition is 3×10^7, but the material will withstand $1 \times 10^6/7 \times 10^6$. However, the operating time given as 1 year may be reduced. The switches are required for initiation of the ADS. A normal blowdown of the ADS should take $\approx$ 17 minutes, after which time the ADS would not be required. At 24 hours, the radiation dose would be 8×10^5. At 30 days, it would be 7×10^6 which would be within the susceptible materials tolerance.

Notwithstanding these arguments, TVA will either type test or replace with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-184A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 1 Component: Pressure switch Manufacturer: Static-O-Ring Model No.: 5A-AA3 series Function: Disch press monitor Accuracy: Req'd: See section 4.1.3 of report Demon: Category: A Service: RHR pump B Location: 5	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 2		NCR BFNNEB8020
	Temperature (F)	Figures B.5(1) B.5(2,3)	212 F	(4)	"	See Appx 1 Note 4	"
	Pressure (PSIA)	Table B.1(1,2,3)	25	(4)	"	Generic test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$1x10^6$	(4)	See Appx 1 Note 3	See Appx 1 Note 6	NCR BFNNEB8020
	Aging	N/A		(2)			"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. This sheet applies to PS-74-31B, MPL # 10-123.
   PS-74-42B, MPL # 10-123.

2. Viking lab report 30203-2 (generic component).

3. The radiation dose of 1×10^6 rads is based upon a materials analysis of the pressure switch. The material in the device limits the allowable radiation dose are the seals (buna N) which according to several studies including the guidelines furnished in bulletin 79-01B are acceptable up to a dose of 1×10^6 rads.

4. Accident temperature conditions for compartment #5 (294^o) exceeds the Viking lab report 30203-2 qualification (212^o). This condition would exist as a result of a HELB in the HPCI compartment. The two pressure switches in this area have not been tested to meet the 294^o in the compartment; however, in TVA's engineering judgment the switch would never reach levels that would adversely affect the device. This is due to the short at 292^o F and the thermal inertia of the device. In TVA's opinion, the switch is qualifiable by type testing. Area 2 has pressure switches PS-74-8B and PS-74-19B for RHR pumps A and C discharge along with core spray pumps, in less harsh areas, that will provide sufficient redundancy to initiate ADS.

5. The Viking report (30203-2)addresses humidity for a static-O-ring model #12NAA4. Vendor data describes the N as a weathertight housing. The type A housing is an explosionproof plain type. Further evaluation of humidity is needed.

6. No radiation qualification information is available at this time. A material breakdown, from vendor data, identified buna N diaphragm and O rings. This material will not meet the accident condition of 3×10^7 rads (1 year). However, the operating time given as 1 year should be reduced. A normal blowdown of the ADS should last 17 minutes, after which time the ADS would not be required. With an operating time of 24 hours, the radiation dose would be 8×10^5 and for 30 days it would be 7×10^6. This would be within the susceptible materials tolerance.

   The accident dose of 3×10^7 is a worst case. The pumps will not see this radiation level until the condensate tank supply has been depleted and the RHR's are on recirc from the torus. Another consideration is that the 1/4-inch Ø instrument is "dead-ended" and some distance away from the pipe. The instrument tubing is a stagnant leg and should not see the fluid radiation dose of 3×10^7. At 5 feet from the pipe, the radiation dose could be lowered 7×10^5 rads. Additional modeling or analysis is required for the piping in this area.

Notwithstanding these arguments, TVA will commit to a type testing or replacement program.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-186
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-47 MPL # 10-17 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-3 Function: Outbd valve cont Accuracy: Req'd: N/A Demon: Category: A Service: RHR shut line cooling Location: O	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^8 β	2×10^8 γ	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Mehrihow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement, the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-187
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-48 MPL #10-18 Component: Motor operator Manufacturer: Limitorque Model No.: SMR-2 Function: RHR shutdn cool inbd Accuracy: NA Req'd: Demon: Category: A Service: Water Location: 0	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figures B.1(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	2×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	"
Flood Level Elev: 552' N/A Above Flood Level: Yes x No 579'3"	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance:

1. Limitorque test reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). In TVA's engineering judgement, this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-188
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal system Plant ID No. FIS-74-50 MPL # 10-124 Component: Differential pressure indicator Manufacturer: Barton Model No.: 289 Function: Total flow Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR system I Location: 1	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figures B.1(1) B.1(2,3)	212 F	(4)	"	See Appx 1 Note 3	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5×10^4	3×10^6	(4)	See Appx 1 Note 1	Type test	
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that an operating time of one year would create problems with the proper functioning of this device. Similarly, aging is not expected to adversely affect the proper functioning of this instrument; however, the available data is inconclusive.

3. The type test for this device does not meet the accident requirements; however, it is expected from a materials analysis that the device could pass tests at these temperatures; therefore, TVA will commit to a type testing or replacement program.

   Please note, however, that these switches, which open valves FCV-74-30 and FCV 74-7, can also be operated by handswitches located in the control room.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-189
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FT-74-50 MPL # 10-109 Component: Flow transmitter Manufacturer: GEMAC (GE) Model No.: 50-555111BDAA3AAA Function: flow signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR system I Location: 2 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.2(1) B.2(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of $1x10^4$ per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than $2x10^4$), with an accident dose of only $6x10^4$, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-190
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. PT-74-51 MPL # 10-105 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 50-551032EAAK1 Function: Pressure level signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR system I pressure Location: 2	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.2(1) B.2(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-190A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR Plant ID No. FT-74-56 MPL # 10-111A Component: Flow transmitter Manufacturer: GEMAC (GE) Model No.: 50-555111BDAA-3AA Function: Flow signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR Sys I containment Location: 2 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.2(1) B.2(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuth
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of $1x10^4$ per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than $2x10^4$), with an accident dose of only $6x10^4$, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-191
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 5 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-5T Function: Outbd recirc loop cont Accuracy: Req'd: N/A Demon: Category: A Service: RHR Sys I Location: O	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	See Appx 1 Note 2	"
	Relative Humidity(%)	100	100	(4)	"	Type Test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β	2×10^8 γ	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement, the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

5. This sheet applies to the following:

   FCV-74-52, MPL #10-154
   FCV-74-66, MPL #10-154

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-192
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-53 MPL # 10-25 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-4 Function: Inbd recic loop cont Accuracy: Req'd: N/A Demon: Category: A Service: RHR sys I Location: 9	Operating Time	1 years	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.7(1) B.7(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^6	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

   TVA will perform additional analyses or type tests to confirm that the operating time is acceptable.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-193
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-57 MPL # 10-39A Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: RHR sys I Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 6	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1) B.6(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test.	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-194
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. Appx 1 Note 4 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: RHR sys supp pool Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 6	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1) B.6(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Trikt
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

3. This sheet applies to the following:

   FCV 74-58 and -72 (MPL #10-38)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296 -

Sheet No. NEB-74-195
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual Heat Removal Plant ID No. Appendix 1 Note 3 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: RHR Sys I Test Valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 6	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1) B.6(2,3)	250 F	(4)	"	Type Test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuks
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

3. This sheet applies to the following:

   FCV-74-59 and -73 (MPL #10-34)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1, ,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-196
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-60 MPL # 10-26 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Spray inbd valve Accuracy: Req'd: N/A Demon: Category: A Service: RHR sys I contmt Location: 9	Operating Time	1 years	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 2
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-~~74-196A~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-60 MPL # 10-26 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Spray inbd valve Accuracy: Req'd: N/A Demon: Category: A Service: RHR sys I contmt Location: 8	Operating Time	1 years	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.8(1) B.8(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Apnx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 2
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-197
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-61 MPL #10-31A Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Spray inbd cont Accuracy: NA Req'd: Demon: Category: A Service: RHR sys T containment Location: 8	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figures B.8(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type test	None
	Aging	N/A		(2)		Appx 1 note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque test reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1, 3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-~~74-197A~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-61 MPL 10-31A Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Spray inhd cont Accuracy: NA Req'd: Demon: Category: A Service: RHR sys I containment Location: 9	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figures B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type test	None
	Aging	N/A		(2)		Appx 1 note 2	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque test reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of 30 days is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, TVA's judgement, the Limitorque operation will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-198
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FIS-74-64 MPL # 10-12A Component: Diff pressure indicating switch Manufacturer: Barton Model No.: 289A Function: Flow indication Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR sys II Location: 4	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figures B.4(1) B.4(2,3)	212 F	(4)	"	See Appx 1 Note 3	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 1	See Appx 1 Note 4	NCR BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that an operating time of one year would create problems with the proper functioning of this device. Similarly, aging is not expected to adversely affect this device; however, the available information is inconclusive.

3. FIS-74-64 (unit 3) - As a result of a HPCI HELB in compartment #1, the maximum temperature in compartment #5 will be 294° F for 30 seconds. The temperature will remain above 200° for only 60 seconds. Based on consideration of materials and heat transfer properties, it is reasonable to assume that the temperature spike will not adversely affect the switch.

4. In TVA's opinion, further modeling of the target area could reduce the radiation dose. The switches have capillary or "dead-ended" type instrument sensing lines which will not see the

3 X 10 dose from the fluid but rather see a dose as a function of the distance from the radiation source. Also, the bypass valves FCV-74-30 and 7 can be manually operated by handswitches in the control room.

TVA will commit to a type testing or replacement program for this switch in order to ensure utilization of qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-199
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FT-74-64 MPL # 10-109	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
Component: Flow transmitter Manufacturer: GEMAC (GE)	Temperature (F)	Figures B.5(1) B.5(2,3)		(4)		"	"
Model No.: 50-555111BDAA3AAA	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
Function: Flow signal	Relative Humidity(%)	100		(4)		"	"
Accuracy: Req'd: See Section Demon: 4.1.3 in report	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
Category: A Service: RHR sys II	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
Location: 5	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-200
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. PT-74-65 MPL # 10-105 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 50-551032EAAK1 Function: Press level signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR Sys II pressure Location: 5	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.5(1) B.5(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of $1x10^4$ per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than $2x10^4$), with an accident dose of only $6x10^4$, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-202
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-67 MPL # 10-25 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-4 Function: Inbd recic loop cont. Accuracy: Req'd: N/A Demon: Category: A Service: RHR sys II Location: 0	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.0(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Figure B.0(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β	2×10^8 γ	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes x No 565	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque test reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). In TVA's engineering judgement, this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-203
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FT-74-70 MPL # 10-111 Component: Flow transmitter Manufacturer: GEMAC (GE) Model No.: 50-555111BDAA3AAA Function: Flow signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: RHR sys II containment Location: 5 Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.5(1) B.5(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-018.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-203
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual Heat Removal Plant ID No. FCV-74-71 MPL # 10-39B Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: RHR Supp. Pool Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 6	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.6(1) B.6(2,3).	250 F	(4)	"	Type Test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikoff
Reviewed by: Charles Tusk
QA Acceptance:

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-205
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-74 MPL # 10-26 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Spray outbd cont. Accuracy: Req'd: N/A Demon: Category: A Service: RHR Sys II Location: 9	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-206
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-75 MPL # 10-31B Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Spray inbd cont Accuracy: Req'd: N/A Demon: Category: A Service: RHR SyS II CNTMT Location: 9	Operating Time	1 years	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 74-207
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-77 MPL # 10-33 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Outbd isol valve Accuracy: Req'd: N/A Demon: Category: A Service: Reactor head spray Location: 12	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.12(1) B.12(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-208
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-74-78 MPL #10-32 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00 Function: Inbd isol valve Accuracy: NA Req'd: Demon: Category: A Service: Reactor head spray Location: 0	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figures B.0(1,2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	Type test	None
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9	2×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 4	None
	Aging	N/A		(2)		Appx 1 Note 3	"
Flood Level Elev: 552' N/A Above Flood Level: Yes x No 621'	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance:

1. Limitorque test reports #600198, B-0027, and B-0003

2. Although this specific type operator (with Class B insulation) was not tested to the postulated pressure for the accident environment, in TVA's engineering judgement the operator would not be adversely affected by such pressure. Other Limitorque operators with identical housing designs (hermetically sealed, with double O-rings) have been tested successfully to pressures in excess of 80 psia.

   Likewise, this particular model operator was not tested to the postulated temperature for the accident environment; however, as shown in Limitorque report B-0027, Limitorque motor housings have sufficient thermal inertia to withstand 325° F for five minutes followed by a gradual decline to 250° F after one hour without allowing the motor temperature and internals to exceed 280° F. This particular type operator (Class B insulation) was successfully tested to 250° F for 24 hours. In TVA's engineering judgement, the operators with Class B insulation could tolerate this period of overheating to 280° F (about 50 minutes) without adverse effects on the proper functioning of the motor operator. Otherwise, the tests for Limitorques with Class B insulation exceed the accident temperature profile.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). In TVA's engineering judgement, this Limitorque operator is not adversely affected by aging considerations.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. The effects of beta radiation is insignificant; see 4.1.4 of the report.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-209
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual Heat Removal Plant ID No. Appendix 1 Note 1B Component: Temperature Element Manufacturer: Calimatic Model No.: 158B7061P016 (GE Part No.) Function: Outlet Temp. Meas. Accuracy: Req'd: Demon: Category: A Service: RHR HTX A Location: 8	Operating Time	1 year		(1)		Appendix 1 Note 2	NCR BFNNEB8015
	Temperature (F)	Figures B.8(1) B.8(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.8(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appendix 1 Note 2	NCR BFNNEB8015
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

NEB-74-209, APPENDIX 1, REVISION 0

1. This sheet applies to items TE-74-81, MPL #10-116A
   TE-74-82, MPL #10-116B
   TE-74-83, MPL #10-116C
   TE-74-84, MPL #10-116D

2. To date TVA has yet to receive any information on these items. Vendor drawings and materials information are still being actively sought through several sources, thus analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-210
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. PT-74-94 MPL # 10-113 Component: Pressure transmitter Manufacturer: GEMAC (GE) Model No.: 551032GAAN1 Function: Low press signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Supp pool disch header Location: 6	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.6(1) B.6(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)			
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-211
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR Plant ID No. See Appx 1 Note 1 Component: RHR pump motor Manufacturer: General Electric Model No.: 5K6348XC23A Function: Pump motor Accuracy: Req'd: See Section Demon: Category: A Service: RHR Pumps Location: 5	Operating Time	1 year		(1)	See Appx 1 Note 2	See Appx 1 Note 5	NCR BFNNEB8008
	Temperature (F)	Figures B.5(1) B.5(2,3)	292 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 3	"
	Relative Humidity(%)	100	100	(4)	"	Experience & Humidity testing	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 2	Generic test	None
	Aging	N/A		(2)		Appx 1 Note 4	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

NEB-74-211, APPENDIX 1, REVISION 0

1. This sheet applies to the following items:

   RHR Pump 1B, -1D, -2B, -2D, -3B, -3D (All MPL #10-3)

2. Topical Report of GE Vertical Induction Motors for Class IE Intake Cooling Pumps for St. Lucie Nuclear Power Plant Unit 2, revision 2, 8/31/79 (FF #103). This test is applicable to generic GE model 5K6 series.

3. Based on a factory production test. It is TVA's opinion that the 0.3 psia difference between the required and tested conditions is insignificant and will not adversely affect the proper functioning of the motor.

4. In TVA's engineering judgement, this motor is not adversely affected by aging considerations.

5. Although further evaluation is necessary to determine the qualified operating times, it is TVA's opinion that the GE motor will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-212
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: RHR Plant ID No. See Appx 1 Note 1 Component: RHR pump motor Manufacturer: General Electric Model No.: 5K6348XC23A Function: Pump motor Accuracy: Req'd: See Section Demon: Category: A Service: RHR Pumps Location: 2	Operating Time	1 year		(1)	See Appx 1 Note 2	See Appx 1 Note 5	NCR BFNNEB8008
	Temperature (F)	Figures B.2(1) B.2(2,3)	292 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 3	"
	Relative Humidity(%)	100	100	(4)	"	Experience & Humidity testing	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 2	Generic test	None
	Aging	N/A		(2)		Appx 1 Note 4	
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: C. Charles Funk
QA Acceptance: _____

1. This sheet applies to the following items:

   RHR Pump 1A, 1C, 2A, 2C, 3A, 3C (all MPL #10-3)

2. Topical Report of GE Vertical Induction Motors for Class IE Intake Cooling Pumps for St. Lucie Nuclear Power Plant Unit 2, revision 2, 8/31/79 (FF #103). This test is applicable to generic GE model 5K6 series.

3. Based on a factory production test. It is TVA's opinion that the 0.3 psia difference between the required and tested conditions is insignificant and will not adversely affect the proper functioning of the motor.

4. In TVA's engineering judgement, this motor is not adversely affected by aging considerations.

5. Although further evaluation is necessary to determine the qualified operating times, it is TVA's opinion that the GE motor will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-213
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. TE-74-95A MPL #10-98 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Line leakage Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RHR steam Location: 2	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.2(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-213A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. TE-74-95B MPL #10-98 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Line leakage Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RHR steam Location: 5	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.5(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Clark
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-213B
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. TE-74-95(C,D) MPL #10-98 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Line leakage Accuracy: Req'd: See section 4.1.3 Demon: Category: A Service: RHR steam Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-213C
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. TE-74-95(E,F) MPL #10-98 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Line leakage Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RHR steam Location: 12	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.12(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-74-213D
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. TE-74-95(G,H) MPL #10-98 Component: Temperature Element Manufacturer: Scam Model No.: S51-1 Function: Line leakage Accuracy: Req'd: See section Demon: 4.1.3 Category: A Service: RHR steam Location: 6	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8022
	Temperature (F)	Figure B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		Appx 1 Note 1	NCR BFNNEB8022
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Trask
QA Acceptance: _____

1. Test data has not been obtained to date; however, the manufacturer rates this resistive thermal detector at 100 psi and 500° F without a thermowell. The device is installed with a weatherproof head, so humidity should not be a problem. A materials consideration does not reveal any parts likely to fail under radiation exposure.

   This equipment is believed to be qualified, thus TVA will type test this resistive thermal detector and/or replace if required.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-214
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. Appx 1 Note 4 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: CS pump "A" Suction Valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 3	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Terk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 297°F in 25 seconds 1 and is 162°F in 120 seconds for unit 1 and 160°F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

4. This sheet applies to the following
   FCV-75-2 MPL # 14-7
   FCV-75-11 "

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NER-~~25-346~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. PS-75-7 ,-16 MPL #14-442B Component: Pressure Switch Manufacturer: Mercoid Model No.: DA-7043-804 Function: Pump "A" det Accuracy: Req'd: Demon: Category: A Service: Disch press Location: 3	Operating Time	1 year		(1)		See Appx 1 Note 1	See NCR BFNNEB8021
	Temperature (F)	Figure B.3(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8021
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, qualification information is unavailable. TVA will continue to pursue, through several sources, the location of the necessary information, and if unsuccessful, commit to type testing or replacement. This instrument has adequately functioned in the past, and TVA has no indications that this instrument would not properly function in the near future. In addition, Mercoid instruments are installed at several other nuclear plants with no indications of generic failures.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-217
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Residual heat removal Plant ID No. FCV-75-9 MPL # 14-68 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: CS Sys I flow isol Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 3	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See Appx 1 Note 2	"
	Pressure. (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 297°F in 30 seconds 1 and is 162°F in 120 seconds for unit 1 and 160 F at 120 seconds for units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250° F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-210
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FIS-75-21 MPL # 14-45B Component: Flow Switch Manufacturer: Barton Model No.: 289 Function: Flow detection & ann Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Sys I low flow Location: 3	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figures B.3(1) B.3(2,3)	212 F	(4)	"	See Appx 1 Note 3	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	Type Test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Terk
QA Acceptance: _____

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that an operating time of one year would create problems with the proper functioning of this device. Similarly, aging is not expected to adversely affect the proper functioning of this instrument; however, the available data is inconclusive.

3. The test for this device does not meet the accident requirements for temperature or radiation; however, it is expected, based on further modeling for radiation and a materials analysis, that this device could pass a test at this temperature and radiation. TVA will type test this device to confirm the above or replace it with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-220
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FT-75-21 MPL # 14-40 Component: Flow transmitter Manufacturer: GEMAC (GE) Model No.: 50-555111BDAA3AAA Function: Flow signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Sys I flowch press Location: 3 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.3(1) B.3(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-221
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core Spray Plant ID No. FCV-75-22 MPL # 14-26 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-1 Function: CS Sys I Test Bypass Valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 3	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 3	NCR BFNNEB8034
	Temperature (F)	Figure B.3(1) B.3(2,3)	250 F	(4)	"	See App 1 Note 2	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. This particular type operator (Class B insulation) was successfully tested to 250°F for 24 hours. The peak temperature is 297° F at 25 seconds and is 162°F at 120 seconds in unit 1 and 160°F at 120 seconds in units 2 and 3. It is TVA's opinion that this rapid rise and decrease in temperature is unlikely to subject the critical elements of the operator to a temperature greater than 250°F and, therefore, would not affect the proper functioning of the operator.

   TVA will commit to a testing program to verify the conclusions drawn on temperature-related behavior of the Limitorque operators with Class B insulation.

3. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-222
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FCV-75-23 MPL # 14-11 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Disch control Accuracy: Req'd: N/A Demon: Category: A Service: Sys I outbd disch Location: 9	Operating Time	1 years	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-224
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FCV-75-25 MPL #14-12 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Sys I control Accuracy: Req'd: N/A Demon: Category: A Service: Inbd disch valve Location: 9	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-226
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. Appx 1 Note 1 Component: Diff pressure indicating switch Manufacturer: Barton Model No.: 288 series Function: Press diff detection Accuracy: Req'd: See Section 4.1.3 in report Demon: Category: A Service: Sys I core diff Location: 8	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 2	See Appx 1 Note 3.	NCR BFNNEB8010
	Temperature (F)	Figures B.8(1) B.8(2,3)	212 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 2	Type test	NCR BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

NEB-75-226, APPENDIX 1, REVISION 0

1. This sheet applies to the following:

   PDIS-75-28, -56 (MPL #14-43)

2. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02.

3. To date, test data has not been obtained which addresses a one-year operating time or thermal aging. A materials analysis does not reveal any parts likely to fail due to thermal or radiation aging. In TVA's engineering judgement, the one-year operating time is not expected to be a problem. Analysis is presently underway to support the above.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-227
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core Spray Plant ID No. Appendix 1 Note 4 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-0 Function: Pump "B" Suction Valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 4	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.4(1) B.4(2,3)	250 F	(4)	"	Type Test	"
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

NEB-75-227, APPENDIX 1, REVISION 0

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

3. This sheet applies to the following:

   FCV 75-30 and -39 (MPL #14-7)

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-~~75-229~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. PS-75-35,-44 MPL #14-44 Component: Pressure Switch Manufacturer: Mercoid Model No.: DA-7043-804 Function: Pump "B" det Accuracy: Req'd: Demon: Category: A Service: Disch press Location: 4	Operating Time	1 year		(1)		See Appx 1 Note 1	See NCR BFNNEB8021
	Temperature (F)	Figure B.4(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8021
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. To date, qualification information is unavailable. TVA will continue to pursue, through several sources, the location of the necessary information, and if unsuccessful, commit to type testing or replacement. This instrument has adequately functioned in the past, and TVA has no indications that this instrument would not properly function in the near future. In addition, Mercoid instruments are installed at several other nuclear plants with no indications of generic failures.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-230
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core Spray Plant ID No. FCV-75-37 MPL # 14-68 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-00-5 Function: Sys II Flow Isol Valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 4	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.4(1) B.4(2,3)	250 F	(4)	"	Type Test	NONE
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-232
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FIS-75-49 MPL # 14-45 Component: Flow Switch Manufacturer: Barton Model No.: 289 Function: Flow detection & ann Accuracy: Req'd: See Section 4.1.3 in report Demon: Category: A Service: CS Sys II low flow Location: 4	Operating Time	1 year	6 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8010
	Temperature (F)	Figures B.4(1) B.4(2,3)	212 F	(4)	"	TYPE TEST	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"		None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$3x10^6$	(4)	See Appx 1 Note 2	See Appx 1 Note 3	NCR BFNNEB8010
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance:

1. Barton Engineering report R3-288A-1, page 7, paragraph 5.3.3, and Wyle summary report QSR-027-A-02

2. Based on a study of materials used in this device, it is not expected that an operating time of one year would create problems with the proper functioning of this device. Similarly, aging is not expected to adversely affect the proper functioning of this instrument; however, the available data is inconclusive.

3. The test for this device does not meet the accident requirements for radiation; however, it is expected, based on a materials analysis, that this device could pass a test for this radiation. TVA will type test this device to confirm the above or replace it with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-233
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FT-75-49 MPL # 14-40 Component: Flow transmitter Manufacturer: GEMAC (GE) Model No.: 50-555111BDAA3AAA Function: Flow det signal Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: CS Sys II low flow Location: 4 (units 1&3) Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8012
	Temperature (F)	Figures B.4(1) B.4(2,3)		(4)			"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	(1) 3×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8012
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

The operating conditions to which the pressure transmitters will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

1. The pressure transmitters are required to operate in the environment as specified on the system component evaluation work sheet.

2. The manufacturer's specifications for the pressure transmitters are as follows:

Temperature	- 185°F
Pressure	- Atmospheric
Relative Humidity	- Not Specified
Radiation	- Not Specified

Material breakdown analysis reveals the presence of electronic gear such as diodes and transistors. The specifications for these components are not available. The components are susceptible to a threshold gamma radiation of 1×10^4 per Table C-1 of the DOR Guidelines - 79-01B.

These devices are located in a low radiation zone (less than 2×10^4), with an accident dose of only 6×10^4, which is within an order of magnitude above the threshold. Also, the threshold is not a point of failure or end of useful life.

The devices will function in the environment to which they are exposed due to a LOCA or HELB for at least one hour. FSAR analyses for the design basis accidents assume that the reactor is placed in a stable hot shutdown condition within one hour. Thus the devices are qualified to perform their safety function assumed for a stable hot shutdown condition.

Therefore, in our engineering judgement based on available information, it is concluded that this evaluation provides justification for continued operation. Also, since the devices have a NEMA 4 case, relative humidity should have no effect on the operations.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-234
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core Spray Plant ID No. FCV-75-50 MPL # 14-26 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: CS Sys. II Test Bypass Valve Accuracy: Req'd: N/A Demon: Category: A Service: Water Location: 4	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.4(1) B.4(2,3)	250 F	(4)	"	Type Test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-235
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FCV-75-51 MPL # 14-11 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Disch control Accuracy: Req'd: N/A Demon: Category: A Service: Sys II Outbd disch Location: 9	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNER8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuls
QA Acceptance: _____

1. Limitorque Test Reports #B-0003, -0027, #600198

2. Various aging-related tests have been performed on Limitorque operators (see note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-75-237
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. FCV-75-53 MPL # 14-12 Component: Motor operator Manufacturer: Limitorque Model No.: SMB-2 Function: Disch control Accuracy: Req'd: N/A Demon: Category: A Service: Sys II inbd disch Location: 9	Operating Time	1 year	24 hours	(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8034
	Temperature (F)	Figure B.9(1) B.9(2,3)	250 F	(4)	"	Type test	None
	Pressure (PSIA)	Table B.1(1,2,3)	40	(4)	"	Type test	None
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7	2×10^8	(4)	See Appx 1 Note 1	Type Test	None
	Aging	N/A		(2)		Appx 1 Note 2	None
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Limitorque Test Reports B0003, B-0027, #600198

2. Various aging-related tests have been performed on Limitorque oeprators (see Note 1 above). It is TVA's engineering judgement that this Limitorque operator is not adversely affected by aging considerations.

   The operating time of one year is longer than the test duration of 24 hours; however, based on the temperature level of the test compared to the accident temperature profile, in TVA's judgement, the Limitorque operator will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-238
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. MPL #14-1 Component: Core spray pumps - motors Manufacturer: General Electric Model No.: 5K6336XC198A Function: Pump motor Accuracy: Req'd: N/A Demon: Category: A Service: Core spray Pumps Location: 4 bad pumps	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 4	NCR BFNNER8008
	Temperature (F)	Figures B.4(1) B.4(2,3)	292 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 2	"
	Relative Humidity(%)	100	100	(4)	"	Experience & Humidity testing	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$	$2x10^8$	(4)	See Appx 1 Note 1	Generic test	None
	Aging	N/A		(2)		Appx 1 Note 3	
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. Topical Report of GE Vertical Induction Motors for Class IE Intake Cooling Pumps for St. Lucie Nuclear Power Plant Unit 2, revision 2, 8/31/79 (FF #103). This test is applicable to generic GE model 5K6 series.

2. Based on a factory production test. It is TVA's opinion that the 0.3 psia difference between the required and tested conditions is insignificant and will not adversely affect the proper functioning of the motor.

3. In TVA's engineering judgement, this motor is not adversely affected by aging considerations.

4. Although further evaluation is necessary to determine the qualified operating times, it is TVA's opinion that the GE motor will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 75-238A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core spray Plant ID No. MPL #14-1 Component: Core spray pumps - motors Manufacturer: General Electric Model No.: 5K6336XC198A Function: Pump motor Accuracy: Req'd: See Section Demon: Category: A Service: Core spray Location: 3 A&C pumps	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 4	NCR BFNNEB8008
	Temperature (F)	Figures B.3(1) B.3(2,3)	292 F	(4)	"	Generic test	None
	Pressure (PSIA)	Table B.1(1,2,3)	14.7	(4)	"	See Appx 1 Note 2	"
	Relative Humidity(%)	100	100	(4)	"	Experience & Humidity testing	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$(A_3C)^7$ 3×10^7	2×10^8	(4)	See Appx 1 Note 1	Generic test	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

1. Topical Report of GE Vertical Induction Motors for Class IE Intake Cooling Pumps for St. Lucie Nuclear Power Plant Unit 2, revision 2, 8/31/79 (FF #103). This test is applicable to generic GE model 5K6 series.

2. Based on a factory production test. It is TVA's opinion that the 0.3 psia difference between the required and tested conditions is insignificant and will not adversely affect the proper functioning of the motor.

3. In TVA's engineering judgement, this motor is not adversely affected by aging considerations.

4. Although further evaluation is necessary to determine the qualified operating times, it is TVA's opinion that the GE motor will adequately meet the operating time requirements.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 76-239
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment inerting system Plant ID No. FCV-76-17 MPL #16-20-20 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Makeup outbd isln vlv J Accuracy: Req'd: N/A Demon: Category: A Service: Pri contmt N_2 Location:	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuke
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 76-239A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment inerting Plant ID No. FCV-76-18 MPL #16-20-22B Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inbd isln valve Accuracy: Req'd: N/A Demon: Category: A Service: Drywell N_2 makeup Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-76-239B
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment Inerting Plant ID No. FCV-76-19 MPL #16-20-22A Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Inbd isln valve Accuracy: Req'd: N/A Demon: Category: A Service: Suppression Chamber N_2 Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	5.1×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 76-239C
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment Inerting Plant ID No. FCV-76-24 MPL #16-20-21 Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: Outbd isln valve Accuracy: Req'd: N/A Demon: Category: A Service: Containmentl N_2 purge Location: 28	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019,
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.9×10^5		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-76-240
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment inerting system Plant ID No. FSV-76-17 MPL #16-20-20 Component: Solenoid valve Manufacturer: Asco Model No.: X8315 Function: Makeup outbd isln vlv J Accuracy: Req'd: Demon: Category: A Service: PRI cont N2 Location: 8 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	A - 1 day B - 1 year	30 days	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figure B.8(1,2,3)	290 F	(4)	"	Type test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	(1) 3.5×10^5 (2,3) 5.1×10^5	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuls
QA Acceptance: _____

1. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

2. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

3. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-76-241
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment inerting system Plant ID No. See Appx 1 Note 1 Component: Solenoid valve Manufacturer: Asco Model No.: X-8315C28 Function: INBD ISLN valve Accuracy: Req'd: Demon: Category: A Service: Drywell N2 makeup &	Operating Time	A - 1 day B - 1 year	30 days	(1)	See Appx 1 Note 2	See Appx 1 Note 4	None
	Temperature (F)	Figure B.8(1,2,3)	290 F	(4)	"	Type test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	(1)3.5×10^5 (2,3)5.1×10^5	1×10^6	(4)	See Appx 1 Note 3	See Appx 1 Note 4	None
Location:	Aging	N/A		(2)		Appx 1 Note 4	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. This sheet applies to the following items FSV-76-18 and -19 (MPL #16-20-22).

2. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

3. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

4. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-76-242
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment Inerting System Plant ID No. FSV-76-24 MPL #16-20-21 Component: Solenoid Valve Manufacturer: ASCO Model No.: WPHTX8300B45R Function: Purge Outboard Isolation Valve Accuracy: Req'd: Demon: Category: A Service: PRI Containment N2 Location: 8	Operating Time	A-1 day B-1 year	30 days	(1)	See Appx 1 Note 1	See Appx 1 Note 3	None
	Temperature (F)	Figure B.8(1) B.8(2,3)	290 F	(4)	"	Type Test	"
	Pressure (PSIA)	Table B.1(1,2,3)	60	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.9×10^5	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. ASCO report number AQ5-21678/TR - This report covered an 8300 and an 8316 series valve. All valves of a particular series number are of the same basic design. Differences in materials, etc., are noted by differences in prefix or suffix letters.

2. Based on a material analysis of this valve, TVA has determined that the only materials limiting the allowable rad dose to the solenoid is the Buna-N diagram material. According to the guidelines of 79-01B, Buna-N is acceptable up to a dose of 1×10^6 rad.

3. Based on similarities between this valve and the actual valve tested, this valve has been judged to surpass the basic environmental values listed. In addition, even should the valve fail, it has been determined that it would fail safe (based on materials analysis). That is, should the diaphragms fail due to radiation, the valve would close and perform the isolation function required of it.

   The only material identified in the valve which is subject to significant aging effects is the Buna-N diaphragms. In TVA's opinion, aging effects over 40 years at normal conditions would be insignificant. Aging effects from higher temperature and rad doses over the one-year accident period have also been judged to pose no serious threat to the proper functioning of this valve.

   The operating time of one year pertains to category B. TVA has determined that the environment will not cause the valve to fail in such manner to adversely affect plant safety of accident mitigation.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 76-243
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment inerting Plant ID No. Addx 1 Note 1 Component: Hydrogen element Manufacturer: General Electric Space Model No.: 47E226428G2 Function: H_2 detection Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Drywell Location: 0	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.0(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ 2×10^8 β 4×10^9		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

NEB-76-243, APPENDIX 1, REVISION 0

1. This item applies to H E-76-37, -37A, -38, -38A, -39, -39A, -40 (all MPL #16-20-45)

2. Please refer to TVA letter from L. M. Mills to NRC Director Harold R. Denton dated May 21, 1980, regarding the containment atmospheric monitoring system which discusses the continued use of these devices.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-244
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. See Appx 1 Note 1 Component: Level Switch Manufacturer: GEMS Model No.: XM-36425 type Function: Fluid level detection Accuracy: Req'd: Demon: Category: A Service: Radwaste - dw Sump Location: O	Operating Time	1 yr		(1)		See Appx 1 Note 2	See NCR BFNNEB8024
	Temperature (F)	Figure B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.0(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β		(4)		See Appx 1 Note 2	See NCR BFNNEB8024
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

NEB 77-244, APPENDIX 1, REVISION 0

1. This sheet applies to the following items:

LIS-77-1A	MPL #20-351-1
LIS-77-1B	MPL #20-352-1
LT-77-1A	MPL #20-351
LT-77-1B	MPL #20-352
LT-77-14A	MPL #20-360
LT-77-14B	MPL #20-361
LIS-77-14A	MPL #20-360-1
LIS-77-14B	MPL #20-361-1

2. These instruments, which service the drywell and equipment drain sumps, are referenced in TVA operations procedures as aids in detecting certain accidents. In actuality, they provide the operator "symptomatic" information which is desirable but not essential in mitigation of accidents. It has been determined that failure of these instruments would not preclude safe shutdown or accident mitigation. TVA will either replace the existing devices with qualified devices or determine if revision of operating procedures to remove inference that these devices are necessary for accident mitigation is acceptable.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-249
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. See Appx 1 Note 1 Component: Solenoid Valve Manufacturer: VERSA Model No.: VSG-3521 Function: Drywell FD Sump Accuracy: Req'd: Demon: Category: A Service: Water Location: 6	Operating Time	A - 1 hour B - 1 year		(1)		See Appx 1 Note 2	See NCR BFNNEB8026
	Temperature (F)	B.6(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 2	See NCR BFNNEB8026
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Turk
QA Acceptance: _____

NEB 77-249, APPENDIX 1, REVISION 0

1. This sheet applies to the following items.

FSV 77-2A	MPL #20-82
FSV 77-2B	MPL #20-83
FSV 77-15A	MPL #20-94
FSV 77-15B	MPL #20-95

2. These solenoid valves which service the drywell floor drain and equipment drain sumps are required only to close for isolation purposes. No credit is taken for reopening the valves. Analysis of actual physical configuration of solenoid valves indicates that all postulated solenoid failures would result in closing of the valves, thus these valves will fail-safe. Ultimate failure of all O-rings due to radiation damage could not result in reopening of the valves. Not withstanding this argument, TVA will commit to either qualification by type testing or replacement with qualified equipment.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2)

(3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-249A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. FCV-77-2A&B MPL #20-82,83 Component: Limit switch Manufacturer: Microswitch Model No.: BZE6-2RN Function: Outlet floor drain sump Accuracy: Req'd: N/A Demon: Category: A Service: Inbd isol valve Location: 6	Operating Time	1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Temperature (F)	Figures B.6(1) B.6(2,3)	400 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	1×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuts
QA Acceptance: _____

1. Microswitch (Honeywell) catalog No. 40 limit and enclosed switches.

2. Qualification to the specified environmental conditions cannot be documented at this time. However, the microswitch catalog describes a standard basic switch in a phenolic case with metalic components of silver and beryllium copper. It was, therefore, judged to have a radiation tolerance of 10^8 rads. Other operating features are temperature tolerance (400° F) and a wide range of seals. It was concluded that interim operation can be justified. TVA is committed to pursuit of qualified documentation and type testing or replacement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-249B
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. FCV-77-15A&B MPL #20-94,95 Component: Limit switch Manufacturer: Microswitch Model No.: BZE6-2RN Function: Drywell floor drain sump Accuracy: Req'd: N/A Demon: Category: A Service: Outb isol valve Location: 6	Operating Time	1 hour		(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Temperature (F)	Figures B.6(1) B.6(2,3)	400 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7	1×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. Microswitch (Honeywell) catalog No. 40 limit and enclosed switches.

2. Qualification to the specified environmental conditions cannot be documented at this time. However, the microswitch catalog describes a standard basic switch in a phenolic case with metalic components of silver and beryllium copper. It was, therefore, judged to have a radiation tolerance of 10^8 rads. Other operating features are temperature tolerance (400° F) and a wide range of seals. It was concluded that interim operation can be justified. TVA is committed to pursuit of qualified documentation and type testing or replacement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-250
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. LS-77-8A MPL #20-355 Component: Level Switch Manufacturer: Autocon Model No.: M-4 Function: Fluid Level Detection Accuracy: Req'd: Not Demon: Specified Category: A Service: Radwaste Sump Location: 2	Operating Time	1 year		(1)		Appendix 1 Note 1	NCR BFNNEB8029
	Temperature (F)	Figures B.2(1) B.2(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appendix 1 Note 1	NCR BFNNEB8029
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, TVA has received limited infomation on these items. Vendor drawings and additional materials information are still being actively sought through several sources; thus analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   Information received to date suggests that these quality switches do not contain parts susceptible to environemntal damage. Complete material information is expected from the vendor in the near future. It appears, at this time, that these devices will pass an environmental type test.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-251
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. LS-77-8B MPL #20-355 Component: Level Switch Manufacturer: Autocon Model No.: M-4 Function: Fluid Level Detection Accuracy: Req'd: Not Demon: Specified Category: A Service: Radwaste Sump Location: 5	Operating Time	1 year		(1)		Appendix 1 Note 1	NCR BFNNEB8029
	Temperature (F)	Figures B.5(1) B.5(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appendix 1 Note 1	NCR BFNNEB8029
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuale
QA Acceptance: _____

1. To date, TVA has received limited infomation on these items. Vendor drawings and additional materials information are still being actively sought through several sources; thus analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   Information received to date suggests that these quality switches do not contain parts susceptible to environemntal damage. Complete material information is expected from the vendor in the near future. It appears, at this time, that these devices will pass an environmental type test.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-~~77-252~~
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. TE-77-14 MPL #20-362 Component: Temperature Element Manufacturer: Thermo-Elect Model No.: B7582-1 Function: Temp Measure Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Radwaste Equip Drain Sump Location: 0	Operating Time	1 year		(1)		Appendix 1 Note 1	NCR BFNNEB8027
	Temperature (F)	Figure B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^8 γ 4×10^9 β		(4)		Appendix 1 Note 1	NCR BFNNEB8027
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

1. To date, TVA has yet to receive any information on these items. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   Based on past operating experience, the temperature elements are expected to perform satisfactorily. Materials of construction are stainless steel, ceramic, and copper constantan. It is in TVA's engineering judgment that the specified environment will not adversely affect the components function. Although qualified documentation is not available at this time, TVA is committed to pursue qualified information, type testing, or replacement with qualified components.

   It should be noted that even if TE-77-14 fails to indicate sump temperature, the operator should conservatively operate in the recirculation mode prior to discharging to waste collector tank.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-259
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. TE-77-17 MPL #20-366 Component: Temperature Element Manufacturer: Thermo-Elect Model No.: B7582-1 Function: RB Equipment Sump - Temp Accuracy: Req'd: See Section Demon: 4.1.2 of report Category: A Service: Water Location: 4	Operating Time	1 year		(1)		Appendix 1 Note 1	NCR BFNNEB8027
	Temperature (F)	Figures B.4(1) B.4(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		Appendix 1 Note 1	NCR BFNNEB8027
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, TVA has yet to receive any information on these items. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   Based on past operating experience, the temperature elements are expected to perform satisfactorily. Materials of construction are stainless steel, ceramic, and copper constantan. It is in TVA's engineering judgment that the specified environment will not adversely affect the components function. Although qualified documentation is not available at this time, TVA is committed to pursue qualified information, type testing, or replacement with qualified components.

   It should be noted that even if TE-77-17 fails to indicate sump temperature, the operator should conservatively operate in the recirculation mode prior to discharging to waste collector tank.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 77-260
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. LS-77-17A MPL #20-365 Component: Level Switch Manufacturer: Autocon Model No.: M-5 Function: RB Equip. Sump Lo-Hi-Hi-Hi Accuracy: Req'd: Not Demon: Specified Category: A Service: Water Location: 4	Operating Time	1 year	2 hours	(1)		Appendix 1 Note 1	NCR BFNNEB8029
	Temperature (F)	Figures B.4(1) B.4(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	$3x10^7$		(4)		Appendix 1 Note 1	NCR BFNNEB8029
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuls
QA Acceptance: _____

1. To date, TVA has received limited infomation on these items. Vendor drawings and additional materials information are still being actively sought through several sources; thus analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   Information received to date suggests that these quality switches do not contain parts susceptible to environemntal damage. Complete material information is expected from the vendor in the near future. It appears, at this time, that these devices will pass an environmental type test.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-77-261
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radwaste Plant ID No. LS-77-17B MPL #20-486 Component: Level Switch Manufacturer: Autocon Model No.: M-4 Function: RB Equip. Sump Lo-Hi-Hi-Hi Accuracy: Req'd: Not Demon: Specified Category: A Service: Water Location: 4	Operating Time	1 year		(1)		Appendix 1 Note 1	NCR BFNNEB8029
	Temperature (F)	Figures B.4(1) B.4(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3×10^7		(4)		Appendix 1 Note 1	NCR BFNNEB8029
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, TVA has received limited infomation on these items. Vendor drawings and additional materials information are still being actively sought through several sources; thus analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment.

   Information received to date suggests that these quality switches do not contain parts susceptible to environemntal damage. Complete material information is expected from the vendor in the near future. It appears, at this time, that these devices will pass an environmental type test.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-78-262
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: FP Cooling and Demineralizing Plant ID No. See Appendix 1 Note 1 Component: Level Switch Manufacturer: Meletron Model No.: 9241-6SS10A Function: Skimmer Surge Tank L-Hi Accuracy: Req'd: See Paragraph Demon: 4.1.3 Category: A Service: Water Location: 13 Flood Level Elev:552' N/A Above Flood Level: Yes / No	Operating Time	1 year		(1)		Appendix 1 Note 2	See NCR BFNNEB8028
	Temperature (F)	Figures B.13(1) B.13(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		Appendix 1 Note 2	See NCR BFNNEB8028
	Aging	N/A		(2)		Appx 1 Note 2	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. LS-78-1A, MPL# 19-65
   LS-78-1B, MPL# 19-66
   LS-78-1C, MPL# 19-67
   LS-78-1 (D-G), MPL# 19-63

2. To date, TVA has yet to receive any information on these items. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending upon the results of this analysis, TVA will commit to type testing of these devices or replacement with qualified equipment. Meletron level switches are fairly simple in nature, and TVA has no reason to believe that the devices could not be qualified. The devices have been used in normal nuclear service for several years and have performed satisfactorily.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-78-265
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: FP cooling and demineralizing Plant ID No. LS-78-1(D,E,F,G) MPL #19-63 Component: Level Switch Manufacturer: Barksdale Model No.: D2H-M18SS Function: Skimmer surge tank level lo-lo Accuracy: Req'd: Demon: Category: A Service: Water Location: 13	Operating Time	1 year	1 hour	(1)	See Appx 1 Note 1	See Appx 1 Note 3	N
	Temperature (F)	Figure B.13(1,2,3)	212 F	(4)	"	Generic test	"
	Pressure (PSIA)	Table B.1(1,2,3)	15	(4)	"	"	"
	Relative Humidity(%)	100	100	(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4	1×10^6	(4)	See Appx 1 Note 2	See Appx 1 Note 3	None
	Aging	N/A		(2)		Appx 1 Note 3	None
Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Terk
QA Acceptance: _____

1. Barksdale qualification procedure 9993 and Wyle summary report QSR-018-A-012.

2. The radiation dose of 1 X 10^6 rad is based upon a materials analysis of the pressure switch. The materials in the device which limit the allowable radiation dose are the seals (Buna-N or Viton) which, according to several studies including the guidelines furnished in bulletin 79-01B, are acceptable up to a dose of 1 X 10^8 rad.

   Based on the materials evaluation and the relatively low temperature and radiation doses encountered by the device, aging effects will not adversely affect this device, in TVA's engineering judgement. Similarly, the operating time of one year has been considered and TVA has identified no adverse effects from temperature or any other parameter on the functioning of this device.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-85-267
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Control rod drive system Plant ID No. FSV-85-35(A&B) MPL 73-140(A&B) Component: Solenoid valve Manufacturer: Asco Model No.: HVA86-030 Function: Pilot valve B Accuracy: Req'd: Demon: Category: A Service: CRD backup scram Location: 8	Operating Time	1 hour		(1)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8031
	Temperature (F)	Figure B.8(1,2,3)		(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6		(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8031
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. The radiation dose of 1×10^6 rad is based upon a materials analysis of the solenoid valve. The diaphragm is composed of Buna-N material which can withstand doses of 1×10^8 rad. Since the valve need only operate for one hour, the actual dose seen is approximately 8×10^4 rad. Similar ASCO valves (by design and materials) have been tested in excess of the temperature, pressure, and humidity values specified; therefore, it is expected that these valves would pass a type test.

2. This solenoid valve is required to open for accident mitigation purposes. No credit is taken for closing the valve. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in opening of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in closure of the valve. Not withstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-85-268
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Control rod drive system Plant ID No. FCV-85-37(A&B) MPL #3-31(A&B) Component: Solenoid valve Manufacturer: Asco Model No.: HVA90-405 Function: Dr & vent pilot vlv A Accuracy: Req'd: Demon: Category: A Service: CRD scram Disch vol 8 Location:	Operating Time	A - 1 hour B - 1 year		(1)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8031
	Temperature (F)	Figure B.8(1,2,3)		(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6		(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNER8031
	Aging	N/A		(2)		Appx 1 Note 2	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. The radiation dose of 1×10^6 rad is based upon a materials analysis of the solenoid valve. The diaphragm is composed of Buna-N material which can withstand doses of 1×10^6 rad. Since the valve need only operate for one hour, the actual dose seen is approximately 8×10^4 rad. Similar ASCO valves (by design and materials) have been tested in excess of the temperature, pressure, and humidity values specified; therefore, it is expected that these valves would pass a type test to these valves. TVA will either implement such tests or replace the valves.

2. This solenoid valve is required to open for accident mitigation purposes. No credit is taken for closing the valve. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in opening of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in closure of the valve. Not withstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-85-268A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: CRD system Plant ID No. FCV-85-37A,B,C MPL #3-32B Component: Limit Switch Manufacturer: Namco Model No.: D1200G Function: CRD scram disch vol Accuracy: Req'd: N/A Demon: Category: A Service: Vent control valve B Location: 8	Operating Time	1 year		(1)		Appx 1 Note 1	NCR BFNNEB8019
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6		(4)		Appx 1 Note 1	NCR BFNNEB8019
	Aging	N/A		(2)		Appx 1 Note 1	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Teuke
QA Acceptance: _____

To date test data has not been obtained for the D1200G (EA080); however, test data is available for similar Namco limit switches (EA170, 180, 740). The manufacturer reports that the EA080 is a high quality switch, similar to the tested models, and is rated for 90° C (194° F). It has a weatherproof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that the Namco D1200G will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-85-272
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Control rod drive system Plant ID No. FCV-85-39A MPL #3-13-126 Component: Position switch (scram outlet valve) Manufacturer: Microswitch Model No.: BZE6-2RN Function: Inlet valve Accuracy: Req'd: Demon: N/A Category: A Service: CRD scram Location: 8	Operating Time	1 hour		(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Temperature (F)	Figures B.8(1) B.8(2,3)	400 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6	1×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tusk
QA Acceptance: _____

1. Microswitch (Honeywell) catalog No. 40 limit and enclosed switches.

2. Qualification to the specified environmental conditions cannot be documented at this time. However, the microswitch catalog describes a standard basic switch in a phenolic case with metalic components of silver and beryllium copper. It was, therefore, judged to have a radiation tolerance of 10^8 rads. Other operating features are temperature tolerance (400° F) and a wide range of seals. It was concluded that interim operation can be justified. TVA is committed to pursuit of qualified documentation and type testing or replacement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 85-273
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Control rod drive system Plant ID No. FCV-85-39B MPL #3-13-127 Component: Position switch (scram outlet valve) Manufacturer: Microswitch Model No.: BZE6-2RN Function: Outlet Accuracy: Req'd: N/A Demon: Category: A Service: CRD scram Location: 8 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	1 hour		(1)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Temperature (F)	Figures B.8(1) B.8(2,3)	400 F	(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6	1×10^8	(4)	See Appx 1 Note 1	See Appx 1 Note 2	NCR BFNNEB8006
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance:

1. Microswitch (Honeywell) catalog No. 40 limit and enclosed switches.

2. Qualification to the specified environmental conditions cannot be documented at this time. However, the microswitch catalog describes a standard basic switch in a phenolic case with metalic components of silver and beryllium copper. It was, therefore, judged to have a radiation tolerance of 10^8 rads. Other operating features are temperature tolerance (400° F) and a wide range of seals. It was concluded that interim operation can be justified. TVA is committed to pursuit of qualified documentation and type testing or replacement.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-85-274
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Control rod drive Plant ID No.: FSV-85-39A MPL #3-13-117 Component: CRD scram inlet valve (solenoid) Manufacturer: Asco Model No.: HVA-90-405-2A Function: CRD solenoid scram Accuracy: Req'd: Demon: Category: A Service: CRD exh H_2O Location: 8 Flood Level Elev: 552' N/A Above Flood Level: Yes / No	Operating Time	1 hour		(1)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8031
	Temperature (F)	Figure B.8(1,2,3)		(4)	"	"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)	"	"	"
	Relative Humidity(%)	100		(4)	"	"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.4×10^6		(4)	See Appx 1 Note 1	See Appx 1 Note 2	See NCR BFNNEB8031
	Aging	N/A		(2)		Appx 1 Note 2	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. The radiation dose of 1 X 10^6 rad is based upon a materials analysis of the solenoid valve. Tolerance to radiation is limited by the diaphragm which is composed of Buna-N material that can withstand doses of 1 X 10^6 rad . Since the valve need only operate for one hour, the actual dose seen is approximately 8 X 10^4 rad. Similar ASCO valves (by design and materials) have been tested in excess of the temperature, pressure, and humidity values specified; therefore, it is expected that these valves would pass a type test to these valves. TVA will implement such tests or replace the valves.

2. This solenoid valve is required to open for accident mitigation purposes. No credit is taken for closing the valve. Analysis of actual physical configuration of the solenoid valve indicates that all postulated solenoid failures would result in opening of the valve, thus the valve will fail-safe. Ultimate failure of the diaphragm due to radiation damage could not result in closure of the valve. Not withstanding this justification, TVA will commit to either a type testing or replacement program for this valve.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-85-276
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Control rod drive Plant ID No. LS-85-45(A-E) MPL #3-231A-E Component: Level Switch Manufacturer: Robertshaw Model No.: SL-305-E3-X Function: CRD scram disch vol level Accuracy: Req'd: Demon: Category: A Service: CRD logic Location: 8	Operating Time	1 hour		(1)		See Appx 1 Note 1	See NCR BFNNEB8004
	Temperature (F)	Figure B.8(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2.1×10^7		(4)		See Appx 1 Note 1	See NCR BFNNEB8004
	Aging	N/A		(2)		Appx 1 Note 1	
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

1. To date, test data has not been obtained. Vendor drawings and materials information is expected in the near future; thus, analysis of this item will continue. Depending upon the results of this analysis, TVA will commit to type testing in order to verify material analysis results or commit to replacement of the equipment.

   Although test data has not yet been obtain, it is believed that the equipment can be qualified. These are high quality switches and have performed well under normal plant service for some time. It should also be noted that their operation is required for only a short time.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 90-279
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. RE-90-136 MPL # 17-230	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
Component: Ion chamber Manufacturer: General Electric	Temperature (F)	1 - B.8(1) 2 - B.8(2,3) 3 - B.7(2,3)		(4)		"	"
Model No.: GE part No. 237X731G001	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
Function: Rad detection	Relative Humidity(%)	100		(4)		"	"
Accuracy: Req'd: See Section Demon: 4.1.3 in report	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
Category: A Service: Main steam	Radiation (RAD)	(1,2) (3) 2×10^6		(4)		See Appx 1 Note 1	NCR BFNNEB8005
Location: 8 - units 1&2 7 - unit 3	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment.

These GE components have been used in normal nuclear plant operation for several years. The ion chambers are simple in construction and are not known to be susceptible to the given environments. In TVA's opinion, the devices could be qualified by type testing.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 90-280
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. RE-90-137 MPL # 17-230 Component: Ion chamber Manufacturer: General Electric Model No.: 237X731G001 Function: Main steam line chc det Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Area monitors Location: 7	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.7(1) B.8(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^6		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment.

These GE components have been used in normal nuclear plant operation for several years. The ion chambers are simple in construction and are not known to be susceptible to the given environments. In TVA's opinion, the devices could be qualified by type testing.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 90-281
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. RE-90-138 MPL # 17-230 Component: Ion chamber Manufacturer: General Electric Model No.: 237X731G001 Function: Main stm line chb det Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Area monitor Location: 8 - Units 1&2 7 - Unit 3 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	1 - B.8(1) 2 - B.8(2,3) 3 - B.7(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	(1,2) 2.1×10^7 (3) 2×10^6		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment.

These GE components have been used in normal nuclear plant operation for several years. The ion chambers are simple in construction and are not known to be susceptible to the given environments. In TVA's opinion, the devices could be qualified by type testing.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 90-282
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. RE-90-139 MPL # 17-230 Component: Ion chamber Manufacturer: General Electric Model No.: 237X731G001 Function: Main steam line chd det Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Area monitor Location: 7	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.7 (1) B.7 (2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	2×10^6		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funk
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment.

These GE components have been used in normal nuclear plant operation for several years. The ion chambers are simple in construction and are not known to be susceptible to the given environments. In TVA's opinion, the devices could be qualified by type testing.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-90-283
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. Appx 1 Note 1 Component: Sensor and convertor Manufacturer: General Electri Model No.: GE part No. 194X927G014 Function: Refueling zones ch A det Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Area monitor Location: 15	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.15(1) B.15(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		See Appx 1 Note 1	NCR BFNNER8005
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. This sheet applies to NE-90-140, MPL # 17-432.
   -141, MPL # 17-432.

2. To date, sufficient qualification information is unavailable to make a proper evaluation. TVA will continue to pursue, through several sources, the location of the necessary qualification information, and if unsuccessful, TVA will commit to type testing or replacement. These instruments have functioned properly in the past and TVA has no indications that they would not continue in the future.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-90-284
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. Appx 1 Note 1 Component: Sensor and convertor Manufacturer: General Electric GE part No. Model No.: 194X927G012 Function: Reac zone exh ch A det Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: Area monitors Location: 15	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNER8005
	Temperature (F)	Figures B.15(1) B.15(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^4		(4)		See Appx 1 Note 1	NCR BFNNER8005
	Aging	N/A		(2)		"	"
Flood Level Elev:552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance: _____

1. This sheet applies to NE-90-142, MPL # 17-430.
   -143, MPL # 17-430.

2. To date, sufficient qualification information is unavailable to make a proper evaluation. TVA will continue to pursue, through several sources, the location of the necessary qualification information, and if unsuccessful, TVA will commit to type testing or replacement. These instruments have functioned properly in the past and TVA has no indications that they would not continue in the future.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 90-286
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. RE-90-283A MPL # 16-20-47 Component: Fission Product monitor Manufacturer: General Electric Model No.: Function: Sensor fission product monitor Accuracy: Req'd: See Section 4.1.3 in report Demon: Category: A Service: DW radurbine Location: 0 Flood Level Elev: 552' N/A Above Flood Level: Yes No	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.0(1,2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	γ $2.x10^8$ β $4x10^9$		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuck
QA Acceptance: _____

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment. These devices are know to be high quality equipment which has performed well for some time under normal plant operating conditions. There is, at this time, no reason to believe that they will not continue to function properly.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB- 90-286A
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Radiation monitoring Plant ID No. RE-90-283B MPL # 16-20-47 Component: Fission product monitor Manufacturer: General Electric Model No.: Function: Sensor fission product monitor Accuracy: Req'd: See Section Demon: 4.1.3 in report Category: A Service: DW rad Location: 6	Operating Time	1 year		(1)		See Appx 1 Note 1	NCR BFNNEB8005
	Temperature (F)	Figures B.6 (1) B.6 (2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	3.1×10^7		(4)		See Appx 1 Note 1	NCR BFNNEB8005
	Aging	N/A		(2)		"	"
Flood Level Elev: 552' N/A Above Flood Level: Yes No	Submergence	N/A	N/A	(4)	N/A	N/A	N/A

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Tuk
QA Acceptance:

To date, TVA has yet to receive enough information on these items to make a proper evaluation. Vendor drawings and materials information are still being actively sought through several sources; thus, analysis of these devices will continue. Depending on the results of this continued analysis, TVA will type test or replace this equipment with qualified equipment. These devices are know to be high quality equipment which has performed well for some time under normal plant operating conditions. There is, at this time, no reason to believe that they will not continue to function properly.

SYSTEM COMPONENT EVALUATION WORK SHEET (Rev 2) (3)

Facility: Browns Ferry Nuclear Plant
Unit: 1,2,3
Docket: 50-259, 50-260, 50-296

Sheet No. NEB-NM-287
Revision 0
Date 10/27/80

EQUIPMENT DESCRIPTION Contract 90744 & 91750	ENVIRONMENT			DOCUMENTATION REF		QUALIFICATION METHOD	OUTSTANDING ITEMS
	Parameter	Specification	Qualification	Specification	Qualification		
System: Neutron Monitoring Plant ID No. GE-7-104 MPL #7-104 Component: Tip System Valve Assembly Manufacturer: GE Model No.: 136B1302G2 Function: Neutron Monitoring Accuracy: Req'd: N/A Demon: Category: A Service: Tip System Location: 8 Flood Level Elev:552' N/A Above Flood Level: Yes No	Operating Time	A-1 hour B-1 year		(1)		Appx 1 Note 1	See NCR BFNNEB8007
	Temperature (F)	Figure B.8(1) B.8(2,3)		(4)		"	"
	Pressure (PSIA)	Table B.1(1,2,3)		(4)		"	"
	Relative Humidity(%)	100		(4)		"	"
	Chemical Spray	N/A	N/A	(4)	N/A	N/A	N/A
	Radiation (RAD)	4.3×10^5		(4)		Appx 1 Note 1	See NCR BFNNEB8007
	Aging	N/A		(2)		"	"
	Submergence	N/A	N/A	(4)	NA	NA	NA

Notes: (1) See Section 2.4 in 79-01B report.
(2) See Section 4.1.2 in 79-01B report.
(3) All notes and other information not on these sheets are on the attached appendix sheets.
(4) See Section 3.0 and/or Appendix B in 79-01B report.

Prepared by: Alex Melnikow
Reviewed by: Charles Funke
QA Acceptance: _____

1. To date, qualification information is unavailable for this GE equipment. However, TVA will pursue through GE the appropriate qualification documents.

If a coolant leak develops in a guide tube as a result of a LOCA, the valve assembly is capable of isolating the reactor side of the 3/8" guide tube. Since this device is required to operate only during a LOCA, the actual temperature and pressure are 140° F and normal atmosphere. It is TVA's opinion the environment outside the containment due to a LOCA would not adversely affect the redundant isolating subsystems or the assembly.

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