-NOTICE-

=9105090262 w/lb. dHd. H30/91

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-NOTICE-



SUPPLEMENTAL INFORMATION TVA'S COMPLIANCE TO 10CFR50.49 - ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT IMPORTANT TO SAFETY FOR NUCLEAR POWER PLANTS VOLUME 3

TABLE OF CONTENTS

BINDER NUMBER	REVISION	EQUIPMENT TYPE	VENDOR
WBNEQ-ITE-001	1	Strap-On RTD (Minco)	Westinghouse
WBNEQ-ITE-003	1	Resistance Temperature Detector (RCS Well-Mounted)	RdF
WBNEQ-ITE-004	2	Resistance Temperature Detector (Fast Response Well-Mounted)	RdF
WBNEQ-ITS-001	3	Temperature Switches	Fenwal
WBNEQ-ITS-002	4	Temperature Switches	Static-O-Ring
WBNEQ-IZS-001	4	EA 180 Series Limit Switches Manufactured after 7/30/80	Namco
WBNEQ-IZS-002	2	EA 180 Series Limit Switches Manufactured between 9/5/78 and 7/30/80	Namco
WBNEQ-IZS-003	3	EA 740 Limit Switches Manufactured after 10/01/81	Namco
WBNEQ-IZS-004	3	EA 740 Limit Switches Manufactured between 2/20/78 and 10/01/81	Namco
WBNEQ-IZS-005	0	EA 180 Limit Switches Manufactured after December 1986	Namco
WBNEQ-JBOX-001	4	Junction Boxes	Various





PRINCO: 01/11/39	IDENTIFICATION MAT	TRIX CAI OPEB_ILME (2)	EVENI SAEEIY_EUNCIION
UNIT_DEVICE_14-000000000000000000000000000000000000	709·11" LC 71 C62-5411 4-1	A 100D A 103D A 100D A 100D A 1M0 A 1M0	L ACCURATE REACTOR VESSEL LEVEL FW/C INDICATION IS REQUIRED FOR ALL MS/C EVENTS AND REQUIRES RH/C TEMPERATURE COMPENSATION. CV/C
WBN-1-TE -068-0376 -D 1-TE -068-0376 -D 090 DEAC LEVEL CAP TUBE TEMP COMP 58810	708º 2" LC 71662-54114-1	A 1000 A 1000 A 1000 A 1000 A 140 A 140	L ACCURATE REACTOR VESSEL LEVEL FW/C INDICATION IS REQUIRED FOR ALL MS/C EVENTS AND REQUIRES RH/C TEMPERATURE COMPENSATION. CV/C
WENC	714" 4" LC 71662-54114-1	A 1000 A 1000 A 1000 A 1000 A 140 A 140	L ACCURATE REACTOR VESSEL LEVEL FW/C INDICATION IS REQUIRED FOR ALL MS/C EVENTS AND REQUIRES RH/C TEMPERATURE COMPENSATION. CV/C
WEN-1-TE -0.68-0378 -0 1-TE -068-0378 -0 090 WEN-1-TE -0.68-0378 -0 1-TE -068-0378 -0 090	752110" LC 71C62-54114-1	A 1000 A 1000 A 1000 A 1000 A 140 A 140	L ACCURATE REACTOR VESSEL LIVE FW/C INDICATION IS REQUIRED FOR ALL MS/C EVENTS AND REQUIRES RH/C TEMPERATURE CONPENSATION- CV/C
REAL LEVIL - WBN-1-TE -068-0379 -0 1-TE -068-0379 -0 010 REAC LEVEL CAP TUBE TEMP COMP	727 8" LC 71C62-54114-	A 1300 A 1000 A 1000 A 1000 A 100 A 100	L ACCURATE REACTOR VESSEL LEVEL FW/C INDICATION IS REQUIRED FOR ALL MS/C EVENTS AND REQUIRES RH/C TEMPERATURE COMPENSATION. CV/C
	PREPARER	R/CATE_GJB /DATE_SRP_4	$\frac{R_{1}}{123/86} = \frac{R_{1}}{1-1L-89} = \frac{R_{1}}{1-1L-89} = \frac{R_{1}}{1-1L-89}$



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BINDER NO. : W3NEQ-ITE -001 MANUFACTURER : MINCO PAGE 2 OF 3

	· · · · ·		LCCATION				
EQIS_NUBBERUNII_ DESCRIPTION	DEXICE ID NO	AZMIIH_ DEB	ELEV(1) BH/BAD Conigaci	<u>CAI</u> (2)	QPER_IIME	EXENI	SAEETY_EUNCTION
		223	7471 00 00	•	1000		
	-003-0720 -5	220	713° 3" LU 71647-5/11/-1	A	1000		ACCURATE REALTOR VESSEL LEVEL
REAC LEVEL CAP TUBE TERP COAP	26807		1102-34114-1	A A	1000		EVENTS AND DEDUTES FOR ALL
			•	Δ	140	RH/C	TEMPERATURE COMPENSATION.
· · ·				Ā	100	CV/C	
	-0/(-0797	0.00	7041404		10.2-		
NON-1-16 -000-0303 -C 1-12		0.40	705 10" LL	A	1000	L	ACCURATE REACTOR VESSEL LEVEL
KENC LEVEL CAP TOBE TEAP CORP	20010		1102-34114-1	4	1000		EVENTS AND DECHTDES
				A 0	1300	PH/C	TEMPERATURE CONPENSATION
				Â	1000	CV/C	
URN-1-TE -068-0384 -E 1-TE	-048-0334 -5				1005		ACCUDATE DEACTOR VESSEL LEVEL
PEAC LEVEL CAP THRE TEND COMP	56200 -2 56200		716:2-5/11/-1	А	1009		ACCURATE REACION VESSEL LEVEL
KENG ELVEE GAT TODE TENT CONT	32307		11002-34114-1	Δ	1000	NS/C	EVENTS AND REQUIRES FOR ALL
				Â	140	RH/C	TENPERATURE COMPENSATION.
			•	A	140	CV/C	
WBN-1-TE -068-0385 -E 1-TE	-068-0335 -=	302	7531	۵	1000		ACCUPATE REACTOR VESSEL LEVEL
REAC LEVEL CAP TUBE TEMP COMP	\$3809		71652-54114-1	<u>۵</u> .	1000	EW/C	THOTCATION IS REQUIRED FOR ALL
				A	1000	MS/C	EVENTS AND REQUIRES
				٩.	1HO.	RH/C	TEMPERATURE COMPENSATION.
				A	140	CV/C	
WBN-1-TE -068-0386 -E 1-TE	-053-0386 -=	054	7331 9" LC	A	1000	L.	ACCURATE REACTOR VESSEL LEVEL
REAC LEVEL CAP TUBE TEMP COMP	\$8809		71602-54114-1	A	1000	FW/C	INDICATION IS REQUIRED FOR ALL
				A	1000	MS/C	EVENTS AND REQUIRES
				А А	1 M D 1 M D	RH/C CV/C	TEMPERATURE COMPENSATION.

Em 4/21/86 PREPARERIDATE GJB 4/23/86 241042 1-16-89 CHECKED/DATE SRP

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BINDER NO. : HENEQ-ITE-OF MANUFACTURER : MINCO PAGE 3 OF 3

EQIS_NUMBEB QESCBIPTION	NAII-DEXICE-II	NOTET - NAF	AIMIIH_ PER	LOCATION ELEY(1) RH/BAD CONTRACT	CAI OPER_II! (2)	IE EYENI	SAEEIX_EUNCIION
WBN-1-TE -068-0393 -E REAC LEVEL CAP TUBE TEMP COP	1-TE -058-039 MP	-≡ \$8809	213	707' LC 71Co2-54114-1	A 1000 A 1000 A 1000 A 1000 A 1M0 A 1M0	L FW/C MS/C RH/C CV/C	ACCURATE REACTOR VESSEL LEVEL INDICATION IS REQUIRED FOR ALL EVENTS AND REQUIRES TEMPERATURE COMPENSATION.
							i

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CHECKED/DATE	SRP	4/23/86	26986

BINDER NO. <u>WBNEQ-ITE-001</u> PLAN	WBN UNIT(S) 1 SHEET 1 OF 1
BINDER TITLE MINCO RTD	COMPUTED E. E. MC Henne DATE 12/19/26
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TAB A

NOTES

1. Elevations shown are <u>Actual</u> elevations for equipment located in the Reactor Building and <u>Floor</u> elevations for equipment located outside the Reactor Building. Actual elevations for all equipment are documented in TAB F.

See Page B-1 for source of Category and Operating Time assignments.



PAGE A-4

BIN	DER NO. <u>WBNEQ-ITE-OO1</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>1</u> O R <u>1</u> R_ DER TITLE <u>MINCO RTD</u> COMPUTED <u>GJB</u> DATE <u>4/16/86</u>
	CHECKED <u>SRP</u> DATE <u>4/23/86</u> <u>2/07</u>
A.	DOCUMENTATION
	Equipment Description Resistance Temperature Detector (RTD)
- 14. -	Vendor/Manufacturer <u>Minco Products, Inc.</u>
	Equipment Model No.(s) <u>S8809</u>
	<u>\$8810</u>
	QUALIFICATION REPORTS
	(1) Title/Number/Revision Equipment Qualifica- RIMS B45 850614 35 tion Test Report - Minco Surface Mounted RTDs/WCAP-8687, Supp. 2-E42A, Rev. 1 DATE January 1985
	OTHER (ANALYSIS, VENDOR DATA, ETC.)
~	(2) TVA Environmental Data Drawing 47E235-42 R2
	(3) Category and Operating Times Calculation, System 68, R8
	(WBNOSG4-017, B45 860722 218)
	(4) Westinghouse Equipment Qualification Data Package,
	EODP-ESE-42A_R1 (B45 851030 356)
	(5) Westinghouse Auditable Link Document for Unit 1, EQUAL-WAT,
	Rev. 2, January, 1985, (B45 850321 352)
	(6) Westinghouse Drawing 2654C65, Rev. 8
	(7) Minco Products, Inc. Drawing S8809, sheets 1 and 2, Rev. C
	(8) Minco Products, Inc. Drawing S8810, sheets 1 and 2, Rev. C
	NOTE: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the binder. This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.

	R TITLE MINCO RID COMPUTED $\mathcal{P}(\beta)$ DATE $S[18]X6$ CHECKED $SRP/2K$ DATE $S[18]X6$	
	· · ·	
В.	CONCLUSION OF REVIEW (Check only one block)	
	X Equipment Qualified (Pending Satisfactory Resolution of Open Ite	ms
	Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule	
	Equipment Qualification Not Established by Documentation	
	The second second and the second seco	
	Equipment Not Qualified Based on lest failures	
(OPEN ITEMS AND OUALIFICATION DEFICIENCIES	
4	I) Section F - Conduit and Grounding Drawing 45w860-9 must be	
-	revised to show a connection that is qualified for submergence.	•
-		
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		<u>,</u>							<u></u>			
C.	QUALIFIC	ATION CR	ITERIA									
-	Criteria Followin	Used to g (Indic	Demonst ate Whice	trate Q ch Crit	ualific eria is	ation i Applic	is in A cable)	Accorda :	ince wi	th th	e	
		Componen and/or N	nts are (NREG-058	Qualifi 88 Cate	ed to t gory I	he Crit (IEEE32	teria (23-1974	of 10C1 4)	R50.49			
	X	Componen Category 01B (IEE	nts are (7 II or 1 E323-197	Qualifi the DOR 71) (DO	ed to t Guidel R Guide	the Crit ines of lines A	teria E 1E Bu Applica	of NURI 111etin able to	2G-0588 No. 7 o only	9– BFN)		
	JUSTIFIC	ATION/CC	MMENTS	This_e	quipmen	t was l	oought	under	the_sc	ope_o	f	
	Change o	f Contra	act 128 (on the	WBN NSS	S cont:	ract w	ith We	stingho	use,		
	Janal Te	21	10.90	(OFR 90	0214 11	1 _ TAI	P F6)				-	
	dated Ja	nuary_31	, 1980	(QEB 80	0214_11	<u> </u>	<u> </u>				-	
											-	
•	INDICATE	OTHER F	REGULATO	RY DOCU	MENTS A	ND/OR	INDUST	ry stai	DARDS	MET		
	INDICATE	OTHER F	REGULATO	RY DOCU	MENTS A	ND/OR	INDUST	RY STAI	DARDS -	MET		
•	INDICATE	OTHER F	REGULATO	RY DOCU	MENTS A	ND/OR	INDUST	RY STAI	NDARDS -	MET	-	
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· · ·		OTHER F	REGULATO	RY DOCU	MENTS A	AND/OR	INDUST	RY STAI	NDARDS	MET	-	
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BIND	ER NO. <u>WBNEQ-ITE-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>4</u> OF R 1 R
BIND	ER TITLE MINCO RTD COMPUTED GJB DATE 5/23/86
	CHECKED <u>SRP/DLK</u> DATE <u>5/27/86</u> Hok
D.	<u>QUALIFICATION METHODOLOGY</u> (Check only one block)
	X Test of Identical Item Under Identical Conditions or Unde Similar Conditions with Supporting Analysis
	Test of Similar Items with Supporting Analysis
	Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
	Experience with Identical or Similar Equipment Under Simi Conditions with Supporting Analysis
	JUSTIFICATION/COMMENTS Reference OR(1), pages 24 and 31-35 (TAB D
	specifies the equipment tested. The Field Verification Data
	(TAB F) specifies what is installed at the plant. The Traceabilit
	Package (TAB E11) links the plant RTD serial numbers to the WBN
	NSSS contract and the Purchase Order No. The Westinghouse Audit-
	able Link Document, EQAL-WAT, Item ESE-42, p. 9 (TAB E9) links the
	Purchase Order number to the test report. Westinghouse letter
	WAT-D-6920 (B45 860328 600) - In Traceability Package - TAB E11)
	also links the test report in TAB D to the Watts Bar contract.
	•
	· · · · · · · · · · · · · · · · · · ·
	
	PAGE B-44 RI

		-	CHECKED	A DATE	4/2-7/86
E.	EQU	IPMENT DESCRIPTION			
	Is	the equipment identifi	ied in the qualif	ication report i	dentical to th
	pla	nt equipment which red	quires qualificat	ion (yes/no/NA)?	Yes
			<u>Plant Device</u>	Qualification <u>Document</u>	<u>Reference</u>
	(1)	Equipment Type	RTD	SAME	QR(1), page 24
	(2)	Manufacturer	MINCO	SAME	QR(1), page 1
	(3)	Model Number(s)	<u>58809</u>	SAME	QR (1), page 24
			<u>58810</u>	SAME	QR(1), page 24
	(4)	Serial Number(s)	See TAB F	146	<u>QR(1), p.24</u>
				039	<u>QR(1), p.24</u>
				_058	<u>QR(1), p.24</u>
					<u>QR(1), p.24</u>
	(5)	Identify Component- Unique checksheet attached:	<u>NA</u>		
	JUS	TIFICATION/COMMENTS	The model numbers	have_extra_char	acters
	on	the end which designat	tes the size of t	he tube the RTD	block fits.
	How	ever, this does not at	ffect qualificati	on, as stated in	the test
	rep	ort (QR(1)) conclusion	ns on pages 20 an	d 21. Therefore	, these
	add	itional characters wil	ll not be shown o	n the model numb	ers listed
	abo	ve			

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$\frac{R_{1}}{R}$	
DINDER IIILEMINCU_RIDCOMPUTEDGJDDATE_ <u>5/15/80</u>	. <u></u>
CHECKED <u>SRP</u> DATE <u>5/18/86</u> 20 	

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification R1 documentation and/or evaluation and reference the source. Is the interface a requirement for our application (Yes/No)? (Note below.) If yes, enter requirement in QMDS, if no, provide justification.

		Plant		
		Requirement?	Reference	
<u>Interface</u>	Identify Interface	(Yes/No)	<u>Test Report</u>	
Mounting Bolts	NONE	NA	<u>NA</u>	
External Process				
Connections	NONE	<u> </u>	<u>NA</u>	
Electrical	<u>See Comments Below</u>	<u>NA</u>	<u>NA</u>	
Connections				
Conduit Seals	See Comments Below	NA	<u> </u>	
0 01-	NONE	37.4		
connector Seals	NONE	NA	<u>NA</u>	
Oriontation	NONE	۸۲A	NA	
OTTENCALION	Install per Westing-			
Physical	house Drawing		п	1
Configuration	2654065 *	No	OP(1) = 7	•
CONTINUACION	2034003 ~	NO	UK(L). D./.	
Other	NONE	NA .	NA	
00102				
JUSTIFICATION/CON	MMENTS The moisture i	intrusion problem	exhibited	
in the test via	the insulation resista	nce data taken (OR(1), p.35)	
prompted the iss	uance of SCR WBNNEB85()6 (TAB E7) which	<u>requires</u> R	1
the ethylene prop	pylene lead wires of a	all these RTDs (n	ot just the	
submerged device	s) to be protected by	<u>a watertight con</u>	nection.	
This connection	<u>is shown on TVA Drawin</u>	ig 45W860-9 (TAB	<u>E8). The</u>	•
				1
configuration sh	own includes a Conax o	connector, which	<u>is qualified</u>	
		••• •••	·	
per binder WBNEQ	-CSC-001, and Raychem	splices, which a	re qualified	
non binden UDNEO	SPI 0 001			
her binder wonro	-3ruu-VVI.			
*This drawing has	not had any changes -	ada airea the a	ما - بيم مما الم	1
in the test reco	rt that affect qualif	ication (TAR E19		, L
- THE FREE FEAR	reg char arteer dugitt	Tracton (TWD DIA	•/•	

PAGE <u>B-6</u>

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			CHE(CKED	DATE	<u>4/2×/36</u>
G.	TEST	SEQU	ENCE			<u> </u>
	(1)	Test acci (yes	Sequence: Was the test sec dent environment in accordar /no/NA)? (note below)	quence establince with IEEE- Yes/No/	shed t 323 (7 <u>NA</u>	o simulate the 4), paragraph 6.3. <u>Reference</u>
		(a)	Equipment inspected for dam	nage <u>YES</u>		QR(1), pp. 13 & 31-34
		(Ъ)	Baseline performance measurements taken	YES		QR(1), pp.31-34
		(c)	Equipment aged:			
			Thermal	YES		QR(1), p.17
			Radiation	YES		QR(1), p.17
			Wear	NA		NA
		(d)	Vibration/seismic testing conducted	YES		QR(1), p. 18, App. B & C
		(e)	Design basis event (DBE) exposure	YES		QR(1), p.19
		(f)	Post-DBE exposure	YES		QR(1), pp.12, 19 & 131-134
		(g)	Final inspection and disassembly	YES		QR(1), pp.19, 48 & 31-35
	(2)	Was desc	the same piece of equipment ribed in item (1) above (ye	used throughd s/no/NA)? <u>YES</u>	out the	e test sequence
	(3)	Have beer (Ref	the test equipment, test equip	quipment accur yes/no/NA)? <u>YP</u>	acies IS	and calibration da
	JUS7 to a (1) disa insp (3)	(IFICA in RTT (g) - issemb cectic Test	TION/COMMENTS (1)(c) - Wea because it is a passive de Disassembly - As far as can bly was performed as part of on, calibration and insulati equipment accuracies were n	r - This type vice with no m be ascertaine the final ins on resistance ot included, h	of agi noving ed from spectic checks out are	ng is not applicab parts. 1 the test report, on, just a visual 3. e available for aud
	or	inspec	tion at Westinghouse.			

EQP085.53

BINDI		E MINCO RTD COMPUTED Dys CHECKED 4	DATE <u>4/16/86</u> RR DATE <u>4/20/36</u>
н.	AGIN	<u>G</u>	
<i>.</i>	(1)	Was aging considered in the qualification (Yes/no/NA)? <u>YES</u> (Reference <u>QR(1), pp. 3</u> JUSTIFICATION/COMMENTS NONE	program ,6,9,14_and_17).
	(2)	Were the following effects considered in t	he aging program:
		Aging Effect	Yes/No/NA Reference
		Thermal aging	QR(1), pp YES 9,14 & 1
	,	Radiation exposure	QR(1), pp YES 7,9,15 &
		Vibration (non-seismic) aging	<u>NO NA</u>
		Operational (electrical/mechanical/process stress aging) <u>NA</u> <u>NA</u>
		JUSTIFICATION/COMMENTS Vibration Aging -	The omission of this ty
		of test is justified because: 1) No proble	ms were encountered in
		seismic test. 2) RTDs are passive devices	with no moving or loose
		parts. 3) The surveillance and maintenanc	<u>e_program_is_adequate_t</u>
		correct_any_problems_that_might_arise_from	this_aging_effect_such
		loosened bolts and nuts.	
	(3)	Were all known synergistic effects which a significant effect on equipment performanc program (yes/no/NA)? <u>NA</u> (Reference	re believed to have a e considered in the agi
		JUSTIFICATION/COMMENTS <u>NUREG-0588 Categor</u>	y_II_requirements_do_no
		require that synergistic effects be addres	sed.
	(4)	Thermal Aging:	
		(a) Was thermal aging considered in the quantum (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p</u>	ualification program p. 3,6,9,14 & 17).

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		CHECKED ATE 42/16
H.	AGING (C	Continued)
	(b)	Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference: <u>QR(1), p. 9</u>).
		JUSTIFICATION/COMMENTS NONE
	(c)	Was the basis for thermal aging identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p.3</u>).
		JUSTIFICATION/COMMENTS <u>Also see Westinghouse letters TVA-85-</u>
		176 and TVA-85-172 in TAB El and E2 respectively.
	(d)	Was the aging acceleration rate justified and the parameters o time and temperature identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 9 and Westinghouse lett</u> <u>TVA-85-176 (B70 850925 006) - TAB E1.</u>
		<u>Parameter Plant Maximum Normal Test Equivalent</u>
		Temperature 120°F 250°F 120°F Time 40 years 504h 21.8 years
		JUSTIFICATION/COMMENTS See TAB Cl for calculation extending
		the qualified life.
	(e)	Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 9 and TAB C1</u>).
•	. ·	JUSTIFICATION/COMMENTS <u>NONE</u>
	(f)	If activation energies were used for determining accelerated aging parameters, are they properly referenced to the source of the technical data (yes/no/NA)? YES (Reference Westinghouse letter TVA-85-172 (B70 850925 002)-TAB E2).
		JUSTIFICATION/COMMENTS NONE
		*

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H. <u>AGING</u> (C	Continued)
(g)	If a regression line was used for determining accelerated agin parameters, are test points or failure modes identified on the line (yes/no/NA)? <u>NA</u> (Reference).
	JUSTIFICATION/COMMENTS NONE
(h)	Was the equipment operated during the thermal aging (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 14</u>).
	JUSTIFICATION/COMMENTS NONE
(5) Rad	iation Aging Exposure:
(a)	Was radiaton aging exposure considered in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p.3</u>).
	JUSTIFICATION/COMMENTS NONE
- (Ъ)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference).
(Ъ)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was
(Ъ)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was
(Ъ)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device.
(Ъ) (с)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device. Was the basis for radiation aging exposure identified in the cualification program (yes/no/NA)? YES
(Ъ) (с)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? NA (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? YES (Reference QR(1), p. 3 and Westinghouse letter TVA-85-172</pre>
(Ъ) (с)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? NA (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? YES (Reference QR(1), p. 3 and Westinghouse letter TVA-85-172 (B70 850925 002) - TAB E2).</pre>
(b) (c)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS <u>This was not necessary, as a test was</u> <u>performed on the assembled device.</u> Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 3 and Westinghouse letter TVA-85-172</u> (B70 850925 002) - TAB E2). JUSTIFICATION/COMMENTS <u>NONE</u>
(Ъ) (с)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? NA (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? YES (Reference QR(1), p. 3 and Westinghouse letter TVA-85-172 (B70 850925 002) - TAB E2). JUSTIFICATION/COMMENTS NONE</pre>
(Ъ) (с)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? NA
(b) (c)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS <u>This was not necessary, as a test was</u> performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 3 and Westinghouse letter TVA-85-172</u> (B70 850925 002) - TAB E2). JUSTIFICATION/COMMENTS <u>NONE</u></pre>
(b) (c)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS <u>This was not necessary, as a test was</u> performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 3 and Westinghouse letter TVA-85-172</u> (B70 850925 002) - TAB E2). JUSTIFICATION/COMMENTS <u>NONE</u></pre>
(b) (c)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 3 and Westinghouse letter TVA-85-172</u> (B70 850925 002) - TAB E2). JUSTIFICATION/COMMENTS <u>NONE</u></pre>
(b) (c)	<pre>Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference). JUSTIFICATION/COMMENTS This was not necessary, as a test was performed on the assembled device. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p. 3 and Westinghouse letter TVA-85-172</u> (B70 850925 002) - TAB E2). JUSTIFICATION/COMMENTS <u>NONE</u></pre>

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BINDER TITLE	MINCO RTD COMPUTED	<u>GJB</u> DATE <u>4/16/86</u> <u>5377</u>
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		,2-27-88
H. <u>AGING</u> (Co	ntinued)	
(d)	Is the radiation test exposu acceptable (Yes/No/NA)? <u>Yes</u>	re dose and dose rate (Reference: <u>QR(1) p. 17</u>
	and Westinghouse letter TVA-	<u>85-172 (B70 850925 002)-TAB</u>
	Plant normal ambient radiati	on 7
_	dose (rd)	<u>5.45 x 10 (21.8 yr. dc</u>
	Test exposure.dose (rd)	1.6×10^8
	Test exposure dose rate (rd/	hr) 2.18×10^6
	Test exposure source type (e.g., Co-60 gamma)	<u>Co - 60 gamma</u>
•	JUSTIFICATION/COMMENTS (1)	Worst case 40 year normal
	<u>dose is 1 x 10 rads. (2) N</u>	lormal and Accident Doses wer
	combined in the test.	
(6) Vibr	ation (non-seismic) Aging:	
(a)	Were the effects of non-seis normal and abnormal operation qualification program* <u>No</u>	mic vibration induced during on addressed in the (Reference:
· .	JUSTIFICATION/COMMENTS See	Justification/Comments for
	H(2) on page 8 of this TAB.	
(b)	Was the basis for vibration in the qualification program (Reference:	aging identified and justifi 1 (Yes/No/NA)? <u>NA</u>
	JUSTIFICATION/COMMENTS NONE	<u>.</u>
		·
		• •
*Qualificat documentat	ion program refers to the tes ion including TVA analyses in	st report and any supplementa 1 Tab C of the binder.

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•	BINDER NO. WBNEQ-ITE-001 PLANT WBN UNIT(S) 1 SHEET 12 OF 27
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	CHECKED SRP DATE 4/23/86 2494
	H. <u>AGING</u> (Continued)
	(7) Operational Stress Aging:
	 (a) Were the effects of electrical, mechanical, and process operational stresses induced during normal and abnormal operation addressed in the qualification program (Yes/No/NA)? <u>NA</u> (Reference:). JUSTIFICATION/COMMENTS <u>None</u>
	(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (Yes/No/NA)? <u>NA</u> (Reference:).
	JUSTIFICATION/COMMENTS <u>None</u>
	(8) Was the qualified life of the equipment and its basis defined in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>OR(1), p. 9</u>).
	Qualified life (Document in QMDS) <u>21.8 years</u>
	JUSTIFICATION/COMMENTS See TAB C1.
	(9) Were replacement intervals for the equipment or its components defined in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB C1</u>).
	JUSTIFICATION/COMMENTS No specific replacement intervals for
	any components of the RTD were specified in the qualification
	program. The instruction manual states that no periodic
	maintenance is required.

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BINC	ER TITLE MINCO RTD	COMPUTED	20B DA	TE 4/16/86	R
		CHECKED	48 DA	TE <u>4/2.48(</u>	
I.	MATERIALS ANALYSIS				
	Identification of Materials Sus Radiation Degradation and Aging Materials Analysis)	ceptible to (Use Secti) Significan on C of Bin	t Thermal and der for Det	nd/or ailed
	Material/Property/Function	Radiation Threshold	<u>Reference</u>	Activation Energy	<u>Referenc</u>
	Hypalon/Elongation/ (a) <u>Wire Jacket</u>	<u>NA</u>	NA	1.13	Westingho letter TV (B70 8509 <u>TAB E2</u>
	Epoxy/Flexural Strength/ (b) <u>Potting Material</u>	<u>NA</u>	NA	0.98	
	EPR/Dielectric Strength/ (c) <u>Wire Insulation</u>	<u>NA</u>	<u>NA</u>	0.90	
	(d)				
	(e)				
	JUSTIFICATION/COMMENTS <u>1) Ra</u>	diation_val	ues were no	t given in t	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. 2) See TAB C	diation_val nderwent_ra 1_for_Arrhe	<u>ues were no</u> diation tes nius Calcul	t given in t ting which y ations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. 2) See TAB C	<u>diation val</u> nderwent ra 1 for Arrhe	<u>ues were no</u> diation tes nius Calcul	t given in ting which wations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. 2) See TAB C	diation_val nderwent_ra 1_for_Arrhe	ues were no diation tes nius Calcul	t given in t ting which w ations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. <u>2) See TAB C</u>	diation_val nderwent_ra 1 for Arrhe	ues were no diation tes nius Calcul	t given in t ting which w ations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. <u>2) See TAB C</u>	diation_val nderwent_ra 1_for_Arrhe	ues were no diation tes nius Calcul	t given in t ting which w ations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. <u>2) See TAB C</u>	<u>diation val</u> <u>nderwent ra</u> <u>1 for Arrhe</u>	ues were no diation tes nius Calcul	t given in t ting which w ations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. <u>2) See TAB C</u>	diation_val nderwent_ra 1_for_Arrhe	ues were no diation tes nius Calcul	t given in t ting which w ations.	the test
	JUSTIFICATION/COMMENTS <u>1) Ra</u> report because the equipment u fully completed. <u>2) See TAB C</u>	diation_val nderwent_ra 1_for_Arrhe	ues were no diation tes nius Calcul	t given in t ting which w ations.	the test

BIND	er no	WBNEQ-ITE-001 PLANT WBN UNIT(S) SHEET 14 OF 2
BIND	ER TIT	LE MINCO RTD COMPUTED DATE 4/16/86
		CHECKED DATE
J.	EQU SPE	IPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE CIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS
1	(1)	Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (yes/no/NA)? <u>YES</u> (Reference <u>QR(1), p.5</u>).
		Identify Acceptance Criteria: 1) Insulation resistance must be greater .
		than 500,000 ohms to guarantee a functional accuracy of - 1.0°F.
		2)Repeatability of the calibration must be - 0.2°F.
	(2)	Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (yes/no/NA)? YES (Reference $QR(1)$, pp. 13, 14, & 135)
		Identify baseline and functional testing: 1) Calibration measurements
		before and after each test to verify repeatability. 2) Analog and
		digital recordings for verifying continuous operability during testing.
		3) Insulation_resistance_measurements_before, during and after HELB
		simulation to verify accuracy.
		JUSTIFICATION/COMMENTS None
	(3)	Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? <u>NA</u> (Reference).
		JUSTIFICATION/COMMENTS Insulation resistance measurements were taken
		periodically throughout the LOCA test, as documented on page 35 of the
		test_report (TAB D). Measurement of the performance was by evaluation
		of the recorded RTD outputs (QR(1), pp. 131-142). Insulation resistance
		was selected to guarantee functional accuracy. Load is an irrelevant

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J. <u>EQU</u> <u>PER</u> (Co	IPMENT FORMAN ntinue	<u>ELECTRICAL</u> ICE_SPECIFICA ed)	CHARACTERISTICS NECESSARY TO TIONS CAN BE SATISFIED UNDER	ENSURE THE ACCIDENT CONDITIO
. (4)	Do t oper	the applied 1 tating condit	oads during baseline testing ions (Yes/No/NA)? <u>NA</u> (Ref	reflect normal ference:
	JUSI	TIFICATION/CO	MMENTS <u>Baseline testing cons</u>	sisted of calibra-
	tion is a	<u>checks at v</u>	parameter for these RTDs.	op. 31-34). Load
	is c	considered ac	ceptable based on the applica	ation.
(5)	Iden equi	ntify electri Ipment perfor	cal characteristics necessary mance specifications can be s	to ensure the satisfied.
	(a)	Parameter	Plant Normal Conditions	Reference
		Voltage	NA	NA
		Load	NA	NA
		Frequency	NA	NA
•	•	Accuracy	See Open Item 2	
		Other(s)		
· ·		<u> </u>		
		JUSTIFICATI	ON/COMMENTS	
·				
	-			

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J. EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDIT (Continued) (b) Parameter Specific Accident Conditions Reference Voltage NA NA NA Load NA NA NA Frequency NA NA Westinghout Accuracy <u></u>		· · · · · · · · · · · · · · · · · · ·	CHECKED <u>SRP</u> DATE <u>5/</u>	27/86 2for
(b) Parameter Specific Accident Conditions Reference Voltage NA NA Load NA NA Frequency NA	J. <u>EQUI</u> <u>PERF</u> (Con	<u>PMENT ELECTRIC</u> ORMANCE SPECIF tinued)	AL CHARACTERISTICS NECESSARY TO EN ICATIONS CAN BE SATISFIED UNDER AC	ISURE THE CIDENT CONDITI
Voltage NA NA Load NA NA Frequency NA NA Accuracy ±5°F EQDP-ESE-4; JUSTIFICATION/COMMENTS (1) See discussion in Section P on ps 26 of this TAB on response time. (2) Applied voltage is 100 maximum across sensor resistance (TAB I - Note 5 on Minco drawings \$8809 and \$8810. (3) See Section M(5) Comments for a discussion on insulation resistance values and their relationship to accuracy. (c) (c) Parameter Demonstrated Conditions Reference Voltage NA	(b)	Parameter	Specific Accident Conditions	Reference
Load NA NA Frequency NA NA Accuracy ±5°F EQDP-ESE-4; Dther(s)		Voltage	NA	NA
Frequency		Load	NA	NA
Accuracy ±5°F EQOP-ESE-4/ p. 14 (TAB i Other(s)		Frequency	NA	<u>NA</u>
0ther(s)		Accuracy	<u>+5°F</u>	EQDP-ESE-42A
JUSTIFICATION/COMMENTS (1) See discussion in Section P on ps 26 of this TAB on response time. (2) Applied voltage is 101 maximum across sensor resistance (TAB I - Note 5 on Minco drawings S8809 and S8810. (3) See Section M(5) Comments for a discussion on insulation resistance values and their relationship to accuracy. (c) Parameter Demonstrated Conditions NA Load NA Frequency NA Accuracy ±1°F Other(s)		Other(s)		<u>p. 14 (1AB EI</u>
<pre>maximum across sensor resistance (TAB I - Note 5 on Minco drawings S8809 and S8810. (3) See Section M(5) Comments for a discussion on insulation resistance values and their rela- tionship to accuracy. (c) Parameter</pre>		JUSTIFICATION	/COMMENTS (1) See discussion in Se	ection P on pag
a discussion on insulation resistance values and their rela- tionship to accuracy. (c) Parameter Demonstrated Conditions Reference Voltage NA		26 of this TA	B on response time. (2) Applied v	voltage is 10VD
tionship to accuracy. (c) Parameter Demonstrated Conditions Reference Voltage NA		26 of this TA maximum acros drawings S880	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5)	roltage is 10VD 5 on Minco Comments for
(c) Parameter Demonstrated Conditions Reference Voltage NA		26 of this TA maximum acros drawings S880 a discussion	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an	roltage is 10VD 5 on Minco Comments for ad their rela-
Voltage NA Load NA Frequency NA Accuracy ±1°F EQDP-ESE-4: p.14 (TAB E: Other(s) JUSTIFICATION/COMMENTS	·	26 of this TA maximum across drawings S880 a discussion tionship to ac	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy.	roltage is 10VD 5 on Minco Comments for ad their rela-
Load NA Frequency NA Accuracy ±1°F EQDP-ESE-4: p.14 (TAB E: Other(s)	(c)	26 of this TA maximum across drawings S880 a discussion tionship to a Parameter	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. 	roltage is 10VD 5 on Minco Comments for ad their rela- Reference
Frequency NA Westinghous Accuracy ±1°F EQDP-ESE-4: 0ther(s)	(c)	26 of this TA maximum across drawings S880 a discussion tionship to ac Parameter Voltage	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. 	roltage is 10VD 5 on Minco Comments for d their rela- <u>Reference</u>
Accuracy ±1°F EQDP-ESE-4: Other(s)	(c)	26 of this TA maximum across drawings S880 a discussion tionship to a Parameter Voltage Load	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. 	roltage is 10VD 5 on Minco Comments for ad their rela- Reference
0ther(s)	(c)	26 of this TA maximum across drawings S880 a discussion of tionship to av Parameter Voltage Load Frequency	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. 	roltage is 10VD 5 on Minco Comments for ad their rela- <u>Reference</u>
JUSTIFICATION/COMMENTS	(c)	26 of this TA maximum across drawings S880 a discussion of tionship to a Parameter Voltage Load Frequency Accuracy	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. 	Voltage is 10VD 5 on Minco Comments for 1 d their rela- Reference Westinghouse EQDP-ESE-42A
JUSTIFICATION/COMMENTS	(c)	26 of this TA maximum across drawings S880 a discussion of tionship to an Parameter Voltage Load Frequency Accuracy Other(s)	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. Demonstrated Conditions NA NA NA 21°F	Vestinghouse EQDP-ESE-42A p.14 (TAB E10
	(c)	26 of this TA maximum across drawings S880 a discussion tionship to a Parameter Voltage Load Frequency Accuracy Other(s)	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. 	Vestinghouse EQDP-ESE-42A p.14 (TAB E10
	(c)	26 of this TA maximum across drawings S880 a discussion of tionship to an Parameter Voltage Load Frequency Accuracy Other(s) JUSTIFICATION	B on response time. (2) Applied v s sensor resistance (TAB I - Note 9 and S8810. (3) See Section M(5) on insulation resistance values an ccuracy. Demonstrated Conditions NA NA NA 1°F /COMMENTS	Vestinghouse EQDP-ESE-42A p.14 (TAB E10

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K. <u>REQ</u>	UIRED OPERATING ENVIRONMENT
Ref	erence Environmental Drawing No. <u>47E235-42, (Lower Containment)</u>
(1)	Normal Max (2) Abnormal Max (a) Temperature (°F) <u>120</u> (a) Temperature (°F) <u>130</u>
	(b) Pressure (psig) <u>0.3</u> (b) Pressure (psig) <u>0</u>
	(c) Humidity (%) (c) Humidity (%)
	(d) Radiation (rd) $5.45 \times 10^7 *$ (d) Radiation (rd) <u>NA</u> (21.8 vr dose)
(3)	Process Interfaces: The RTD is in direct contact with the
	capillary instrument lines of the reactor vessel level trans-
	mitters: however, these are static lines at ambient tempera-
	ture. Therefore, there is no additional heat contribution
	from the process line over and above that of the ambient con-
·	tainment temperature.
(4)	State anticipated occurrence frequency and duration of abnorm conditions: Frequency = less than 1% of plant life; Duration
	8 hours maximum.
(5)	Accident (worst case for any combination of specified acciden parameter including peak, duration, and profile):
	(a) Temperature (°F) <u>327</u> Accident type <u>HELB/LOCA</u>
	(b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u>
	(c) Humidity (%) <u>100</u> Accident type <u>HELB/LOCA</u>
	$4 \times 10'$ gamma (d) Radiation (rd) 4.7×10^{9} beta Accident type <u>LOCA</u>
	(e) Spray Type 20 <u>00 ppm Boro</u> n, Accident type <u>HELB/LOCA</u> 0.033 Molar NaOH pH 8.3 @ 25°C for 30 days at 0.92 gpm/ft ²



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к.	REQU	IRED OPERATING ENVIRONMENT (Continued)
		Comments (duration/peak/profile/spray composition and pH,
	(6)	Is the equipment subject to moisture or liquid intrusion whican affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? Yes
		(Reference: <u>47E235-42, Note 46</u>
	(7)	Subject to submergence (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB (</u>
		Identify initiation time and duration of submergence: At the
		beginning of a LOCA and for 100 days thereafter.
	(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>WCAP-8687, supp. 2-E42A, pg. 3</u>
		If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>A beta</u>
		dose of 9 x 10 rads is equivalent to a gamma dose of 2 x 10
		rads. Since the actual plant beta dose is 4.7×10 rads, a
		$\frac{7}{\text{gamma equivalent of 2 x 10}}$ rads can be conservatively assumed
		in calculating the TID and that is reflected in the specific
		dose given in Section L(1) on page 19 of this TAB.
	(9)	Special environmental calculations (temp., rad., etc.)
		Type RIMS No.

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	PAGE <u>B-18</u>	RI

BINDER NO. <u>WBNEQ-ITE-001</u> I	PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>19</u> OF <u>2</u> R 1 R
BINDER TITLE MINCO RTD	COMPUTED GJB DATE 5/01/86 584
	CHECKED_SRP/DLK_DATE 5/08/86 Here
	12-27-88
L. <u>SUMMARY COMPARISON 01</u>	F TEST CONDITIONS TO SPECIFIED CONDITIONS
(1) Comparison of wo	orst-case maximum parameters:
Parameter	Specified Demonstrated Reference OR(1), App. D
Operating Time	<u>100 days 13 days p. 132</u> OR(1), pp. 4,1
Temperature (°F)) 327 420 $& 131-132$ OR(1), pp. 19
Pressure (psig)	<u>11.2</u> <u>75</u> <u>& 133–134</u> [F
Relative Humidit	ty $(%)$ <u>100</u> <u>100</u> <u>QR(1), p. 12</u> 2000 Boron, pH 8.35, 2750ppm Boron <u>QR(1), p. 12</u>
Chemical Spray*	0.033 M <u>olar NaOH</u> , p <u>H 10.7,24 hr</u> s <u>& TAB C</u> H 0.92 gpm/ft ² , 30 days 1.145 x 10 ⁸ gamma
Radiation (rd)**	* (See K(5 <u>)comments</u>) 1 <u>.6 x 10⁸gamm</u> a <u>QR(1), p.</u> 17
Submergence	Yes No TAB C
*Includes spray of pH. **Enter 40-year in	concentration, flowrate, density, duration, and
<pre>*Includes spray (pH. **Enter 40-year in dose and specify</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type.
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. prst-case profiles and margin assessment:
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo <u>Parameter</u></pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified (Yes/No/NA) Reference
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo <u>Parameter</u> Temperature</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. prst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u>
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo Parameter Temperature Pressure</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u> QR(1), pp. 19 <u>Yes</u> <u>& 133-134</u>
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo <u>Parameter</u> Temperature Pressure Relative Humidit</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u> QR(1), pp. 19 <u>Yes</u> QR(1), p. 12
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo Parameter Temperature Pressure Relative Humidit Chemical Spray</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u> QR(1), pp. 19 <u>Yes</u> <u>Y</u> <u>Yes</u> <u>QR(1), p. 12</u> <u>Yes</u> <u>TAB C</u> <u>Yes</u> <u>TAB C</u>
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo</pre>	concentration, flowrate, density, duration, and htegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u> QR(1), pp. 19 <u>Yes</u> <u>QR(1), p. 12</u> <u>Yes</u> <u>TAB C</u> <u>Yes</u> <u>TAB C</u>
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified (Yes/No/NA) Reference Yes TAB C QR(1), pp. 19 Yes QR(1), p. 12 Yes TAB C Yes TAB C Yes TAB C Yes TAB C Yes TAB C Yes TAB C Yes TAB C None
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo Parameter Temperature Pressure Relative Humidit Chemical Spray Submergence JUSTIFICATION/CO</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u> QR(1), pp. 19 <u>Yes</u> <u>Al33-134</u> Yes <u>TAB C</u> <u>Yes</u> <u>TAB C</u>
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo Parameter Temperature Pressure Relative Humidit Chemical Spray Submergence JUSTIFICATION/CO</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified (Yes/No/NA) Reference Yes TAB C QR(1), pp. 19 K 133-134 Y Yes QR(1), p. 12 Yes TAB C Yes TAB C Yes TAB C Yes TAB C Yes TAB C WMENTS None
<pre>*Includes spray (pH. **Enter 40-year in dose and specify (2) Comparison of wo</pre>	concentration, flowrate, density, duration, and ntegrated normal dose plus integrated accident y type. orst-case profiles and margin assessment: Test Profile Envelopes Specified <u>Yes</u> <u>TAB C</u> QR(1), pp. 19 <u>Yes</u> <u>A 133-134</u> TAB C QR(1), p. 12 <u>Yes</u> <u>TAB C</u> <u>Yes</u> <u>TAB C</u>

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BINDER TIT	LE MINCO RTD COMPUTED	28 DATE 4/1	6/86 <u> </u>
<u></u>	CHECKED	DATE 42	<u></u>
L. SUMM	ARY COMPARISON OF TEST CONDITIONS TO SPECI	FIED CONDITIO	NS (Continued)
(3)	Were margins applied to the test paramete the test program to assure that normal va accounted for? (Note margin applied, yes/	rs or otherwi riation and u no/NA)	se addressed in ncertainties are
	Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/NA
	Temperature: +15 degrees F	+93°F	YES
	Pressure: +10% but no more than 10 psig	+63psig	YES
	Radiation: +10% of accident dose	40%	YES
	Time: +10% (or 1 hour + operating time per NUREG-0588)	<u>NA</u>	NO
	Voltage: <u>+10%</u> of rated value	<u>NA</u>	NA
	Frequency: +5% of rated value	NA	NA
	Environmental Transient: the initial transient and the peak temperature applied twice	2 dwells	YES
	Vibration: +10% added to acceleration	QR(1), p.18, <u>App B & C</u>	YES
	JUSTIFICATION/COMMENTS: <u>Time Margin - See</u>	the analysis	in TAB
	<u>C2 which demonstrates qualification for t</u>	he 100 day op	erating
	time requirement.		
			<u>,</u>

	JER II	$\frac{116}{12/17} \text{GOMPUTED} \text{GJD} \text{DATE} \frac{4/10/80}{12/17}$
·		CHECKED SRP DATE 4/23/86 7451C ,2-27-88
Μ.	OPER	ABILITY TEST RESULTS
	(1)	Identify the safety function(s) of this equipment: (Reference: <u>See Sheet B-1 for Category and Operating Times</u>
		JUSTIFICATION/COMMENTS These RTDs provide temperature compe
		sation to the reactor vessel level indicators and must provi
		a continuous output during and after an accident to fulfill
		their Post-Accident Monitoring (PAM) function.
	(2)	Did the equipment perform its intended function during the simulated design basis accident exposure (Yes/No/NA)? Yes (Reference: <u>QR(1), p. 19</u>
		JUSTIFICATION/COMMENTS
	(3)	
	(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Y</u> (Reference: <u>QR(1), p. 19</u>
	(3)	Jud the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Y</u> (Reference: <u>OR(1), p. 19</u> JUSTIFICATION/COMMENTS <u>None</u>
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Y</u> (Reference: <u>OR(1), p. 19</u> JUSTIFICATION/COMMENTS <u>None</u> Did the test demonstrate the operability requirements for th required time interval for which the equipment is required t operate (Yes/No/NA)? <u>Yes</u> (Reference: <u>OR(1), p. 20 &</u>
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Y</u> (Reference: <u>OR(1), p. 19</u> JUSTIFICATION/COMMENTS <u>None</u> Did the test demonstrate the operability requirements for th required time interval for which the equipment is required t operate (Yes/No/NA)? <u>Yes</u> (Reference: <u>OR(1), p. 20 &</u> TAB C2
	(4)	<pre>Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)?_Y (Reference:QR(1), p. 19 JUSTIFICATION/COMMENTSNone Did the test demonstrate the operability requirements for th required time interval for which the equipment is required t operate (Yes/No/NA)?Yes (Reference:QR(1), p. 20 & TAB C2 JUSTIFICATION/COMMENTSNone</pre>
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Y</u> (Reference: <u>OR(1), p. 19</u> JUSTIFICATION/COMMENTS <u>None</u> Did the test demonstrate the operability requirements for th required time interval for which the equipment is required t operate (Yes/No/NA)? <u>Yes</u> (Reference: <u>OR(1), p. 20 &</u> <u>TAB C2</u> JUSTIFICATION/COMMENTS <u>None</u> Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (Yes/No/NA)? <u>Yes</u> (Reference: <u>OR(1), pp. 19-20, App. A</u>
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)?_Y (Reference:OR(1), p. 19 JUSTIFICATION/COMMENTSNone Did the test demonstrate the operability requirements for th required time interval for which the equipment is required t operate (Yes/No/NA)?Yes (Reference:OR(1), p. 20 &
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)?_Y (Reference:
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)?_Y (Reference:QR(1), p. 19 JUSTIFICATION/COMMENTSNone Did the test demonstrate the operability requirements for th required time interval for which the equipment is required to operate (Yes/No/NA)?Yes (Reference:QR(1), p. 20 &
	(4)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)?_Y (Reference:

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BINDER NO. <u>WBNEQ-ITE-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>22</u> OF <u>2</u> BINDER TITLE <u>MINCO RTD</u> COMPUTED <u>bos</u> DATE <u>4/14/86</u> <u>R</u> CHECKED <u>GS</u> DATE <u>4/22/86</u>	. <u>7</u>
M. (5) (continued) <u>Insulation resistance during the HELB test is required to remain</u> <u>greater than 500,000 ohms to guarantee a functional accuracy of</u> $\frac{+1.0^{\circ}\text{F}(QR(1),p.5)}$. The insulation resistance measurements taken <u>during the HELB test for RTDs KK-1, KK-3, KK-4, and the dummy RTD</u> <u>all had insulation resistance values of greater than 500,000 ohms</u> (QR(1),p.35). KK-2 exhibited unacceptable insulation resistance <u>due to a faulty sealing between the potting boot and the adapter</u> (QR(1),p.20). This is considered to be a random occurrence.	

These anomalies together with their resolutions have been reviewed and are considered to be adequately resolved. Therefore, the test demonstrated qualification of these RTDs.

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BINDI	ER NO. WBNEQ-ITE-001 PLAN	NTWBNUNIT(S) _	1 SHEET	OF _
BIND	ER TITLE MINCO RTD		DATE 4/16/86 R P	·
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Cap.	4/22/8t	
		CHECKED	DATE	
N.	MAINTENANCE AND SURVEILL	ANCE	· · ·	
	Has the qualification pr and inspection parameter which aid in detecting d (yes/no/NA)? YES (Enter Qualification Maintenanc	cogram identified those s is which are essential to legrading materials or eq all requirements in Sec ce Data Sheets).	urveillance, maintenance maintain qualification uipment performance tion G of the Binder -	and
	JUSTIFICATION/COMMENTS	See QMDS (TAB G).		
		<u> </u>		
		· · · · · · · · · · · · · · · · · · ·		
			· · · · · · · · · · · · · · · · · · ·	
		BACE B-22		
EQF	085.53			

BINDER TITLE MINCO RTD COMPUTED DATE 4	<u>/16/86</u>	·
O. SUMMARY OF REVIEW	Yes/No/NA	
(1) Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	YES	
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	<u>NA</u>	
(3) Choice of qualification methodology adequately justified?	YES	
(4) If analysis was performed, complete the following:(a) Were equipment performance requirements identified?	NA	
(b) Were specific features and failure modes and effects analyzed?	NA	
(c) Were assumptions and mathematical models used together with appropriate justification for their use?	NA	
(d) Were environmental parameters which affect equipment performance identified?	NA	
(5) Adequate similarity between equipment and test specimen established?	YES	
(6) Aging degradation evaluated adequately?	YES	
(a) Mechanical and/or cycle aging addressed?	NA	
(b) Equipment aged to end of life condition prior to application of DBE conditions?	YES	
(c) Absence of preaging in test/analysis justified?	_NA	
(d) Materials susceptible to thermal/radiation aging identified?	YES	

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EQP085.53

BIND	DER TITLE MINCO RTD COMPUTED D	ATE <u>4/16/86</u>
0.	SUMMARY OF REVIEW (Continued)	Yes/No/NA
	(e) Normally operating state of device (e.g., no energized) considered?	rmally <u>YES</u>
	(7) Qualified life or replacement schedule establish	ed? YES
	(8) Criteria regarding temperature/pressure exposure satisfied?	YES
	(a) Peak temperature adequate	YES
	(b) Peak pressure adequate	YES
	(c) Duration adequate	YES
	(d) Required profile enveloped adequately	YES
	(e) Steam exposure adequate	YES
	(9) Criteria regarding test sequence satisfied?	YES
	(10) Criteria regarding spray satisfied?	YES
	(a) Was the spray testing done while under the extremes of pressure and temperature?	YES
	(b) Does the spray concentration, flow rate, den duration, and pH used in tests meet or exc those to be used for the plant?	eed
	(11) Criteria regarding submergence satisfied?	YES
	(12) Criteria regarding radiation satisfied?	YES
	(a) Was dose rate considered?	YES
	(b) Was beta radiation considered?	YES
	(13) Criteria regarding operability status/mode satis	sfied? YES
	(14) Criteria regarding test failures or anomalies	YES

EQP085.53

BINDER	TITLE MINCO RTD COMPUTED DATE 4/1/186
	CHECKED DATE
0. <u>s</u>	UMMARY OF REVIEW (Continued)
(1	E) Onitonio montine functional techine tieficie 12 MBC
	5) Criteria regarding functional testing satisfied?
	(a) Does the test plan/report specify an acceptance <u>YES</u> criteria for equipment performed?
	(b) Was an initial base line test done to establish <u>YES</u> required performance characteristics?
	(c) Has the test/analysis demonstrated that performance YES performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?
(1)	6) Criteria regarding instrument accuracy satisfied? <u>YES</u>
(1	7) Test duration margin (1 hour + function time) <u>YES</u> satisfied?
	(a) Is the minimum specified operating time at least <u>YES</u> 1 hour?
	(b) If exception to the l-hour minimum operating time <u>NA</u> was taken, was adequate justification provided?
(1	8) Criteria regarding synergistic effects satisfied? <u>NA</u>
(1	9) Criteria regarding margins satisfied? <u>YES</u>
(2))) Maintenance and surveillance requirements adequately <u>YES</u> identified?
P. <u>D</u>	ISCUSSION
<u>R</u>	esponse Time - In Section 6.2 on page 14 of the test report, it
8	tates that "The RTD accuracy during testing was not verified against
a	reference standard thermometer because of differences in time
<u>r</u>	esponse, mounting location, RTD construction and local temperature
<u>v</u> .	ariations." In Section 6.3 on the same page, it states that the

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BINDER NO. <u>WBNEQ-ITE-001</u> PLANT_	WBN UNIT(S)1	SHEET 27 OF 27
BINDER TITLE MINCO RTD	COMPUTED <u>GJB</u>	DATE <u>5/23</u>	R <u>1</u> R /86 <u>F.1.17</u>
	CHECKED_SRP/DLK	DATE <u>5/27</u>	186 2494

P. <u>DISCUSSION</u> (Continued)

accuracy is established by measuring the insulation resistance and that a value of at least 500,000 ohms guarantees a functional accuracy of $\pm 1 \, {}^{\circ}$ F. These measurements were taken and reported in Table 7 on page 35 of the test report. In spite of the fact that Westinghouse makes no claims to having measured accuracy of the RTDs during the test, Figures D2 (p. 132) and D12 (p. 142) in the test report (TAB D) show the temperature profiles recorded by the average of four Type K thermocouples monitoring the test chamber temperature (p. 16) and RTD test specimen KK-4 during DBA and post-DBA conditions. When these two profiles are compared, it can be seen that they do not match during the first hour or so of the test. This indicates a much slower response time for the RTDs as compared to the thermocouples. This is not considered to be a problem because these instrument's only safety function is to provide temperature compensation to a system (RVLIS) which is required for PAM. The temperature of the water, in the sensing lines these RTDs are measuring, also will not "see" the brief transients in temperature that occur, but will heat up gradually, which renders the response time concern insignificant. Westinghouse has also taken the position that time response testing has been done successfully on a sample model of this RTD via type testing per Section 2.9 on page 8 of EQDP-ESE-42A, TAB E10.

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BINDER NO. : WBNEG-ITE. 000 HANUFACTURER : ROF PAGE 1 OF 2

PRINT DATE: 017 1789



	ANII-D	EVICE_ID-NO. Nonfl NUM	L AZMIIH_ BSB	CCATION ELEY(1) RM/RAD ÇQNIRAÇI	<u>CAI</u> (2)	QPER_TIME	EVENI	SAFEIY_EUNCIION
USN-1-TE -068-0001 -D RCS LOOP 1 HOT LEG TENP	1-TE	Usere	030	718• 6" LC 71C62-54114-1	A A A A	1000 1000 1000 1000 100 100	L MS FW CV/C RH/C	HONITORS RCS LOOP 1 HOT LEG TEMP, PAM
WBN-1-TE -068-0018 -D RCS LOOP 1 COLD LEG TEMP	1-TE	-068-0018 -D 21205	057	718• 4" LC 71 C62-54 114-1	A A A A	1000 1000 1000 1100 1100 1100	L MS FW CV/C RH/C	MONITORS RCS LOOP 1 COLD LEG TEMP PAN
WBN-1-TE -068-0024 -D RCS LOOP 2 HOT LEG TEMP	1-TE	-068-0024 -1 21205	D 153	718• LC 71 C62-54 114-1	. A A A A	100D 100D 100D 100D 1M0 1M0	L HS FW CV/C RH/C	MONITORS RCS LOOP 2 HOT LEG TEMP PAN
WBN-1-TE -068-0041 -D RCS LOOP 2 COLD LEG TEMP	1-1	E -068-0041 21205	-D 119	718• 6" LC 71C62-54114-1	A A I I	A 1000 A 1000 A 1000 A 100 A 100 A 100	L HS FW CV/ RH/	HONITORS RCS LOOP 2 COLD LEG TEMP PAM C C
WBN-1-TE -068-0043 - RCS LOOP 3 HOT LEG TEMP	E 1-1	E -068-0043 21205	-Е 203	718 5" LC 71C62-54114-1		A 1000 A 1000 A 1000 A 1000 A 140 A 140	L HS FW CV RH	MONITORS RCS LOOP 3 HOT LEG TEMP PAH /C /C

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R JUCIT 1-17=80 PREPARER/DATE_HWL 9/11/86 N. 1-1. CHECKED/DATE WCG 9/12/86 .;

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BINDER NO. : WANEQ-ITE -003 MANUFACTURER : RDF PAGE 2 OF 2

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WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

	·		CCATION				
EGIS_NUMBER QESCRIPTION	UNIT_DEVICE_10_NO NODEL_NUMB	AZUIIH_ ER	ELEV(1) BM/BAD CONIRACI	<u>Cat</u> (2)	QPER_TIME	EXENI	SAFEIY_EUNCIION
WBN-1-TE -068-0060 -E RCS LOOP 3 COLD LEG TEMP	1-те -068-0060 -ё 21205	232	713' 6" LC 71C62-54114-1	A A A A	10 OD 100D 100D 140 140	L MS FW CV/C RH/C	MONITORS RCS LOOP 3 COLD LEG TEMP PAM
WBN-1-TE -068-0065 -E RCS LOOP 4 HOT LEG TENP	1-TE -068-0065 -E 21205	330	718 6" LC 71 C62-54 114-1	A A A A	100d 100d 100d 100d 1M0 1M0	L MS FW CV/C RH/C	MONITORS RCS LOOP 4 HOT LEG TEMP <u>p</u> am
WBN-1-TE -068-0083 -E RCS LOOP 4 COLD LEG TEMP	1-TE -068-0083 -E 3 21205	308	718' 6" LC 71 C62-54 114-1	A A A A	1000 1000 1000 1000 1M0 1M0	L HS FW CV/C RH/C	MONITORS RCS LOOP 4 COLD LEG TENP PAM
•	· · ·		•			١	
· · · · ·							
PAGE							
A-2							•
			· •				R R R R R
PREFARER/DATE HWL 9/11/86							1-13-54
			CHECKED/DATE	_ <u>wc</u> G	9/12/8	6	2hel- 1-13 51
BINDER NO. <u>WBNEQ-ITE-003</u> PLANT_	WBN UNIT(S) 1 SHEET 1 OF 1						
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BINDER TITLE INSTRUMENT	COMPUTED / RI and DATE 1-12-34						
TEMPERATURE ELEMENT	CHECKED / RI HOR DATE 1-12-89						

TAB A

NOTES

- 1. Elevations shown are <u>actual</u> elevations for equipment located in the Reactor Building and <u>floor</u> elevations for equipment located outside the Reactor Building. Actual elevations for all equipment are documented in TAB F.
- See page B-1 for source of Category and Operating Times assignments.

PAGE A-3

TEMPERATURE ELEMENT	COMPUTED <u>HWL</u> DATE <u>9/11/86</u> <u>3454</u> CHECKED <u>WCG</u> DATE <u>9/12/86</u> <u>346</u> <u>74</u>
	/2-29-83
A. DOCUMENTATION	
Equipment Description	Resistance Temperature Detector (RCS Well-Mounted)
Vendor/Manufacturer	RdF
Equipment Model No.(s)	21205
QUALIFICATION REPORTS	
(1) Title/Number/Revisi cation Test Report	on <u>Equipment Qualifi-</u> RIMS <u>B45 860512</u> WCAP-8687 Supp. 2-E06A
$\frac{K_{2}}{(2)} Title/Number/Berrici$	DATE March, 1983
(2) ille/Number/Revisi	
(3) Title/Number/Perrici	DAIL
	DATE
OTHER (ANALYSIS, VENDOR	DATA, ETC.)
(1) The following docume	ntation is required to support qualifica
tion:	· · · · · · · · · · · · · · · · · · ·
a) OE Calculation W NUREG-0588 Categ	<u>BNOSG4-017 R8 Reactor Coolant System (68</u> ory and Operating Times (B45 860722 218)
b) Deleted.	
<u> c) Justification fo</u> <u> Deficiency.</u>	r HELB/LOCA Chemical Spray Qualification
d) Initiation Time Analysis Support	and Duration of Submergence Including ing Operation of Submerged RTDs.
a) Mahamial Asias (alculation Reports WAC-104 DTD 5-20-86,

	PAGE 13-1	RI
Ľ	ومتعادية والمحادثة الموادلة التواكينية والمحادثة المتحدين أأكار والمتحدية المحاد والمتراب	•

BINDER	TITLE	<u>INSTRUMENT</u>	_ COMPUTED_	HWL	DATE <u>9/11</u>	12-25-18
<u>TEMPERA'</u>	<u>rure</u>	ELEMENT	CHECKED	WCG	DATE <u>9/12</u>	2/86_2/DR
A. DOC	ument	TATION - OTHER (ANAI Instrument Accuracy (R42 860722 001)	YSIS, VENI Calculati	OOR DATA.	ETC.). (C	Continued)
	g)	Justification for A Dose.	pplied 107	Margin	of Acciden	it Radiation
(2)	In a sect qual	addition to qualific tion, the following dification is includ	ation repo documentat led in TAB	orts list ion requ D - Qual	ed on Shee ired to su ificaton I	et 1, this apport Documents.
	a)	Equipment Qualifica R5, DTD 3/83 (B45 8	tion Data 860512 366)	Package	WCAP-8587,	EQDP-ESE-6
(3)	The incl	following documenta luded in TAB E - Mis	ition requi scellaneous	ired to s Documen	upport qua ts and Cor	lification is respondence.
	a)	Design Specificatio	m 955322 F	13, DTD 8	/10/82 (B4	5 851210 351)
	b)	Design Specificatio (B45 850423 359).	m 955270 F	l2, dated	6/4/84	
	c)	Specification for R 325-04210 Rl, dated	leactor Coc 1 10/5/84,	plant RTD page 1 ('s Drawing B45 850425	No. WATS- 352).
	d)	Traceability of Ins mentation (Secton i WAT R3, dated March Quality Release 742	stalled RTI ncludes Au 1986, RIM 284).) to Its Iditable IS NO. B4	Qualificat Link Docum 5 860521 3	ion Docu- ment EQAL- 51 and
	e)	Letter from Westing (B71 860826 003) - which provides just bient temperature of	house to I States that ification of 200°F is). L. Kit ut Cal-No for use on file	chel dated te SEC-OSA of a max n at Westin	8-22-86 -1242-CO ormal am- ghouse.
	f)	Letter from Westing (B71 860404 002) - energy of the epoxy epoxy location in R	house to I States typ used in F TD assembl). Wilson De, manuf ATD assem Y.	dated 3-2 acturer an bly. Also	7-86 d activation deontes
	g)	EN DES Calculations (NEB 811125 267).	: Maximum (Containme	nt Water I	evel Rise

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BINDER NO.	VBNEQ-ITE-003 PLANT WBN UNIT(S) 1 SHEET 3 OF 37
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TEMPERATURE	<u>ELEMENT</u> CHECKED WCG DATE <u>9/12/86</u> /2-29-89
A. DOCUMEN	VTATION - OTHER (ANALYSIS, VENDOR DATA, ETC.), (Continued)
h)	TVA Drawings
	 a) Conduit and Grounding Penetration Sealing and Fire Stop Details, DWG 45W883-3 R15.
	b) Conduit and Grounding Floor EL 716.0 Details, Sheet 17, DWG 45W862-19 R22.
i)	Traceability of Installed Thermowell.
(4) Wes A11	stinghouse's Drawings 5365C29 R1, 271C315 R3 and 206C470 R5; R1 l incorporated in TAB I.
NOTE:	Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the binder. R1 This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder reference.
	constacted a comprete fisting of binder felefences.

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BINDER NO. <u>WBNEQ-ITE-003</u> PLANT BINDER TITLE <u>INSTRUMENT</u> TEMPERATURE ELEMENT	WBN UNIT(S) 1 SHEET 4 OF 37 COMPUTED DATE R COMPUTED DATE R CHECKED DATE
 B. <u>CONCLUSION OF REVIEW</u> (Ch X Equipment Qualifi Equipment Satisfi Justification o Equipment Qualifi Equipment Not Qua OPEN ITEMS AND QUALIFICATI section, for open items an 	eck only one block) ed (Pending Resolution of Open Items) es All Requirements Except Qualified Life or f Replacement Schedule cation Not Established by Documentation lified Based on Test Failures ON DEFICIENCIES <u>Refer to Sheet 5, this</u> <u>d qualification deficiencies.</u>
COMMENTS/RECOMMENDATIONS	
	PAGE B-4

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BINDER NO. WBNEQ-ITE-003 PI	ANT WBN	UNIT(S) <u>1</u>	
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B. <u>CONCLUSION OF REVIEW - Open Items and Qualification Deficiencies</u>

(1) Relocation of junction boxes for 1-TE-68-1, -18, -24, -41, -43,

-60, and -83 above postulated flood level. Reference

SCR WBNEEB8559/ECN5993.

(2) Binder Open Item WBNEQP8621 Rl, (B45 860717 851) which requires

review of Westinghouse's PAM Functional Requirements Document

(B45 860122 351) to determine its adequacy for use in

demonstrating qualification of the RCS wide range RTDs.

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C.	QUALIFI	ATION_CRITERIA		<u> </u>			· · · · · · · · · · · · · · · · · · ·	
5	Criteria Followin	Used to Demons g (Indicate Whi	strate Qua Ich Criter	lification i ia is Applic	s in A able):	ccordanc	e with th	le
	<u> </u>	Components are and/or NUREG-05	Qualified 88 Catego	to the Crit ry I (IEEE32	eria o 3-1974	f 10CFR5	0.49	
		Components are Category II or OlB (IEEE323-19	Qualified the DOR G 971) (DOR	to the Crit uidelines of Guidelines A	eria o lE Bu pplica	f NUREG- lletin N ble to o	0588 o. 79- nly BFN)	
	JUSTIFI	ATION/COMMENTS						-
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				-				
	INDICATI	OTHER REGULATO	DRY DOCUME	NTS AND/OR I	NDUSTR	Y STANDA	RDS MET	
	INDICATI	OTHER REGULATO	ORY DOCUME	NTS AND/OR I	NDUSTR	Y STANDA	RDS MET	_
	INDICATI	OTHER REGULATO)RY DOCUME	NTS AND/OR I	NDUSTR	Y STANDA	RDS MET	
	INDICATI	OTHER REGULATO	DRY DOCUME	NTS AND/OR I	NDUSTR	Y STANDA	RDS MET	
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		OTHER REGULATO	DRY DOCUME	NTS AND/OR I	NDUSTR	Y STANDA	RDS MET	
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 D. <u>QUALIFICATION METHODOLOGY</u> (Check only one block) X Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis Test of Similar Items with Supporting Analysis Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis JUSTIFICATION/COMMENTS The installed RTDs are identical to those tested. Refer to TAB E, Section 4, for traceability. During HELE simulation tests, RTDs were subjected to chemical spray from start of test to 24 hours. Flow rate was not specified. RTDs are required to operate for 100 days following a LOCA or line breaks in either MS or FW lines. Refer to TAB C, Section 5, for accept
ability. RTDs are subject to submergence following a DBE. During HELB simulation tests, RTDs were not tested to demonstrate qualification
for submergence. For analysis supporting operation of submerged
RIDs, refer to TAB C, Section 6.
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TVA 19537 (OE-3-86)

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TEMPERAT	URE ELEMENT	CHECKEDW	<u>CG</u> DATE <u>6/1</u>	2/86 <u>3454</u> 12-29-88
E. <u>EQU</u>	IPMENT DESCRIPTION			
Is ide (Ye	the equipment identi entical to the plant es/No/NA)? <u>Yes</u>	fied in the qua equipment which	lification docu requires quali:	mentation fication
		<u>Plant Device</u>	Qualification	Referen
(1)	Equipment Type	Resistance Temperature Detector	Same	(1)
(2)	Manufacturer	RdF	Same	(1)
(3)	Model Number(s)	21205	21205	<u>Tbl l,</u>
	· · · · · ·		<u> </u>	
(4)	Serial Number(s)	417, 418,	103. 114.	Tb1 1,
		419, 420,	115	
		421. 422.		<u></u>
		423. 424		<u></u>
(5)	Identify Component Unique checksheet attached:			
JUS	TIFICATION/COMMENTS			
(1)	Qualification Report	WCAP-8687, Supp	2-E06A	
		· · · · · · · · · · · · · · · · · · ·		

BINDER NO.WBNEQ-ITE-003 PLANT_	<u>WBN</u> UNIT(S) <u>1</u> SHEET <u>9</u> OF <u>37</u>
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F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification documentation and/or evaluation and reference the source. Is the interface a requirement for our application (Yes/No)? (Note below.) If yes, enter requirement in QMDS, if no, provide justification.

	Plant	
	Requirement?	Reference
<u>Identify Interface</u>	(Yes/No)	<u>Test Report</u>
NA		
<u>NA</u>		
NA		
Nuclear qualified		
splice (1)	Yes	<u>G-38 (2)</u> R1
NA		
NA		
NA		
(3)(4)	Yes	(5)
	Identify Interface NA (3)(4)	Plant Requirement? Identify Interface (Yes/No) NA

JUSTIFICATION/COMMENTS

(1) RTD cable assembly interfaces with a Conax seal and electrical connections are made within the Conax seal (Refer to TAB E, Section 8, TVA drawings 45W883-3, Detail F3 and 45W862-19, Detail F19). |R1 Environmental qualification of Conax seal is documented in EQ Binder WBNEQ-CSC-001. Environmental qualification of splice is documented in EQ Binder WBNEQ-SPLC-001. |R1

(2) Qualification Report WCAP-8687, Supp 2-E06A, Para 7.1, pp 17 |R1 and 18.

(3) The RTD cable must be seismically supported to maintain seismic qualification. For seismic installation requirements, refer to TAB I, DWG 2650C31, Note 1.

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BINDER NO.WBNEQ-ITE-003 PLANT_	WBN UNIT(S) 1 SHEET 9A OF	<u> </u>
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JUSTIFICATION/COMMENTS (Continued)

- (4) Installation requirements are per Westinghouse drawings RCS Cold Leg RTD Installation Details (Well Type), drawing no. 5365C29 (Refer to TAB I, Section 1). RTD to be used with |R1 thermowell as specified on Westinghouse drawing Installation Details Thermowell with Boss, drawing no. 271C315 (Refer to |R1 TAB I, Section 2).
- (5) Equipment Qualification Data Package EQDP-ESE-6, Paragraph |R1 1.2, page 2.



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G. <u>TES</u> I	<u>C SEQUENCE</u>		
(1)	Test Sequence: Was the test sequence the accident environment in accordan paragraph 6.3.2 (Yes/No/NA)? (Note 2.9, p 9 (1)	e establisi ace with IE below.) Re:	hed to simulate EE-323 (74), fer to Para
		Yes/No/NA	Reference
	(a) Equipment inspected for damage	Yes	<u>Para 2.9, p 9 (1)</u>
	<pre>(b) Baseline performance measurements taken</pre>	Yes	Appx C, pp 58, 59, 60 ⁽²⁾
	(c) Equipment aged: ⁽⁴⁾		
	Thermal	Yes	<u>Para 5.1, p 10⁽²⁾</u>
	Radiation	Yes	Paras 5.3, 5.4 pp 10, 11 (2)
	Wear	Yes	<u>Para 3.2, p 5⁽²⁾</u>
	(d) Vibration/seismic testing conducted	Yes	Paras 5.5, 5.6 pp 11 thru 14 ⁽²⁾
	<pre>(e) Design basis event (DBE) exposure</pre>	Yes	<u>Para 5.7, p 1</u> 4 ⁽²⁾
	(f) Post-DBE exposure	Yes	<u>Para 5.7, p 1</u> 4 ⁽²⁾
	(g) Final inspection and disassembly	(3)	(3)
(2)	Was the same piece of equipment used sequence described in item (1) above	throughout (Yes/No/NA	t the test A)? <u>Yes</u>
(3)	Have the test equipment, test equipm calibration data been appropriately	ent accurad document ()	cies and (5) Kes/No/NA)? <u>Yes</u>
	(Reference: <u>Tbl II, pp 21 thru 24</u> (2	.)).
SUL	TIFICATION/COMMENTS (1) Equipment Qua	lification	Data Package
FOT	P-ESE-6.		R1

BINDER 7	TITLE	INSTRUMENT	COMPUTED_	HWL	DATE 6/27/86 wer	
TEMPERAT	URE	ELEMENT	CHECKED	WBK	DATE 7/3/86 2000 2-29-88	<u></u>
G.	TES	I SEQUENCE - Justi	fication/Co	omments (Continued)	
	(2)	Qualification Rep	ort WCAP-86	687, Supp	. 2-EO6A.	
5	(3)	RTDs were subject ment Qualificatio pp 9 & 10) and we formance tests (R Supp 2-E06A, Appx	ed to final on Data Pack are subjecte afer to Qua t C).	l inspect tage EQDP ed to pos alificati	ion (Refer to Equip- -ESE-6, Para 2.9, t-qualification per- on Report WCAP-8687,	-
	(4)	RTDs were subject fication Report W	ed to therm CAP-8687, S	al cycli Supp 2-EO	ng (Refer to Quali- 6A, Para 5.2, p 10).	
	(5)	Calibration Data available for aud	and Test Eq it at Westi	uipment nghouse.	Accuracies are	
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TEMP	ERATU	RE ELEMENT CH	ECKED <u>WBK</u>	DATE <u>7/</u>	<u>3/86</u> /DR 12:24-88
H.	AGIN	G			
	(1)	Was aging considered in (Yes/No/NA)? <u>Yes</u> (R	the qualifi eference:	cation progr Qualificatio	am n_Report
		WCAP-8687, Supp 2-E06A,	<u>Para 3.1, p</u>	3	
		JUSTIFICATION/COMMENTS	<u>.</u>	,,,	
	(2)	Were the following effec	ts consider	ed in the ag	ing program:
		Aging Effect		<u>Yes/No/NA</u>	Reference
					Para 3.1.1,
		Thermal aging		Yes	<u>p 3 (1)</u>
		Radiation exposure		Yes	Para $3.1.3$, (1) 3.1.4, p 4 Para $3.1.5$,
		Vibration (non-seismic)	aging	Yes	<u>p 4</u> (1)
		Operational (electrical/ process) stress aging	mechanical/	Yes	Para 3.1.2, p Para 3.1.5, p
		JUSTIFICATION/COMMENTS	Qualificati	on Report WC	AP-8687, Supp
		<u>2-E06A.</u>			
	(3)	Were all known synergist significant effect on eq aging program (Yes/No/NA	ic effects uipment per)? <u>NA</u>	which are be formance con _ (Referenc	lieved to have sidered in the e:
		JUSTIFICATION/COMMENTS construction, no known s ment.	<u>Based upon</u> ynergistic	review of ma effects appl	<u>terials of</u> y to this equi
	(4)	Thermal Aging:			
		(a) Was thermal aging constant (Yes/No/NA)? <u>Yes</u> WCAP, Supp 2-E06A,	onsidered i (Referenc Para 3.1.1,	n the qualif e: <u>Qualific</u> p 3 and Par	ication progra <u>ation Report</u> a <u>5.1, p 10</u>)
		JUSTIFICATION/COMME	NTS		· · · · · · · · · · · · · · · · · · ·

TEMPERATURE E	$\begin{array}{c} \underline{\text{INSTROMENT}} & \underline{\text{CONTUTED}} & \underline{\text{NNE}} & \underline{\text{DATE}} & \underline{\frac{5727760}{7229}} \\ \underline{1229} + \underline{9} & \underline{1229} + \underline{9} \\ \underline{1229} + \underline{9} & \underline$
H. <u>AGING</u> (Co	ntinued)
(b)	Were the materials susceptible to thermal aging degradation identified in the qualification program (Yes/No/NA)? Yes (Reference: Qualification Report WCAP-8687, Supp 2-E06A, Para 3.1.1, p 3).
(c)	JUSTIFICATION/COMMENTS Was the basis for thermal aging identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference:
	Equipment Qualification Data Package EODP-ESE-6, Para 1.9, p 4; Qualification Report WCAP-8687, Supp 2-EO6A, Para 5.1, p 10).
(d)	JUSTIFICATION/COMMENTS Was the aging acceleration rate justified and the paramete of time and temperature identified in the qualification program (Yes/No/NA)? Yes (Reference: Qualification
	Report WCAP-8687, Supp 2-E06A, Para 5.1, p 10ParameterPlant Maximum NormalTestEquivalentTemperature $200^{\circ}F^{(1)}$ $400^{\circ}F^{(2)}$ $200^{\circ}F^{(3)}$
	Time <u>40 years</u> <u>11 days >40 years</u> JUSTIFICATION/COMMENTS $(1)(2)(3)$ Refer to Sheet 14, this
(e)	Was the Arrhenius methodolgy used for accelerated aging (Yes/No/NA)? <u>Yes</u> (Reference: <u>Equipment Qualification</u>
	Data Package EODP-ESE-6, Para 1.9, p 4).
(f)	If activation energies were used for determining accelerat aging parameters, are they properly referenced to the sour of the technical data (Yes/No/NA)? <u>No</u>
	(Reference: (4) Refer to Sheet 14, this tab JUSTIFICATION/COMMENTS

BI	DER NO. <u>WBNEQ-ITE-003</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>14</u> OF <u>37</u>
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TEN	PERATURE ELEMENT CHECKED WCG DATE 9/12/86 1000 12-29-88
E	AGING
	(4) Thermal Aging (Continued)
	 (d) (1) The plant maximum normal for RTDs 1-TE-68-1, -18, -24, -41, -43, -60, -65, -83 is 200°F. Westinghouse has performed an analysis which shows that the air velocity and ambient temperature of the area in which the RTDs are located are sufficient to limit the temperature of the RTDs head to approximately 200°F. Analysis, Cal-Note SEC-OSA-1242-CO, is on file at Westinghouse - Refer to TAB E, Section 5.
	Qualification Report WCAP-8687, Supp 2-E06A, Para 5.1, R
	<pre>(3) Material Aging Calculation WAC-104, Refer to TAB C, Section 7.</pre>
	(4) (f) The activation energy used is denoted in Para 3.1.1, p 3 of Qualification Report WCAP-8687, Supp 2-E06A. R Also refer to TAB E, Sect 6 - Letter from Westinghouse to D. Wilson dated March 27, 1986 (B71 860404 002).
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<u>TEMPERATURE E</u>	LEMENT CHECKED WBK DATE 6/12/86 2407C
H. <u>AGING</u> (Co	ntinued)
(g)	If a regression line was used for determining accelerated aging parameters, are test points or failure modes identified on the line (Yes/No/NA)? <u>NA</u> (Reference:).
	JUSTIFICATION/COMMENTS
(h)	Was the equipment operated during the thermal aging (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report</u>
	WCAP-8687, Supp 2-E06A, Para 3.2, p 5). R1
- -	JUSTIFICATION/COMMENTS
(5) Radi	ation Aging Exposure:
(a)	Was radiation aging exposure considered in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification</u>
	Report WCAP-8687, Supp 2-E06A, Para 3.1.3, 3.1.4, p 4 and R1
· ·	Para 5.3, 5.4, pp 10, 11).
•	JUSTIFICATION/COMMENTS
(b)	Were the materials susceptible to radiation degradation identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report WCAP-8687, Supp 2-E06A</u> R1
	Para 3.1.1, p 3).
	JUSTIFICATION/COMMENTS
 (c)	Was the basis for radiation aging exposure identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>See comments</u>).
	JUSTIFICATION/COMMENTS Design Specification 955270, Para R1
	6.2, p 6. Refer to TAB E, Sect 2: Qualification Report
	WCAP-8687, Supp 2-E06A, Para 3.1.3, 3.1.4, p 4. [R1

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<u>TEMPERATURE EL</u>	EMENT CHECKED W	CG DATE <u>9/12/86</u> 12:29:88
H. <u>AGING</u> (Co	ntinued)	•
(d)	Is the radiation test exposu acceptable (Yes/No/NA)? <u>Yes</u> <u>Qualification Report WCAP-86</u> pp 10, 11	re dose and dose rate (Reference:
	Plant normal ambient radiati dose (rd)	on $\frac{7}{8 \times 10}$
		Tip of RTD 2.47 x $10^{8(1)}$
	Test exposure dose (rd)	$\frac{\text{Cable 1.22 x 10}^8}{6(2)}$
		Between 2×10^{6}
	Test exposure dose rate (rd/	hr) <u>and 3 x 10</u>
	Test exposure source type (e.g., Co-60 gamma)	(2) <u>Co-60 Gamma</u>
	JUSTIFICATION/COMMENTS $\frac{(1)}{0}$	ualification Report WCAP-8687,
	Supp 2-E06A, Para 5.3, pp 10	, 11. (2) Design Specifica-
	tion 955270. Para 6.2. p 6 (refer to TAB E. Sect 2)
(6) Vibr	ation (non-seismic) Aging:	•
(a)	Were the effects of non-seis normal and abnormal operation qualification program* (yes/ (Reference <u>Qualification Re</u> Para 3.1.5, p 4 and Para 5.5	mic vibration induced during n addressed in the no/NA)? <u>Yes</u> port WCAP-8687, Supp 2-EO6A, R , pp 11 thru 13).
	JUSTIFICATION/COMMENTS	······
(b)	Was the basis for vibration in the qualification program (Reference: <u>Qualification Re</u> Para 3.1.5, p 4 and Para 5.5	aging identified and justified (Yes/No/NA)? <u>Yes</u> port WCAP-8687, Supp 2-E06A R , pp 11 thru 13.).
	JUSTIFICATION/COMMENTS	
* Qualific document	ation program refers to the t ation including TVA analyses	est report and any supplemental in Tab C of the binder.
L	DAGE R-17	RI

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	H. <u>Agin</u>	<u>G</u> (Continued)				
	(7)	Operational Stress A	ging:			·
	4	(a) Were the effect operational str operation adres (Yes/No/NA)? <u>Y</u>	s of electri esses induce sed in the c es (Refere	.cal, med ed during qualifica ence: Qu	chanical, g normal a ation prog malificati	and process nd abnormal ram on Report
		WCAP-8687, Supp	<u>. 2-E06A. Pa</u>	ira 3.1.2	2 <u>, p 3, an</u>	d Para 5.2, F
		p 10		<u></u>	<u></u>) <u>.</u>
		JUSTIFICATION/C	OMMENTS	- <u></u>	<u></u>	
		(b) Was the basis f aging identifie program (Yes/No	or stresses d and justif /NA)? <u>Yes</u>	induced ied in t (Refer	during op the qualif tence: <u>Qu</u>	erational ication alification
		Report WCAP-868	7, Supp. 2-E	06A, Par	a 3.1.2.	<u>p 3).</u> R
		JUSTIFICATION/C	OMMENTS			
	(8)	Was the qualified li in the qualification (Reference: <u>Qualifi</u>	fe of the eq program (Ye cation Repor	uipment s/No/NA) t WCAP-8	and its b)? <u>Yes</u> 3687, Supp	asis defined
		3.1.1, p 3, and Para	5.1. p 10.	Equipme	mt Qualif	ication
	<i>.</i>	Data Package EODP-ES	<u>E-6. Para 1.</u>	9. p 4). R
		Qualified life (Docu	ment in QMDS	;) <u>> 40</u>	<u>vears</u>	
		JUSTIFICATION/COMMEN	TS			
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н. <u>Ас</u>	ING (Continued)	······································		
(9) Were replacement inter defined in the qualifi	vals for the eq cation program	uipment or it (Yes/No/NA)?	s componer Yes
*	(Reference: <u>See comme</u>	nts		
	JUSTIFICATION/COMMENTS	Qualified life ent Qualification	e of test spe on Data Packa	cimen is 1 ze EODP-ES
,	<u>6, Tbl 1, p 18).</u>			<u></u>
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BINI	ER TITLE INSTRUMENT	COMPUTED	HWL	DATE <u>5/28/8</u>	5 <u>.</u> wc.7
TEMP	ERATURE ELEMENT	CHECKED	WBK	DATE <u>6/12/8</u>	12-29-88
I.	MATERIALS ANALYSIS	e Succenti	ible to Si	ignificant T	hermal
	and/or Radiation Degradati for Detailed Materials Ana	on and Agi	ing (Use S	Section C of	Binde
	Material/ Property/Function	Radiation <u>Threshold</u>	Reference	Activation	Refer
	Silicon Varnish (a) <u>(Cable Coating)</u>	NA ⁽¹⁾	(1)	Not (2) Specified	Para (3 <u>p 3</u> Para
	(b) <u>Epoxy (Potting Matl)</u>	(1)	(1)	.98eV	3 (ع <u>1</u> 3 ع
	(c) (d)		- <u></u>	- <u> </u>	
	(e)				
	JUSTIFICATION/COMMENTS $\frac{(1)}{2}$ rads gamma and 9.23 x 10	.) <u>Materials</u> rads beta	were ir	adiated to	l.22 x
	(refer to Qualification Re	port WCAP-	-8687, Sur	op 2-E06A. Pa	aras 5
	5.4, pp 10, 11). (2) The silicon varnish is	only used	as a manu	ifacturing p	cocess
	prevent the fiberglass ins	ulation of	the cabl	e from fray:	ing du
	manufacturing and is not r (3)	equired fo	or operati	ion of the R	rD.
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TEMPERATI	IRE ELEMENT CHECKED WBK DATE 6/12/86 1/2/89 /2-29-89
J. EQUI	TEMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE
(1)	Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (Yes/No/NA)? <u>Yes</u> (Reference: <u>Equipment Qualification Data Package EQDP-ESE-6</u> , Sect. 1.7. p 3; Qualification Report WCAP-8687, Supp 2-E06A, Para 3.2, p 5, and Para 6.3, p 16)
	Identify Acceptance Criteria: $\pm 0.2^{\circ}$ F repeatability, $\pm 1.0^{\circ}$ F drift allowance: insulation resistance > 1 Megohm.
(2)	Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report WCAP-8687, Supp. 2-E06A,</u> Para 3.2, p 5) Identify baseline and functional testing: <u>Refer to Sheet 21</u> ,
	<u>this tab.</u>
	JUSTIFICATION/COMMENTS
(3)	Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (Yes/No/NA)? <u>NA</u> (Reference: <u>Equipment Qualification Data Package EQDP-ESE-6</u> ,
	Para 1.1. p 2)
	Sheet 21, this tab.

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BINDER NO.WBNEQ-ITE-003 PLANT_	WBN UNIT(S) <u>1</u> SHEET <u>21</u> OF <u>37</u>
BINDER TITLE INSTRUMENT	$\frac{R_{-}}{R_{-}} R_{-}$
TEMPERATURE ELEMENT	CHECKED WBK DATE //3/86 77942 /2-29-88

J. EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS

(2) Performance Characteristics (Continued)

Baseline Functional Tests (Operation - Normal Condition) are described in the Equipment Qualification Data Package EQDP-ESE-6, [R1 Para 2.9, p 9. For baseline functional test results and functional test (static calibration) results performed after each of the test phases, refer to Qualification Report WCAP-8687, Supp 2-E06A, Appx [R1 C, pp 57 thru 61.

(3) During static calibration checks, the RTDs were excited by a constant current (approximately 1 mA; refer to Equipment Qualification Data Package EQDP-ESE-6, Para 1.1, p 2) applied to the two R1 leads while the voltage drop was measured across the other two leads. A digital voltmeter was used to measure resistance. Refer to Qualification Report WCAP-8687, Supp 2-E06A, Para 4.2.1, p 7, R1 and Fig. 4, p 32. During each of the test phases, the RTD outputs were monitored via Westinghouse 300 series amplifiers. The 0-10-Volt analog outputs of the amplifiers were monitored and recorded on a digital data logger. Refer to Qualification Report WCAP-8687, Supp 2-E06A, Para 4.2.2, 4.2.3, R1 4.2.4, 4.2.5, and 4.2.6, pp 7 thru 9.

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<u></u>	PERATU	<u>re ei</u>	LEMENT	CHECKED <u>WCG</u> DA	HDP/Rum
J.	EQUI PERF	PMENT ORMAN	C ELECTRICAL	CHARACTERISTICS NECESSARY TIONS CAN BE SATISFIED UNI	<u>TO ENSURE THE</u> DER ACCIDENT CONDITIO
	(4)	Do toper	the applied l cating condit	oads during baseline testi ions (Yes/No/NA)? <u>NA</u> (ing reflect normal Reference: <u>Refer to</u>
		<u>J.(3</u>	3), Sheet 21,	this tab	
		JUSI	CIFICATION/CO	MMENTS	
		- <u></u>		······································	······································
				· · ·	
	(5)	Iden equi	ntify electri ipment perfor	cal characteristics necess mance specifications can b	ary to ensure the satisfied.
		(a)	Parameter	Plant Normal Conditions	Reference
			Voltage	R/I Converter with <u>1-milliamp current</u>	(1)
			Load	NA	(1)
			Frequency	<u>NA</u>	(1)
			Accuracy	± 26.2°F	TAB C. Section
			Other(s)		
,					
			JUSTIFICATI	ON/COMMENTS (1) Equipment	Qualification Data
			<u>Package EQD</u>	P-ESE-6, para. 1.1, p. 2.	
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	TLE <u>INSTRUME</u>	NT COMPUTED_ HWL DATE 9/1	11/86 4.23
<u>remperati</u>	IRE ELEMENT	CHECKED WCG DATE 9/2	2/86 HDR/RHM
J. <u>EQUI</u> <u>PERI</u> (Cor	IPMENT ELECTRI FORMANCE SPECI	CAL CHARACTERISTICS NECESSARY TO EN FICATIONS CAN BE SATISFIED UNDER ACC	SURE THE CIDENT CONDITION
(b)	Parameter	Specific Accident Conditions	Reference
	Voltage	R/I Converter with <u>1-milliamp current</u>	<u>(1)(2)</u>
	Load	<u>NA</u>	(1)
	Frequency	<u>NA</u>	(1)
	Accuracy	$\pm 21^{\circ}F^{(3)}$	(4)
	Other(s)		
		· · · · · · · · · · · · · · · · · · ·	
		(2)	ion Data
	Package EODP- Drawing 47W6 resolution of	-ESE-6, Para 1.1, p. 2. (2) Electric (3) 10-68-1, -2, -3, and -4. (4) f SCR WBNEQP8621. (4) Instrument Acc	control control cem pending curacy Calcu-
	Package EODP- Drawing 47W6 resolution of lation WBPEO6	-ESE-6, Para 1.1, p. 2. (2) Electric 10-68-1, -2, -3, and -4. (3) f SCR WBNEQP8621. (4) Instrument Acc 688605005, p. 36 (refer to TAB C, Se	control contro
(c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter	-ESE-6, Para 1.1, p. 2. (2) Electric 10-68-1, -2, -3, and -4. (3) Open It (4) Instrument Acc 688605005, p. 36 (refer to TAB C, Se Demonstrated Conditions_	Control Control Control Curacy Calcu- Curacy Calcu- Control 8). Reference
(c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter Voltage	-ESE-6, Para 1.1, p. 2. (2) Electric (3) (3) (4) Instrument Acc (4) Electric (4) Instrument Acc (688605005, p. 36 (refer to TAB C, Se Demonstrated Conditions R/I Converter with 1 - milliamp current	Control Control Control Curacy Calcu- Curacy Calcu- Ection 8). Reference
. (c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter Voltage Load	-ESE-6, Para 1.1, p. 2. (2) -ESE-6, Para 1.1, p. 2. (3) 10-68-1, -2, -3, and -4. Open It f SCR WBNEOP8621. (4) f SCR WBNEOP8621. Instrument Acc 688605005, p. 36 (refer to TAB C, Se Demonstrated Conditions R/I Converter with 1 - milliamp current NA	ion Data <u>Control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u>control</u> <u></u>
. (c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter Voltage Load Frequency	-ESE-6. Para 1.1. p. 2. (2) -ESE-6. Para 1.1. p. 2. (3) 10-68-123. and -4. Open It (4) f SCR WBNEQP8621. Instrument Acc 688605005. p. 36 (refer to TAB C. Se 	ion Data : Control :em pending :uracy Calcu- ection 8). <u>Reference</u> (1) (1) (1)
· (c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter Voltage Load Frequency Accuracy	-ESE-6, Para 1.1, p. 2. (2) -ESE-6, Para 1.1, p. 2. (3) 10-68-1, -2, -3, and -4. Open It f SCR WBNEQP8621. Instrument Acc 688605005, p. 36 (refer to TAB C, Se Demonstrated Conditions R/I Converter with 1 - milliamp current NA NA + 26.2°F	ion Data : Control :em pending :uracy Calcu- ection 8). Reference (1) (1) (1) (2)
. (c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter Voltage Load Frequency Accuracy Other(s)	-ESE-6. Para 1.1. p. 2. (2) -ESE-6. Para 1.1. p. 2. (3) 10-68-123. and -4. Open It (4) f SCR WBNEOP8621. Instrument Acc 688605005. p. 36 (refer to TAB C. Se 	ion Data : Control :em pending :uracy Calcu- ection 8). Reference (1) (1) (1) (2)
· (c)	Package EODP Drawing 47W6 resolution of lation WBPEOG Parameter Voltage Load Frequency Accuracy Other(s)	-ESE-6. Para 1.1. p. 2. (2) -ESE-6. Para 1.1. p. 2. (3) 10-68-123. and -4. Open It (4) Instrument Accord 688605005. p. 36 (refer to TAB C. Set	ion Data : Control :em pending :uracy Calcu- ection 8). Reference (1) (1) (1) (2) ion Data Pack-

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PAGE B-2-/ R1

BINDER NO.WBNEQ-ITE-003 PLANT	WBN UNIT	(S) <u>1</u> SHEET <u>24</u> 0F <u>37</u>
BINDER TITLE INSTRUMENT	COMPUTED <u>HWL</u>	R_/ R DATE 9/11/86 44CP
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J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE</u> <u>PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS</u>

(5)(b) Demonstrated Conditions

Accuracy - There are no changes in the RTD due to severe evnvironments. The calibration accuracy is ± 0.2 , F and the drift allowance is ± 1.0 , F (refer to Equipment Qualification Data Package EQDP-ESE-6, Tbl 1, p 18, and to Qualification Report WCAP-8687, Supp 2-E06A, R1 Para. 7.2, p 18). For demonstrated loop accuracy of ± 26.2 , F, refer to Instrument Accuracy Calculations, TAB C, Section 8.

PAGE B-25 RI

 K. REQUIRED OPERATING ENVIRONMENT Reference Environmental Drawing No. 47E235-42 (1) Normal Max (2) Abnormal Max (a) Temperature (*F) 120⁽¹⁾ (b) Pressure (psig) .3 (c) Humidity (%) 80 (c) Humidity (%) 80 (c) Humidity (%) 80 (d) Radiation (rd) 8 x 10⁷ (e) State anticipated occurrence frequency and duration of abnoconditions: Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (*F) 327⁽¹⁾ (b) Pressure (psig) 11.2 (c) Humidity (%) 100 (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA/HE 4.7 x 10⁸ beta (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA/HE 4.7 x 10⁸ beta 		RATU	<u>RE ELEMENT</u> CHECKED <u>WCG</u>	DATE <u>9/12/86</u> / 7/9//_ /2-29-88
Reference Environmental Drawing No. <u>47E235-42</u> (1) Normal Max (2) Abnormal Max (a) Temperature (*F) <u>120⁽¹⁾</u> (a) Temperature (*F) <u>11</u> (b) Pressure (psig) <u>.3</u> (b) Pressure (psig) <u>.1</u> (c) Humidity (%) <u>80</u> (c) Humidity (%) <u>10</u> (d) Radiation (rd) <u>8 x 10⁷</u> (d) Radiation (rd) <u>NA</u> (3) Process Interfaces: <u>NA: RTDs are installed in thermowells</u> . For effects of process temperatures, refer to Sheet 26, thi TAB. (4) State anticipated occurrence frequency and duration of abno conditions: <u>Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (*F) <u>327⁽¹⁾</u> Accident type <u>HELB</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA/HE</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> (d) Radiation (rd) <u>4 x 10⁷ gamma</u> Accident type <u>LOCA/HE</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u> </u>	K.	<u>REQU</u>	IRED OPERATING ENVIRONMENT	
 (1) Normal Max (2) Abnormal Max (a) Temperature (*F) 120⁽¹⁾ (b) Pressure (psig) .3 (c) Humidity (%) 80 (c) Humidity (%) 80 (d) Radiation (rd) 8 x 10⁷ (e) State anticipated occurrence frequency and duration of abnormal temperature. pressure. and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (f) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (*F) 327⁽¹⁾ Accident type HELB (b) Pressure (psig) 11.2 Accident type LOCA (c) Humidity (%) 100 Accident type LOCA (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA/HE (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA/HE (e) Spray Type Boron⁽²⁾ 		Refe	rence Environmental Drawing No. <u>47E235-4</u>	2
 (a) Temperature (*F) 120⁽¹⁾ (b) Pressure (psig) .3 (b) Pressure (psig) .1 (c) Humidity (%) 80 (c) Humidity (%) 10 (d) Radiation (rd) 8 x 10⁷ (e) State anticipated occurrence frequency and duration of abno conditions: Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (*F) 327⁽¹⁾ (b) Pressure (psig) 11.2 Accident type HELB (b) Pressure (psig) 11.2 Accident type LOCA (c) Humidity (%) 100 Accident type LOCA/HE (d) Radiation (rd) 4 x 10⁷/₈ gamma Accident type LOCA/HE (e) Spray Type Boron⁽²⁾ Accident type LOCA/HE 		(1)	Normal Max (2) Abnor	mal Max
 (b) Pressure (psig) .3 (b) Pressure (psig) .3 (c) Humidity (%) 80 (c) Humidity (%) 10 (d) Radiation (rd) 8 x 10⁷ (d) Radiation (rd) Mg (3) Process Interfaces: NA: RTDs are installed in thermowells. For effects of process temperatures, refer to Sheet 26, this TAB. (4) State anticipated occurrence frequency and duration of abno conditions: Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) 327⁽¹⁾ Accident type HELB (b) Pressure (psig) 11.2 Accident type LOCA (c) Humidity (%) 100 Accident type LOCA/HE 4.7 x 10⁸ beta (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA/HE 10CA (e) Spray Type Boron⁽²⁾ Accident type LOCA/HE 	÷		(a) Temperature (°F) <u>120 (a)</u> (a)	Temperature (°F) <u>13</u>
 (c) Humidity (%) <u>80</u> (c) Humidity (%) <u>10</u> (d) Radiation (rd) <u>8 x 10</u> (d) Radiation (rd) <u>N4</u> (3) Process Interfaces: <u>NA: RTDs are installed in thermowells</u>. For effects of process temperatures, refer to Sheet 26, this <u>TAB</u>. (4) State anticipated occurrence frequency and duration of abnoconditions: <u>Maximum abnormal temperature, pressure, and</u> humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) <u>327⁽¹⁾</u> Accident type <u>HELB</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> 4.7 x 10⁸ beta (d) Radiation (rd) <u>4 x 10⁷ gamma</u> Accident type <u>LOCA/HE</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u> 			(b) Pressure (psig) <u>.3</u> (b)	Pressure (psig) <u>.3</u>
 (d) Radiation (rd) <u>8 x 10</u>⁷ (d) Radiation (rd) <u>M4</u> (3) Process Interfaces: <u>NA: RTDs are installed in thermowells.</u> For effects of process temperatures, refer to Sheet 26, thi <u>TAB.</u> (4) State anticipated occurrence frequency and duration of abno conditions: <u>Maximum abnormal temperature, pressure, and</u> <u>humidity could exist for up to eight hours per excursion an</u> <u>will occur less than 1% of plant life.</u> (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) <u>327⁽¹⁾</u> Accident type <u>HELB</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> 4.7 x 10⁸ beta (d) Radiation (rd) <u>4 x 10⁷ gamma</u> Accident type <u>LOCA/HE</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u> 			(c) Humidity (%) <u>80</u> (c) 1	Humidity (%) <u>10</u> 4
 (3) Process Interfaces: <u>NA: RTDs are installed in thermowells</u>. For effects of process temperatures, refer to Sheet 26, thi TAB. (4) State anticipated occurrence frequency and duration of abno conditions: <u>Maximum abnormal temperature, pressure, and</u> <u>humidity could exist for up to eight hours per excursion an</u> will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) <u>327⁽¹⁾</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>HELB</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> (d) Radiation (rd) <u>4 x 10⁷ gamma</u> Accident type <u>LOCA/HE</u> (e) Spray Type <u>Boron⁽²⁾</u> 			(d) Radiation (rd) $\frac{8 \times 10^7}{4}$ (d) H	Radiation (rd) <u>NA</u>
For effects of process temperatures, refer to Sheet 26, thi TAB. (4) State anticipated occurrence frequency and duration of abnoconditions: Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) 327 ⁽¹⁾ Accident type HELB (b) Pressure (psig) 11.2 Accident type LOCA (c) Humidity (%) 100 Accident type LOCA/HE 4.7 x 10 ⁸ beta (d) Radiation (rd) 4 x 10 ⁷ gamma Accident type LOCA/HE (e) Spray Type Boron ⁽²⁾ Accident type LOCA/HE		(3)	Process Interfaces: <u>NA: RTDs are instal</u>	led in thermowells.
 TAB. (4) State anticipated occurrence frequency and duration of abnoconditions: Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accide parameter including peak, duration, and profile): (a) Temperature (°F) 327⁽¹⁾ (b) Pressure (psig) 11.2 (c) Humidity (%) 100 (c) Humidity (%) 100 (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA (e) Spray Type 			For effects of process temperatures, refe	er to Sheet 26, thi
 (4) State anticipated occurrence frequency and duration of abnoconditions: <u>Maximum abnormal temperature. pressure. and</u> <u>humidity could exist for up to eight hours per excursion an</u> <u>will occur less than 1% of plant life.</u> (5) Accident (worst case for any combination of specified accide parameter including peak, duration, and profile): (a) Temperature (°F) <u>327⁽¹⁾</u> (b) Pressure (psig) <u>11.2</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> (d) Radiation (rd) <u>4 x 10⁷ gamma</u> Accident type <u>LOCA</u> (e) Spray Type <u>Boron⁽²⁾</u> 				
 (4) State anticipated occurrence frequency and duration of abnoconditions: Maximum abnormal temperature, pressure, and humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life. (5) Accident (worst case for any combination of specified accide parameter including peak, duration, and profile): (a) Temperature (°F) 327⁽¹⁾ (b) Pressure (psig) 11.2 (c) Humidity (%) 100 Accident type LOCA (d) Radiation (rd) 4 x 10⁷ gamma Accident type LOCA (e) Spray Type 			<u>TAB.</u>	
humidity could exist for up to eight hours per excursion an will occur less than 1% of plant life.(5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) $327^{(1)}$ Accident type HELB (b) Pressure (psig) 11.2 Accident type LOCA (c) Humidity (%) 100 Accident type LOCA/HE 4.7 x 10 8 beta(d) Radiation (rd) 4×10^7 gamma Accident type LOCA (e) Spray Type Boron (2) Accident type LOCA/HE			<u>TAB.</u>	
will occur less than 1% of plant life.(5)Accident (worst case for any combination of specified accid parameter including peak, duration, and profile):(a)Temperature (°F) $327^{(1)}$ (a)Temperature (°F) $327^{(1)}$ Accident typeHELB(b)Pressure (psig)11.2Accident type(c)Humidity (%)100Accident type4.7 x 10beta(d)Radiation (rd) 4×10^{7} gammaAccident typeLOCA(e)Spray TypeBoronAccident typeLOCA/HE	·	(4)	TAB. State anticipated occurrence frequency and conditions: Maximum abnormal temperature	nd duration of abno e. pressure, and
 (5) Accident (worst case for any combination of specified accid parameter including peak, duration, and profile): (a) Temperature (°F) 327⁽¹⁾ Accident type <u>HELB</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> 4.7 x 10⁸ beta (d) Radiation (rd) <u>4 x 10⁷ gamma</u> Accident type <u>LOCA</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u> 	·	(4)	TAB. State anticipated occurrence frequency and conditions: <u>Maximum abnormal temperature</u> <u>humidity could exist for up to eight hour</u>	nd duration of abno e, pressure, and rs per excursion an
(a) Temperature (°F) $327^{(1)}$ Accident type <u>HELB</u> (b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> 4.7 x 10 ⁸ beta (d) Radiation (rd) <u>4 x 10⁷gamma</u> Accident type <u>LOCA</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u>		(4)	TAB. State anticipated occurrence frequency an conditions: <u>Maximum abnormal temperature</u> <u>humidity could exist for up to eight hour</u> will occur less than 1% of plant life.	nd duration of abno e. pressure, and rs per excursion and
(b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA</u> (c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> 4.7 x 10 ⁸ beta (d) Radiation (rd) <u>4 x 10⁷gamma</u> Accident type <u>LOCA</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u>		(4)	TAB. State anticipated occurrence frequency an conditions: Maximum abnormal temperature humidity could exist for up to eight hour will occur less than 1% of plant life. Accident (worst case for any combination parameter including peak, duration, and p	nd duration of abno e. pressure, and rs per excursion and of specified accide profile):
(c) Humidity (%) <u>100</u> Accident type <u>LOCA/HE</u> 4.7 x 10 ⁸ beta (d) Radiation (rd) <u>4 x 10⁷gamma</u> Accident type <u>LOCA</u> (e) Spray Type <u>Boron⁽²⁾</u> Accident type <u>LOCA/HE</u>		(4) (5)	TAB. State anticipated occurrence frequency an conditions: Maximum abnormal temperature humidity could exist for up to eight hour will occur less than 1% of plant life. Accident (worst case for any combination parameter including peak, duration, and p (a) Temperature (°F) 327 ⁽¹⁾	nd duration of abno e, pressure, and rs per excursion and of specified accide profile): ident type <u>HELB</u>
$4.7 \times 10^{8} \text{beta}$ (d) Radiation (rd) $4 \times 10^{7} \text{gamma}$ Accident type <u>LOCA</u> (e) Spray Type <u>Boron</u> Accident type <u>LOCA/HE</u>		(4)	TAB. State anticipated occurrence frequency and conditions: Maximum abnormal temperature humidity could exist for up to eight hour will occur less than 1% of plant life. Accident (worst case for any combination parameter including peak, duration, and peak, duration, and peak (a) Temperature (°F) 327 (b) Pressure (psig) 11.2 Accident	nd duration of abno e. pressure, and rs per excursion and of specified accide profile): ident type <u>HELB</u> ident type <u>LOCA</u>
(d) Radiation (rd) <u>4 x 10 gamm</u> a Accident type <u>LOCA</u> (e) Spray Type <u>Boron</u> Accident type <u>LOCA/HE</u>		(4)	TAB. State anticipated occurrence frequency an conditions: Maximum abnormal temperature humidity could exist for up to eight hour will occur less than 1% of plant life. Accident (worst case for any combination parameter including peak, duration, and peak, duration, and peak (a) Temperature (°F) 327 (b) Pressure (psig) 11.2 Accident (Compared to the formula to the f	nd duration of abno e. pressure. and rs per excursion and of specified accide profile): ident type <u>HELB</u> ident type <u>LOCA</u>
(2) (e) Spray Type <u>Boron</u> Accident type <u>LOCA/HE</u>		(4)	TAB.State anticipated occurrence frequency an conditions: Maximum abnormal temperaturehumidity could exist for up to eight hourhumidity could exist for up to eight hourwill occur less than 1% of plant life.Accident (worst case for any combination parameter including peak, duration, and p(a) Temperature (°F) $327^{(1)}$ (b) Pressure (psig) 11.2 (c) Humidity (%) 100 Accident4.7 x 10^8 beta	nd duration of abno <u>e, pressure, and</u> <u>rs per excursion and</u> of specified accide profile): ident type <u>HELB</u> ident type <u>LOCA</u>
		(4)	TAB.State anticipated occurrence frequency an conditions: Maximum abnormal temperaturehumidity could exist for up to eight hourhumidity could exist for up to eight hourwill occur less than 1% of plant life.Accident (worst case for any combination parameter including peak, duration, and p(a) Temperature (°F) 327 (b) Pressure (psig) 11.2 (c) Humidity (%) 100 $4.7 \ge 10^8$ beta(d) Radiation (rd) $4 \ge 10^7$ gamma Acci	nd duration of abno e. pressure. and rs per excursion and of specified accide profile): ident type <u>HELB</u> ident type <u>LOCA</u> ident type <u>LOCA/HE</u>

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BINDER NO.WBNEQ-ITE-003 PLANT_	WBN UNIT	S) <u>1</u> SHEET <u>26</u> OF <u>37</u>
BINDER TITLE INSTRUMENT	COMPUTED HWL	DATE <u>9/11/86</u> www.
TEMPERATURE ELEMENT	CHECKED WCG	DATE 9/12/86 240R
	<u> </u>	12-29-88

K. <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

(1) Due to effect of process temperatures, the temperature of the RTD head, during normal operation, will be approximately 200,F (refer to H(4)(d), Comment (1), Sheet 14, this TAB) and during DBE/Post-DBE environments, the RTD will be subjected to a conservative 50,C temperature rise above ambient (refer to Qualification Report WCAP-8687, Supp 2-E06A, Para 5.1, p 10). R1

(2) Refer to Sheet 30, this TAB, for composition.

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<u>ጥ</u> ፑMD ፑΌ ለ ጥነ	IDF FI FMENIT	CHECKED WCG	0/12/8	6. 2/00
			DATU <u>//12/0</u>	12-29-88
K. <u>REQU</u>	JIRED OPERATING ENVIRON	<u>MENT</u> (Continued	1)	
	Comments (duration/pe	ak/profile/spray	v composition a	nd pH.
	margin, etc.): <u>Refer</u>	to Sheet 30. th	his TAB.	
	·			
			·	<u></u>
(6)	Is the equipment subj	ect to moisture	or liquid intr	usion
	can affect the perfor accident conditions (mance of the equ Yes/No/NA)? <u> Y</u> e	uipment under d <u>es</u> (Reference	esign : <u>Ref</u>
	Sheet 28, this TAB			
(7)	Subject to submergence	e (Yes/No/NA)?	Yes (Referen	ce: R
	to Section 6 TAR C	- / 100 / 110 / 1111 / 1	<u></u> /1.01 01 01	<u>.</u>
	Tentife initiation			
	identify initiation t	une and duration	i of submergenc	e: <u>Ke</u>
	to Section 6. TAB C.	······································	,,,,,,,	
		<u>_</u>		i
(8)	Is the equipment subj the total accident do	ect to a beta ra se (Yes/No/NA)?	adiation contri Yes	bution
	(Reference: Environm	ental Drawing 4	7E235-42	<u></u>
	If yes, identify the beta dose to be added	fraction of the to the total do	unattenuated f ose and justify	ree fi : <u>Rec</u>
	<u>Beta dose is envelope</u>	d by the tested	<u>Beta dose (par</u>	a. 5.4
	<u>p. 11) therefore no a</u>	nalysis was requ	uired	
(9)	Special environmental	calculations (temp., rad., et	c.)
	Type		RIMS No.	
			· · · · · · · · · · · · · · · · · · ·	******
		·····		
		<u></u>		

BINDER NO.WBNEQ-ITE-003 PLANT_	WBN UNIT	S) <u>1</u> SHEET <u>28</u> OF <u>37</u>
BINDER TITLE INSTRUMENT	COMPUTED HWL	DATE <u>9/11/86</u> 4/2.77 /2-73-53
TEMPERATURE ELEMENT	CHECKED WCG	DATE <u>9/12/86</u> 7/92 12-29-89

K. <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

(6) Reference - Environmental drawing 47E235-42 (note 46). R1 To prevent moisture intrusion into the RTD/cable assembly, the RTD cable assembly interfaces with a Conax seal assembly. The RTD cable leads are enclosed in a flexibel, pressure-tight hose. The flexible, pressure-tight hose is helium leak tested to assure no degradation under HELB/LOCA environmental conditions (refer to Qualification Report WCAP-8687, Supp. 2-E06A, Para. 7.1, p 17). R1 Therefore, the RTD/cable assembly is not subject to moisture intrusion and will function as required under design basis conditions.

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BINDER NO. WBNEQ-ITE-003	PLANT WBN UNIT(S) 1 SHEET 29 OF 37 B B
BINDER TITLE INSTRUMENT	COMPUTED // DATE 5-11-86
TEMPERATURE ELEMENT	CHECKED WCM DATE 9-12-86

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	15 days	$\frac{\text{Fig 7, p 35}^{(1)}}{\text{Fig 7, p 35}^{(1)}}$.
Temperature (^O F)	327	420	$\frac{\text{Fig } (, \text{ p } 35_{(2)})}{\text{Tbl } 1, \text{ p } 18}$
Pressure (psig)	11.2	75	Fig 8.9, pp 36, 37 Tbl 1, p 18
Relative Humidity (%)	100 Sheet 30	100 Sheet 30	$\frac{\text{Tbl 1, p 18}^{(2)}}{\text{Para 3, 1, 7, pp 4, 5}}(1)$
*Chemical Spray	this tab	this tab	$\frac{\text{Tbl 1, p 18}}{\text{Parag 5 3 5 4}}$
**Radiation (rd)	1.2 x 10 <mark>8</mark> gamm <u>4.7 x 10</u> beta	a(3)	pp 10, 11 (2) Tbl 1, p 18 Refer to TAB C, Sect 6 for
Submergence	Yes	No	Analysis

*Includes spray concentration, flowrate, density, duration, and pH.

**Enter 40-year integrated normal dose plus integrated accident dose and specify type.

(2) Comparison of worst-case profiles and margin assessment:

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	Fig 7, p $35_{(2)}^{(1)}$ Tbl 1, p $18^{(2)}$
Pressure	Yes	Tbl 1, p 18 (2) , 57
Relative Humidity	Yes	Tbl_1, p_18 ⁽²⁾
Chemical Spray	Yes	Sheet 30, this tab Refer to TAB C, Sect 6 for
Submergence	No	Analysis
JUSTIFICATION/COMMENTS Qual	ification for submerg	ence has been
established by analysis.		
(1)(2)(3) Refer to Sheet 30,	this tab. PAGE	330
-3-86)	20°,	EQP127.23

BINDER NO.WBNEO-ITE-003 PLANT_	WBNUNIT(S)1SHEET_30_OF_37_
BINDER TITLE INSTRUMENT	COMPUTED_ <u>HWL</u> DATE <u>9/11/86 40239</u>
TEMPERATURE ELEMENT	CHECKED WCG DATE <u>9/12/86</u>
L. <u>SUMMARY COMPARISON OF TEST</u> (Continued)	CONDITIONS TO SPECIFIED CONDITIONS
(1) Qualification Report WC	AP-8687. Supp. 2-E06A.

(2) Equipment Qualification Data Package EQDP-ESE-6.

 $\begin{array}{c} (3) \\ \text{RTD TIP} \\ \text{Cable} \end{array} - 2.47 \stackrel{8}{\times} 10 \quad \text{rads gamma} \\ - 1.22 \stackrel{8}{\times} 10 \quad \text{rads gamma} \\ \text{RTD and Cable} \quad - 9.23 \times 10 \quad \text{rads beta} \end{array}$

Chemical Spray

Specified - The chemical spray composition is 0.19 Molar H_3BO_3 (2000 ppm Boron), 0.033 Molar NaOH resulting in a pH of 8.3 at 25°C. The flowrate is equal to 0.92 gal/min per square foot of containment cross section. Refer to Environmental Data Drawing 47E235-42, notes 5 and 22.

Demonstrated - The chemical spray composition consisted of 2750 ppm Boron buffered with 0.9 percent dissolved NaOH to a pH of 10.7 at 25°C and was applied from the start of HELB simulation to 24 hours. The flowrate was not specified. Refer to TAB C, Section 5 for acceptability.



|R1

R1

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L.	<u>SUMM</u> (Con	ARY COMPARISON OF TEST COND tinued)	DITIONS TO SPE	CIFIED CONDITI	ONS
~	(3)	Were margins applied to th addressed in the test prog and uncertainties are acco Yes/No/NA).	ne test parame gram to assure punted for? (ters or otherw that normal v Note margin ap	rise Tariation Plied,
		Suggested Margins per IE	<u>EE-323(74)</u>	Margin Applied	Yes/No/N
		Temperature: +15 degrees	F	> 15°F	Yes
		Pressure: +10% but no mor	e than 10 psi	g <u>> 10%</u>	Yes
		Radiation: +10% of accide	ent dose	> 10% (4)	Yes
		Time: +10% (or 1 hour + c per NUREG-0588)	operating time	None	(1)
		Voltage: ±10% of rated va	llue	NA	<u></u>
		Frequency: ±5% of rated v	ralue	<u>NA</u>	
		Environmental Transient: transient and the peak t applied twice	the initial comperature	(2)	Yes
		Vibration: +10% added to	acceleration	(3)	Yes
		JUSTIFICATION/COMMENTS	.) <u>Refer to TAB</u>	C. Section 7	<u>for plant</u>
		specific margin.			
		Qualification Report WC	AP-8687, Supp	2-E06A, Fig.	7. p 35.
		Equipment Qualification	n Data Package	EQDP-ESE-6, P	ara
		<u>2.10.3.3, p 11.</u>	<u> </u>		
		Refer to TAB C. Section	<u>9 for justif</u>	ication.	
				······	
					<u> </u>
				<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	

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TEMPE	RATU	RE ELEMENT CHECKED WBK DATE 6/12/86 78 12-29-88				
Μ.	<u>oper</u>	ABILITY TEST RESULTS				
	(1)	Identify the safety function(s) of this equipment: (Reference: <u>Refer to TAB A</u>				
		JUSTIFICATION/COMMENTS				
	(2)	Did the equipment perform its intended function during the simulated design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report WCAP-8687, Supp 2-E06A</u> ,				
		Para 3.2. p 5. Para 6.2. p 15. and Para 7.2. p 18				
		JUSTIFICATION/COMMENTS				
	(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)?_				
		(Reference: <u>Qualification Report WCAP-8687, Supp 2-E06A</u> ,				
	•	(Reference: Qualification Report WCAP-8687, Supp 2-E06A, Para 3.2, p 5, Para 6.2, p 15, and Para 7.2, p 18				
		(Reference: <u>Qualification Report WCAP-8687, Supp 2-E06A</u> , Para 3.2, p 5, Para 6.2, p 15, and Para 7.2, p 18 JUSTIFICATION/COMMENTS				
	(4)	<pre>(Reference: Qualification Report WCAP-8687, Supp 2-E06A, Para 3.2, p 5, Para 6.2, p 15, and Para 7.2, p 18 JUSTIFICATION/COMMENTS Did the test demonstrate the operability requirements for t required time interval for which the equipment is required operate (Yes/No/NA)? Yes (Reference: Refer to TAB C,</pre>				
	(4)	<pre>(Reference: Qualification Report WCAP-8687, Supp 2-E06A, Para 3.2, p 5, Para 6.2, p 15, and Para 7.2, p 18 JUSTIFICATION/COMMENTS Did the test demonstrate the operability requirements for t required time interval for which the equipment is required operate (Yes/No/NA)? Yes (Reference: Refer to TAB C, Section 7</pre>				
	(4)	<pre>(Reference: Qualification Report WCAP-8687, Supp 2-E06A, Para 3.2, p 5, Para 6.2, p 15, and Para 7.2, p 18 JUSTIFICATION/COMMENTS</pre>				
	(4)	<pre>(Reference: Qualification Report WCAP-8687. Supp 2-E06A. Para 3.2. p 5. Para 6.2. p 15. and Para 7.2. p 18 JUSTIFICATION/COMMENTS Did the test demonstrate the operability requirements for t required time interval for which the equipment is required operate (Yes/No/NA)? Yes (Reference: Refer to TAB C. Section 7 JUSTIFICATION/COMMENTS</pre>				
· ·	(4)	<pre>(Reference: Qualification Report WCAP-8687. Supp 2-E06A. Para 3.2. p 5. Para 6.2. p 15. and Para 7.2. p 18 JUSTIFICATION/COMMENTS </pre>				
	(4)	<pre>(Reference: Qualification Report WCAP-8687. Supp 2-E06A. Para 3.2. p 5. Para 6.2. p 15. and Para 7.2. p 18 JUSTIFICATION/COMMENTS</pre>				

BINI	DER NO	.WBNEQ-ITE-003 PLA	NT <u>WBN</u>	UNIT(S)	1	_ SHEET <u>33</u> 0	F
BINI	DER TI	TLE_INSTRUMENT	COMPUTED	IWL I)ATE <u>5/</u>	28/86 4.C.72 12-25-58	
<u>TEME</u>	PERATU	RE ELEMENT	CHECKED	<u>IBK</u> I	DATE <u>6/</u>	12/86 7/0R 12-29-88	
м.	OPER	ABILITY TEST RESULT	S (Continued)				
	(5)	Abnormal Condition properly addressed (Reference: <u>Quali</u>	s: Were abnorn and resolved (fication Report	nal condi (Yes/No/N : WCAP-86	tions IA)? 87, Su	or anomalies Yes pp, 2-E06A,	
		Para 6.2, p 15, an	d Para 7.3. p 1	.9).
		JUSTIFICATION/COMM	ENTS				
	· .	The qualification testing, an appare output occurred. Tests were perform beta radiation, an effects repeated.	report denotes nt transient ef ed to investiga d in none of th Westinghouse o itial tests wer	that dur fect on ate the a ne tests concluded re the re	the am apparen were t i that esult o and not	ta irradiatio plified RTD t response to he original the responses f conditions a response t	n
		observed in the in unique to the qual conditions reflect	ification test ing accident do	ses.			0
	. [.]	observed in the in unique to the qual conditions reflect The above anomaly report and the cor	ification test ing accident do was properly ac clusion concurr	dressed red with	in the	qualificatio	n
•	•	observed in the in unique to the qual conditions reflect The above anomaly report and the con	ification test ing accident do was properly ac clusion concurr	dressed red with	in the	qualificatio	n
	•	observed in the in unique to the qual conditions reflect The above anomaly report and the con	ification test ing accident do was properly ac clusion concurr	dressed red with	in the	qualificatio	n
•		observed in the in unique to the qual conditions reflect The above anomaly report and the cor	ification test ing accident do was properly ac clusion concurr	dressed red with	in the	qualificatio	n
		observed in the in unique to the qual conditions reflect The above anomaly report and the cor	ification test ing accident do was properly ac clusion concurr	idressed red with	in the	qualificatio	n _.
		observed in the in unique to the qual conditions reflect The above anomaly report and the cor	ification test ing accident do was properly ac clusion concurr	dressed red with	in the	qualificatio	n .

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TEM	CHECKED WELLEMENT CHECKED WELLEMENT						
N.	MAINTENANCE AND SURVEILLANCE Has the qualification program identified those surveillance, maintenanc and inspection parameters which are essential to maintain qualification which aid in detecting degrading materials or equipment performance (yes/no/NA)? <u>Yes</u> (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets). JUSTIFICATION/COMMENTS						
		a					
BINDER NO PLANT ONT(S)	SALLA OF R R DATE 5-23-86						
---	---------------------------------						
TEMPERATURE ELEMENT CHECKED	DATE 4/12/86						
0. <u>Summary of Review</u>	<u>Yes/No/NA</u>						
 (1) Documented evidence of qualification adequate (Have all assumptions, mathematical models, all extrapolations of test data used in an analysis been justified and documented)? 	and Yes						
(2) Any exceptions (i.e., sound reasons to the co taken to the specified qualification level adequately justified?	ntrary) <u>NA</u>						
(3) Choice of qualification methodology adequatel justified?	y <u>Yes</u>						
(4) If analysis was performed, complete the follo	wing:						
(a) Were equipment performance requirements identified?	<u>NA</u>						
(b) Were specific features and failure modes effects analyzed?	and <u>NA</u>						
(c) Were assumptions and mathematical models together with appropriate justification their use?	used forNA						
(d) Were environmental parameters which affec equipment performance identified?	nA						
(5) Adequate similarity between equipment and tes specimen established?	t <u>Yes</u>						
(6) Aging degradation evaluated adequately?	Yes						
(a) Mechanical and/or cycle aging addressed?	Yes						
(b) Equipment aged to end of life condition p application of DBE conditions?	prior to <u>Yes</u>						
(c) Absence of preaging in test/analysis just	ified? <u>NA</u>						
(d) Materials susceptible to thermal/radiatic	on <u>Yes</u>						

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HINDER NO. WBNEQ-ITE-003 PLANT WBN UNIT(S) 1	SHEET 36 CF 37
DER TITLE INSTRUMENT COMPUTED	R R 57-28-86
TEMPERATURE ELEMENT CHECKED WITH DATE	6/0/86

0. <u>SUMMARY OF REVIEW</u> (Continued)	<u>Yes/No/NA</u>
(e) Normally operating state of device (e.g., normal energized) considered?	ly Yes
(7) Qualified life or replacement schedule established?	Yes
(8) Criteria regarding temperature/pressure exposure satisfied?	<u>Yes</u>
(a) Peak temperature adequate	Yes
(b) Peak pressure adequate	Yes
(c) Duration adequate	Yes
(d) Required profile enveloped adequately	Yes
(e) Steam exposure adequate	Yes
(9) Criteria regarding test sequence satisfied?	Yes
(10) Criteria regarding spray satisfied?	Yes
(a) Was the spray testing done while under the extremes of pressure and temperature?	Yes
(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed those to be used for the plant?	No; Refer to TAB C, Sect 5 for <u>Acceptability</u>
(11) Criteria regarding submergence satisfied?	Yes
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered?	Yes
(13) Criteria regarding operability status/mode satisfie	d? Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

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TEMPERATU	RE ELEMENT	CHECKED D	ате <u>//<i>3/8</i></u>	26
0. <u>Summa</u>	RY OF REVIEW (Contin	ued)		Ves/No/NA
(15) C	riteria regarding fu	nctional testing satisfie	d?	Yes
(a) Does the test pla criteria for eq	n/report specify an accep uipment performed?	tance	Yes
(1	b) Was an initial ba required perfor	nse line test done to esta mance characteristics?	blish	Yes
()	c) Has the test/anal performance spe (e.g., voltage, electrical char	ysis demonstrated that per cifications and character load frequency, and other acteristics) can be ensur	rformance istics r ed?	<u>Yes</u>
(16) C	riteria regarding in	strument accuracy satisfic	ed?	No pending resolution of open item
(17) T	est duration margin satisfied?	(1 hour + function time)		Yes
()	a) Is the minimum sp l hour?	pecified operating time at	least	Yes
(1	b) If exception to t was taken, was	he l-hour minimum operati adequate justification pro	ng time ovided?	<u>NA</u>
(18) C	riteria regarding sy	nergistic effects satisfi	ed?	Yes
(19) C	riteria regarding ma	rgins satisfied?		Yes
(20) M.	aintenance and surve identified?	eillance requirements adeq	uately	Yes
P. <u>DISCU</u>	SSION			

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PREPARER/DATE_HWL_9/11/86 CHECKED/DATE_WCG

PAGE A.I.R.

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CAB A
elevations for equipment located in or elevations for equipment located . Actual elevations for all equip-
ategory and Operating Time assign-

BINDER TITLE INSTRUMENT	COMPUTED <u>HWL</u> DATE <u>9/11/86</u> <u>WCG</u> 12/20/88 ⁷ /
TEMPERATURE ELEMENT	CHECKEDWCG DATE <u>9/17/86</u> HDR 1/4/89 7//6
A. DOCUMENTATION	Posistones Temperature Detector
Equipment Description	(Fast Response Well Mounted)
Vendor/Manufacturer	RdF
Equipment Model No.(s)	<u>21232-2 and 3</u>
QUALIFICATION REPORTS	
(1) Title/Number/Revision tion Test Report WC	on <u>Equipment Qualifica-</u> RIMS <u>B45 851203 357</u> AP-8687, Supp. 2-E07A,
Revision 3	DATE <u>March, 1983</u>
OTHER (ANALYSIS, VENDOR	DATA, ETC.) (1) The following documenta-
tion is required to suppo	ort qualification:
<u>a) OE Calculation WBNO</u>	SG4-017 R11, Reactor Coolant System (68)
NUREG 0588 Category	and Operating Times (B18 900612 252).
NUREG 0588 Category b) OE Calculation WBNOS	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System Allow 266 egory and Operating Times (B18 900309 232).
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System egory and Operating Times (B18 900309 232). ng 47E235-50 R1
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System (Mar 24) egory and Operating Times (B18 900309 232). ng 47E235-50 R1 ng 47E235-42 R2
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System egory and Operating Times (B18 900309 232). ng 47E235-50 R1 ng 47E235-42 R2 ng 47E235-41 R1
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin f) WBN Normal and Accie	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System (B18 900309 232). APA 246 egory and Operating Times (B18 900309 232). ng 47E235-50 R1 ng 47E235-42 R2 ng 47E235-41 R1 dent Process Temperatures for the RHR Pump
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin f) WBN Normal and Accie Discharge (TAB C, Pa	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System (APA 26) egory and Operating Times (B18 900309 232). ng 47E235-50 R1 ng 47E235-42 R2 ng 47E235-41 R1 dent Process Temperatures for the RHR Pump age C-22).
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin f) WBN Normal and Accie Discharge (TAB C, Pa g) Justification for HB	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System egory and Operating Times (BNS 900309 232). ng 47E235-50 R1 ng 47E235-42 R2 ng 47E235-41 R1 dent Process Temperatures for the RHR Pump age C-22). ELB/LOCA Chemical Spray Qualification
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin f) WBN Normal and Accid Discharge (TAB C, Pa g) Justification for HH Deficiency (TAB C, H	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System (B18 900309 232). APR 246 egory and Operating Times (B18 900309 232). Ang 47E235-50 R1 Ang 47E235-42 R2 Ang 47E235-42 R2 Ang 47E235-41 R1 dent Process Temperatures for the RHR Pump Age C-22). ELB/LOCA Chemical Spray Qualification Page C-24).
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin f) WBN Normal and Accie Discharge (TAB C, Pa g) Justification for HF Deficiency (TAB C, F	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System (BN8 900309 232). Ang 47E235-50 R1 Ang 47E235-42 R2 Ang 47E235-42 R2 Ang 47E235-41 R1 dent Process Temperatures for the RHR Pump Ange C-22). SLB/LOCA Chemical Spray Qualification Page C-24).
NUREG 0588 Category b) OE Calculation WBNOS (74) NUREG 0588 Cate c) Environmental Drawin d) Environmental Drawin e) Environmental Drawin f) WBN Normal and Accid Discharge (TAB C, Pa g) Justification for HH Deficiency (TAB C, H	and Operating Times (B18 900612 252). SG4-020 R8, Residual Heat Removal System (APA 26) egory and Operating Times (BN8 900309 232). ng 47E235-50 R1 ng 47E235-42 R2 ng 47E235-42 R2 ng 47E235-41 R1 dent Process Temperatures for the RHR Pump age C-22). ELB/LOCA Chemical Spray Qualification Page C-24).

BIND	ER TITLEINSTRUMENTCOMPUTEDHWLDATE 9/11/86 WCG
TEM	12/20/8 PERATURE ELEMENT CHECKED WCG DATE <u>9/17/86 HDR</u> 1/4/89
OTH	ER (ANALYSIS, VENDOR DATA, ETC) (Continued)
	h) Material Aging Calculation Reports WAC-103 Dtd 5-20-86,
	WAC-191 Dtd 9-3-86 (Both Applicable to 1-TE-68-319, -324) and
	WAC-58 Dtd 4-8-86 (Applicable to 1-TE-74-14, -25). Calcula-
	tions determine qualified lifetimes and post-DBE qualified
	lifetimes.
	i) OE Calculation WBNOSG4-075, NUREG-0588 Loop Accuracy for
	TE-68-319 and TE-68-324. (B45 860812 219)
	j) DNE Calculation WBPEVAR9004014. Required/Demonstrated Accuracy
	Calculation for Reg. Guide 1.97 Cat. 2 Loops with Transmitter
	and/or Sensor in a Harsh Environment (B26 900609 400)
	(TE-74-14 and -25).
2.	In addition to qualification reports listed on Sheet 1 this sec-
	tion. the following documentation required to support qualification
	is included in TAB D - Qualification Documents
	a) Equipment Qualification Data Package WCAP-8587 FODP-FSF-7
	Rev. 5. Dtd 3/83 (B45 851203 356)
3.	The following documentation required to support qualification is
	included in TAB E - Miscellaneous Documents and Correspondence
	a) Equipment Specification 953297 Rev. 1 Dtd 3-11-83 (NEB 830629
	<u> </u>
	b) Specifications for Resistance Temperature Detectors with Wells
	Spec Sheet No. 4.39 (Applicable to 1-TE-68-319 -324)
	c) Specifications for Resistance Temperature Detectors with Walls
	Spec Sheet No. 6.39 (Applicable to 1 TE 74.14 OF)

PAGE B-2 R2



BINDER	R <u>1</u> R_ IITLEINSTRUMENT COMPUTED HWL DATE 9/11/86
TEMPER	ATURE ELEMENT CHECKED WCG DATE 9/17/86 HOR 1-4-89
OTHER	(ANALYSIS, VENDOR DATA, ETC) (Continued)
<u>3. d)</u>	Traceability of Installed RTD to it's Qualification Document-
·	ation (Section includes Auditable Link Document EQAL-WAT, Rev.
·	3, Dtd March 1986, RIMS Accesssion No. B45 860521 351, Quality
	Releases N-58820 Rev. 0, and Applicable Certificate of
	Compliances).
<u>e)</u>	Letter from Westinghouse to D. W. Wilson Dtd 320-86 (B71
. <u></u>	860403 004) states Qualified Radiation Exposure limits of
	1.22 x 10 rads (on cable), applicable to Model 21205 RTD, are
	acceptable limits for use on Model 21232 RTD's.
f)_	Letter from J. A. Raulston to Westinghouse Dtd 1-13-86 (B45
	860113 103) acknowledging receipt of Data Package WCAP-8587.
	EODP-ESE-7, Rev 5 and Qualification Report WCAP-8687, Supp. 2-
	E07A, Rev. 3.
g)	Letter from Westinghouse to D. Wilson Dtd 3-27-86 (B71 860404
	002) states type, manufacture and activation energy of the
	epoxy used in RTD assembly. Also, states epoxy location in
	RTD assembly.
<u>h)</u>	Letter from Westinghouse to D. L. Kitchel Dtd 5-15-86 (B71
<u> </u>	860516 004) states Cal-Note SEC-OSA-1242-CO, on file at West-
	house, may be used for pressurizer RTDs 1-TE-68-319, -324 when
· <u> </u>	calculating qualified life.
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TEMPERATURE		UHEUKED_	WCG	DAIE <u>971</u>	-4-89 1-4-89
OTHER (ANAL)	YSIS, VENDOR DATA	, ETC) (Con	tinued)		
3. i) Condu	uit and Grounding	Penetratio	n Sealing	and Fire	<u>stop Deta</u>
TVA_I	Drawing 45W883-3 1	R15	<u></u>		
Condu	uit and Grounding	Floor EL 7	16.0. De	tails She	et 9. TVA
Drawi	ing 45N862-11 R32	. Conduit	and Groun	ding EL 7	13.0, Col
A5-A1	11, U-W Floor Play	n, TVA Draw	ing 45N82	<u>4-4 R26.</u>	
<u>j) Trace</u>	eability of insta	lled thermo	wells.	<u> </u>	
4. Westingho	ouse Drawings 265	7C49_R3_and	21232 R5	; Rdf Dr	awings 524
and 52476	6; all incorporate	ed in TAB I	•		
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·					
· <u>····································</u>					
• <u></u>		······			· · · · · · · · · · · · · · · · · · ·
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		<u></u>			
NOTE: Docum	ments listed above	e are used	throughou	t this bi	nder for
Infor	rmation Management not be repeated	t System (R in other se	IMS) numb ctions of	ers, as 1 the bind	isted abov ler. This
list qual comp	ing includes only ification and accord lete listing of b:	those docu ordingly sh inder refer	ments whi ould not ences.	ch are es be consid	ssential to lered a

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	EMPERATURE ELEMENT CHECKED WBK DATE 6/25/86 47M	
)		
В.	<u>CONCLUSION OF REVIEW</u> (Check only one block)	
	<u>X</u> Equipment Qualified (Pending Resolution of Open Items)	
	Equipment Satisfied All Requirements Except Qualified Life	
	or Justification of Replacement Schedule	
	Equipment Qualification Not Established by Documentation	
	Equipment Not Qualified Based on Test Failures	
	OPEN ITEMS AND OUALIFICATION DEFICIENCIES	ł
	1 Instrument Assures Calculations are required for Sustern 69	- f
	1. Instrument Accuracy carculations are required for System 08	-
	RTDs.	- 1
	<u></u>	-
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	COMMENT/RECOMMENDATIONS	-
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WREP	-00330	
110126	PAGE B-5 R2	

WBNEQ-ITE-004

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Page B-6 was deleted per revision 2.

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BIND	RR	R
TEM	PERATURE ELEMENT CHECKED WHAL DATE 6-11-80	
с.	QUALIFICATION CRITERIA	
,	Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate All Documents Which are Applicable):	
	X Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE323-1974)	
	Components are Qualified to the Criteria of NUREG-058 Category II or the DOR Guidelines of lE Bulletin No. 79- 01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)	
	JUSTIFICATION/COMMENTS	·
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	
	<u>1222 344-1975</u>	

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BIND	ER NO. <u>WBNEQ-ITE-004</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>7</u> OF <u>4</u> R <u>1</u> R
BIND	ER TITLE INSTRUMENT COMPUTED HWL DATE 6/10/86
_TEM	PERATURE ELEMENT CHECKED WCG DATE 6/11/86
D.	<u>QUALIFICATION METHODOLOGY</u> (Check only one block)
	X Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
•	Test of Similar Items with Supporting Analysis
	in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
	Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis
	JUSTIFICATION/COMMENTS The RTDs tested were RdF Models 21232-1 and
	21232-3. The Model 21232-2 was not tested. It differs from those
	tested only in length. The test units were selected because their
	longer length better represented the design in vibration and seis-
	mic tests. All three models are otherwise of identical design.
	Refer to Qualification Report WCAP-8687, Suppl 2-E07A, page 2,
	paragraph 2.1, and to TAB E, Section 4 for Traceability of RTDs to
	their Qualification Documentation. During HELB simulation tests,
	the RTD/Cable Assemblies were subjected to chemical spray from
	start of test to 24 hours (Refer to Qualification Report WCAP-8687,
	Supp. 2-E07A, paragraph 3.1.7, page 5). Flow rate was not denoted.
	RTDs 1-TE-68-319 and -324 are required to operate for 100 days
	following a LOCA. Refer to TAB C, Section 3 for acceptability.

PAGE B-8 RI

IND	ER TI	TLE INSTRUMENT	COMPUTEDH	<u>IL</u> DATE <u>9/11</u>	186 min
<u>TEM</u>	PERAT	URE_ELEMENT	CHECKEDWO	<u>DATE 9/17</u>	<u>/86 2/012</u>
Ε.	EQUI	PMENT DESCRIPTION		,	
	Is t iden (Yes	he equipment identif tical to the plant e /No/NA)? <u>Yes</u>	ied in the qual quipment which	ification docum requires qualif	entation ication
			<u>Plant Device</u> Resistance	Qualification Document	Reference
	(1)	Equipment Type	Temperature Detector	Same	(1)
	(2)	Manufacturer	RdF	Same	
	(3)	Model Number(s)	(2)		Table 1 (1 page 19
					Table 1 (1
	(4)	Serial Number(s)	(2)	100, 101,	page 19
				102, 103	
			· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·
	(5)	Identify Component-	_NA		
		attached:	- <u></u>		
	JUST	IFICATION/COMMENTS	(1) Qualificat	ion Report WCAP-	-8687
	Supp	. 2-E07A			
	(2)	Component	Model No.	<u>Serial No.</u>	
		1-TE-68-319	21232-2	109	
		1-TE-68-324	21232-2	108	
		1-TE-7/4-14	21232-3	164	
		1-TE-74-25	21232-3	163	

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BINDER NO. WBNEQ-ITE-004 PLANT_	WBN	UNIT(s) <u> 1 </u>	SHEET 9_0F_43_
BINDER TITLE INSTRUMENT	COMPUTED_	HWL	DATE <u>9/11</u>	R_1_R /86 <u>tvc.</u> , y // ts-rs
TEMPERATURE ELEMENT	CHECKED	WCG	DATE <u>9/17</u>	/86 # 9R

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification documentation and/or evaluation and reference the source. Is the interface a requirement for our application (Yes/No)? (Note below.) If yes, enter requirement in QMDS, if no, provide justification.

Interface	Identify Interface	Plant Requirement? (Yes/No)	Reference Test Report	
Mounting Bolts	NA			
External Process Connections	<u>Nuclear</u> gualified		. <u></u>	
Electrical Connections	splice and (1)	Yes	<u>G-38</u>	R1
Conduit Seals	(1)	Yes	(2)	
Connector Seals	NA			
Orientation	NA			
Physical Configuration	<u>NA</u>			
Other	(3) (4)			
JUSTIFICATION/CO	MMENTS (1) RTD Cable	Assembly interfa	aces with a	
<u>Conax seal and e</u>	lectrical connections	are made within	the Conax	1
<u>Seal (Refer to T</u>	AB E Section 9 TVA Dr	awing 45W883-3, 1	Detail F3)	R1
<u>Environmental qu</u>	alification of Conax	seal is documente	ed in EQ	
Binder WBNEQ-CSC	-001.	·····		1
<u>(2) Qualificatio</u>	n Report WCAP-8687. S	upp. 2-E07A, para	a. 7.1, pages	R1
<u> 16 and 17.</u>				
JUSTIFICATIONS/C	OMMENTS continued on	Sheet 9A.		

PAGE B-10

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•	BINDER NO. WBNEQ-ITE-004 PLANT WBN UNIT(S) 1 SHEET 9a OF 43
	BINDER TITLE INSTRUMENT COMPUTED HWL DATE 9/11/86
	TEMPERATURE ELEMENT CHECKED WCG DATE 9/17/86 2/0/- /-4-89
	(3) The RTD cable must be seismically supported to maintain seismic
	qualification. For seismic installation requirements, refer to
	(4) Installation Requirements are per Westinghouse drawing RCS Fast
	<u>Response RTD Installation Details Drawing No. 2657C49 (refer to</u> R1
	TAB I. Section 1). RTD to be used with thermowell as specified
	Drawing No. 21232 (refer to TAB L. Section 2).
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	PAGE B-11 RI

. <u>TES</u>	<u> </u>	JENCE			
(1)	Test the para	Sequence: Was the test se accident environment in acc agraph 6.3.2 (Yes/No/NA)? ()	quence establ ordance with Note below.)	lished to simulate IEEE-323 (74),	
			<u>Yes/No/NA</u>	<u>Reference</u> para. 2.9,	
	(a)	Equipment inspected for	Yes	(1) pg 9	
	(b) (c)	damage Baseline performance measurements taken Equipment aged: ⁽⁴⁾	Yes	para. 2.9, pg. 9, ⁽¹⁾ <u>App C. pg 56</u> ⁽²⁾	
		Thermal	Yes	para. 5.1, (2) p <u>g 10</u> para. 5.3,	
		Radiation	Yes	(2) $pg 10$ para . 3.2,	
		Wear	Yes	(2) pg 5	
	(d)	Vibration/seismic testing conducted	Yes	para. 5.4, pg 11 (2) para. 5.5, pg 12 (2)	
	(e)	Design basis event (DBE) exposure	Yes	para. 5.6, (2) p <u>g 13</u> para. 5.6,	
	(f)	Post-DBE exposure	Yes	pg 13 (2)	
	(g)	disassembly	(3)	(3)	
(2)	Was sequ	the same piece of equipment ence described in item (1) a	used through above (Yes/No	NA)? Yes	
(3)	Have cali	the test equipment, test ec bration data been appropriat	quipment accu cely document	racies and (Yes/No/NA)? <u>Yes</u>	
•	(Ref	erence: <u>Table 2. pp 20-23</u>	(2)).	
7110	TIFIC	ATION/COMMENTS (1)	: Oualificati	on Data Package	

BINDI	ER TITLE INSTRUME	N1	COMPUTED_	HWL	DALE <u>0/1</u>	12-20-05
TEMPI	ERATURE ELEMENT		CHECKED	WBK	DATE <u>6/1</u>	1/86 Hor 1-4-89
	JUSTIFICATION/C	omments (c	ontinued).	• • •		
	and were subjec	ted to pos	t Qualific	ation Pe	rformance	Tests
	<u>(Refer to Quali</u>	fication R	eport WCAP	<u>-8687, s</u>	Supp. 2-EO	7A Appx C).
	(4) RTDs_were_s	ubjected t	<u>o thermal</u>	cycling	(Refer to	
	Qualification R	eport WCAP	<u>-8687 Supp</u>	<u>. 2-EO7A</u>	page 10	. .
	paragraph 5.2).					
						•
	•					
			•			
				,		

BINI	DER NO	WBNEQ-ITE-004 PLANT_	WBN UNI	T(S) <u>1</u>	SHEET <u>12</u> 0 R/R
BINI	DER TI	TLE INSTRUMENT	COMPUTED <u>HWL</u>	DATE <u>6/</u>	19/86 tuc "
TEMI	PERATU	RE ELEMENT	CHECKED <u>WBK</u>	DATE <u>6/1</u>	<u>19/86 1/91 -</u> 1-4-89
H.	AGIN	G			
	(1)	Was aging considered (Yes/No/NA)? <u>Yes</u>	in the qualifica (Reference: <u>Qua</u>	tion progra lification	am Report
'n		WCAP-8687 Supp. 2-E07	A, paragraph 3.1	<u>, page 3)</u> .	
		JUSTIFICATION/COMMENT	S		
	(2)	Were the following ef	fects considered	in the agi	.ng program:
		Aging Effect		<u>Yes/No/NA</u>	<u>Reference</u> para, 3.1.1
		Thermal aging		Yes	(1) pg 3
		Radiation exposure		Yes	para. 3.1.3 <u>3.1.4, pg 4</u> para. 3.1.5
		Vibration (non-seismi	c) aging	Yes	pg 4 (1)
		Operational (electric process) stress agin	al/mechanical/ g	Yes	para. 3.1.2 pg 3 ⁽¹⁾ Para <u>3.1.5.</u>
		JUSTIFICATION/COMMENT	(1) S <u>Qualifica</u>	tion Report	Pg 4 (1) WCAP-8687,
		Supp. 2-E07A	· · · · · · · · · · · · · · · · · · ·	•	
	(3)	Were all known synerg significant effect on aging program (Yes/No	istic effects wh equipment perfo /NA)? <u>NA</u>	ich are bel rmance cons (Reference	ieved to hav idered in th
		JUSTIFICATION/COMMENT	S <u>Based upon re</u>	view of mat	erials of
		construction, no know	<u>n synergistic ef:</u>	fects apply	to this
		equipment.			
	(4)	Thermal Aging:			
		(a) Was thermal aging	considered in	the qualifi	cation progra
		(Yes/No/NA)? <u>Ye</u> WCAP-8687 Supp.	s (Reference: 2-E07A paragraph	<u>Dualificati</u>	on Report
	•	paragraph 5.1, p	age 10).	<u> </u>	
		JUSTIFICATION/CO	MENTS		

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	BINDER	NO. <u>WBN</u>	EQ-ITE-004 PLAN	C <u>WBN</u>	UNI1	C(S) <u>1</u>	SHEET 13 ()F_4
	BINDER	TITLE_	INSTRUMENT	COMPUTED	HWL	DATE <u>9/1</u>	1/86 with	
	TEMPER	ATURE E	LEMENT	CHECKED	WCG	DATE <u>9/1</u>	7/86 249R	
	H. <u>AG</u>	<u>ING</u> (Co	ntinued)					
÷		(b)	Were the materia identified in th (Reference: <u>Qual</u> 2-E07A, paragrag	als suscept: ne qualifica ification H ph 3.1.1, pa	ible to ation pr Report b age 3).	thermal ag cogram (Yes ICAP-8687 S	ing degradat /No/NA)? <u>Ye</u> upp.	:ion :s
			JUSTIFICATION/CO	MMENTS		,		_
		(c)	Was the basis for qualification pr Equipment Qualifi paragraph 1.9. p Supp. 2-E07A, pa	or thermal a cogram (Yes, lication Dat age 4; Qual tragraph 5.1	aging id /No/NA)? ta Packa Lificati L, page	lentified i <u>Yes</u> (age EQDP-ES on Report 10).	n the Reference: E-7, WCAP-8687	
			JUSTIFICATION/CO	MMENTS				
		(d)	Was the aging ac of time and temp program (Yes/No/ <u>Report WCAP-868</u> 7	celeration perature ide NA)? <u>Yes</u> Supp. 2-E(rate ju entified (Refer <u>)7A, par</u>	stified an in the qu ence: <u>Qual</u> agraph 5.1	d the parame alification ification . page 10).	ter
			Parameter Pla Temperature <u>20</u> Time	nt <u>Maximum</u> 0°F ⁽¹⁾ 101 40 Years	<u>Normal</u> 4°F ⁽²⁾	$\frac{\text{Test}}{400 \circ \text{F}}^{(3)}$ $\frac{11 \text{ days}}{11 \text{ days}}$	Equivalent 200°F (4) <u>104°F</u> > <u>40 Years</u>	
			JUSTIFICATION/CO 14, this TAB.	MMENTS) (2) (3) (4) Refe	r to Sheet	_
		(e)	Was the Arrheniu (Yes/No/NA)? <u>Ye</u> Data Package EQI	s methodolo <u>s</u> (Refere P-ESE-7, pa	ogy used ence: <u>Eg</u> aragraph	for accel uipment Qu 1.9, page	erated aging alification _4).	_
			JUSTIFICATION/CO	MMENTS				_
	•	(f)	If activation en aging parameters of the technical (Reference:	ergies were , are they data (Yes/ Refer to Sh	e used f properl /No/NA)? neet 14,	or determin y referenc <u>No</u> this TAB)	ning acceler ed to the so	ate urc
			JUSTIFICATION/CO	MMENTS				
						<u>,</u>	<u></u>	-
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1	BINDER NO. WBNEQ-ITE-004 PI	LANT	WBN	_ UNIT(S	5)1	SH	EET <u>14</u>	_0F_ <u>43</u>
	BINDER TITLE INSTRUMENT		COMPUTED	HWL	DATE	R_ <u>9/11/8</u> 6	<u> </u>	2 CAF
	TEMPERATURE ELEMENT		CHECKED	WCG	DATE	<u>9/17/8</u> 6	12/20/2 <u>HDR</u> 1/4/89	887/12/90 AIM T/16/90

H(4)Aging (Continued)

- (1) The plant maximum normal temperature for RTDs 1-TE-68-319, -324 is 200°F. Qualification Report WCAP-8687, Supp 2-E07A, page 10, paragraph 5.1 denotes a 50° temperature rise due to the effects of the Reactor Coolant System temperature, was used in determining Qualified Life. Westinghouse has performed an analysis (Cal-note SEC-0SA-1242-CO- on file at Westinghouse) that demonstrates that the air velocity and the ambient temperature of the area are sufficient to limit the temperature of the RTD's head to 200°F.
- (2) <u>Temperature rise due to process temperatures for RTDs</u> <u>1-TE-74-14, -25 is considered negligible. The normal process</u> <u>temperature is 137°F (Refer to TAB C, Sect 1) and the air</u> <u>velocity and ambient temperature are considered sufficient</u> <u>to limit the temperature of the RTDs head to the plant's</u> <u>maximum normal of 104°F.</u>
- (3) <u>Qualification Report WCAP-8687, Supp. 2-E07A, paragraph 5.1,</u> page 10.
- (4) <u>Refer to TAB C, Sect. 3-Calculations WAC-103 and WAC-58 for</u> <u>plant specific Qualified Life.</u>
- (5) The activation energy used is denoted in paragraph 3.1.1, page 3 of Qualification Report WCAP-8687, Supp. E07A. Also, Refer to TAB E, Sect 7 - Letter from Westinghouse to D. Wilson Dtd March 27, 1986 (B71 860404 002).

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TEMPERATURE H	$\frac{1}{1} = \frac{1}{1} = \frac{1}$
	1-4-89
H. <u>AGING</u> (Co	untinued)
(g)	If a regression line was used for determining acceleration aging parameters, are test points or failure modes identified on the line (Yes/No/NA)? <u>NA</u> (Reference:
	JUSTIFICATION/COMMENTS
(h)	Was the equipment operated during the thermal aging (Yes/No/NA)? Yes (Reference: Qualification Report
	JUSTIFICATION/COMMENTS
(5) Radi	ation Aging Exposure:
(a)	Was radiation aging exposure considered in the qualific program (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification</u> <u>Report WCAP-8687 Supp. 2-E07A, paragraph 3.1.3, 3.1.4,</u> page 4 and paragraph 5.3, page 10).
	JUSTIFICATION/COMMENTS
(b)	Were the materials susceptible to radiation degradation identified in the qualification program (Yes/No/NA)? Ye (Reference: <u>Qualification Report WCAP-8687, Supp.</u> 2-E07A, para. 3.1.1, p 3).
	JUSTIFICATION/COMMENTS
	Was the basis for radiation aging exposure identified i the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>See Comments</u>).
(c)	
(c)	JUSTIFICATION/COMMENTS <u>Design Specification 9532978</u> <u>Rev 1. paragraph 12.3.2. page 17. Refer to TAB E. Sect.</u> <u>Qualification Report WCAP-8687. Supp. 2-E07A. paragraph</u> <u>3.1.3. 3.1.4. page 4).</u>

H. <u>AGING</u> (Co	ontinued)	
(d)	Is the radiation test exposure dose and dose r acceptable (Yes/No/NA)? <u>Yes</u> (Reference: <u>S</u>	ate ee
•	Comments),	
	Plant normal ambient radiation $7(1)$ dose (rd) $2x10$ 4.	5 (2) 3x10
	6 (2A) <u>1x10</u> Tip of RTD 1	.56x10 ⁸ (3)
	Test exposure dose (rd) <u>Cable 1.22x1</u>	8 (4)
	Test exposure dose rate (rd/hr) <u>Between 2x10</u> 6 (5) 2.5x10	6 and
•	Test exposure source type ((e.g., Co-60 gamma) <u>CO-60 gamma</u>	6)
	JUSTIFICATION/COMMENTS(1) (2) (3) (4) (5) (6to Sheet 17 this TAB.) <u>Refer</u>
(6) Vibr	ration (non-seismic) Aging:	
(a)	Were the effects of non-seismic vibration indu normal and abnormal operation addressed in the qualification program* (yes/no/NA)? (Reference: <u>Qualification Report WCAP-8687 Sur</u> <u>2-E07A para. 3.1.5, pg. 4 & para. 5.4, pg 11).</u>	ced during
	JUSTIFICATION/COMMENTS	
(b)	Was the basis for vibration aging identified an in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report WCAP-8687 Su</u> <u>2-E07A para. 3.1.5 pg. 4 and para. 5.4 pg. 11</u>)	nd justifie pp
	JUSTIFICATION/COMMENTS	

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	BINDER NO. <u>WBNEQ-ITE-004</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>17</u> OF	43
	BINDER TITLE INSTRUMENT COMPUTED HWL DATE 9/11/86	
	TEMPERATURE ELEMENT CHECKED WCG DATE 9/17/88 2494C	<u> </u>
	H(5)(d) Aging - Justification/Comments	
	(1) Applies to 1-TE-68-319	n 1
	(2) <u>Applies to 1-TE-74-14, -25</u> , (2A) <u>Applies to 1-TE-68-324</u> .	ΚL
-	(3) <u>Qualification Report WCAP-8687, Supp. 2-E07A paragraph 5.3</u> page 10 and 11.	
	(4) <u>Refer to TAB E. Sect. 5. letter from Westinghouse to D. W.</u> Wilson Dtd. 3-20-86 (B71 860403 004) - states gualified radiation	
	exposure limits of 1.22x10 ⁸ rads (on cable) applicable to Model 21205 RTDs, are acceptable limits for use on Model 21232	
	RTDs (Qualification of Model 21205 RTDs is documented in EQ Binder WBNEQ-ITE-004).	
	(5) Per telecon between L. Capone of Westinghouse and H. Luton	
	of TVA on 6-2-86.	
-	(6) <u>Qualification Report WCAP-8687, Supp. 2-E07A, para. 4.2.3</u>	R
	page o.	

PAGE B-19 RI

					124878
TEMPERATURE	ELEMENT	CHECKED	<u></u>	DATE <u>6/11</u>	<u>/88_74742</u> 1-4-89
H. AGING	(Continued)				
(7) Op	erational Stress Ag	ing:			
. (a	Were the effects operational stree operation adress (Yes/No/NA)? Ye WCAP-8687 Supp. page 4, para. 5. JUSTIFICATION/CO	of electric sses induced ed in the qu <u>s</u> (Referen <u>2-EO7A, para</u> <u>2, page 10,</u> MMENTS	al, mecha during m alificati ce: <u>Qual</u> 3.1.2, and para	nical, a ormal an on progr <u>ificatio</u> page 3, <u>5.4, pa</u>	nd proces d abnorma am <u>n Report</u> para. 3.1 ge 11).
(Ъ	 Was the basis for aging identified program (Yes/No/ <u>Report WCAP-8687</u> para. 3.1.5, page 	or stresses i: l and justifi NA)? <u>Yes</u> <u>Supp. 2-E07</u> re 4).	nduced du ed in the (Referen A. para.	uring ope e qualifi ace: <u>Qua</u> 3.1.2.p	rational cation <u>lificatio</u> age 3, ar
	JUSTIFICATION/CO	MMENTS			
(8) Wa in	the qualified lift the qualification deference: <u>Qualific</u> tra. 3.1.1. pg. 3 &	e of the equ program (Yes ation Report para. 5.1, p ckage EODP-E	ipment ar /No/NA)? <u>WCAP-868</u> z. 10; Ed SE-7, par	nd its ba <u>Yes</u> 37 Supp. Muipment ra. 1.9,	sis defin <u>2-E07A.</u> pg. 4).
(R pa Qu	ATTICALION DALA PA			O VDS	
(R Pa Qu Qu	alified life (Docum	ent in QMDS)	> <i>l</i>	<u> </u>	
(R Pa Qu Qu JU	alified life (Docum	ent in QMDS) S	<u>> l</u>	<u> </u>	<u></u>
(R pa Qu Qu JU	alified life (Docum	ent in QMDS) CS	<u>> //</u>		
(R pa Qu Qu JU	alified life (Docum USTIFICATION/COMMENT	ent in QMDS)	<u>></u>		
(R pa Qu Qu JU	alified life (Docum	ent in QMDS)	<u>> //</u>		
(R pa Qu Qu JU	alified life (Docum	ent in QMDS)	<u>></u> /		

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8-1-4 N

BINDER TI	TLE_INSTRUMENT COMPUTED_HWL DATE 6/10/86 wdv
TEMPERATU	RE ELEMENT CHECKED WBK DATE 6/11/88 2/29/- 1-4-89
H. AGIN	G (Continued)
(9)	Were replacement intervals for the equipment or its component defined in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>See comments</u>
	JUSTIFICATION/COMMENTS Qualified life of test specimen was
	20 years @ normal ambient temperature of 50°C (Refer to
	Equipment Qualification Data Package EQDP-ESE-7, page 17,
	Table 1).
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BIN	ER NO WENED-TTE-004 PLANT	WBN IINTT(S) 1 SHEET 20 OF 43
	110 • <u></u>		R_1_ R_2
BIN	DER TITLEINSTRUMENT	COMPUTED HWL	DATE <u>6/10/86_WCG</u>
TEM	PERATURE ELEMENT	CHECKED <u>WBK</u>	DATE 6/11/86 HDR 97
	· · · · · · · · · · · · · · · · · · ·		1/4/89 1/102
I.	MATERIALS ANALYSIS		
	Identification of Materials	Susceptible to S	ignificant Thermal
	and/or Radiation Degradatio	on and Aging (Use	Section C of Binder
	for Detailed Materials Anal	.ys1s).	
~	Matarial /Droparty/Functio	Radiation	Activation Energy Reference
	Silicon Varnish	(1)	Not (2) para.3.1
	(a) (Cable Costing)		(3) Specified pg 3
	(a) <u>(Gable Coating)</u>	(4)	para.3.1.
	(b) Enory (Potting Mat1)		93eV pg 3
	() <u>hpoxy (roccang nact)</u>		
	(c)		· · · · · · · · · · · · · · · · · · ·
	(d)		· · · · · · · · · · · · · · · · · · ·
	(e)		
	JUSTIFICATION/COMMENTS (]	.) Cable assembly	8 is qualified to 1.22x10
	rade Defer to Sheet 17 (lonnont (A) this	TAD for Tustification
-21-	$\frac{rads.}{(2)}$	Somment (4), this	TAB FOR JUSTIFICATION.
	The silicon varnish is	only used as a ma	nufacturing process to
	prevent the fiber glass ins	sulation of the ca	ble from frying during
	manufacturing and is not re	quired for operat	ion of RTD.
	(3)		
	Qualification_Report WC	<u>AP-8687, Supp. 2-</u>	-E07A, para. 3.1.1.,
	pg. 3.		
	(4) <u>Epoxy as part of RTD as</u>	sembly is qualifi	ed to 1.56x10 rads.
	Refer to Qualification Repo	ort WCAP-8687 Sur	D. 2-E07A DATA 5 3
			<u> </u>
	page 11. Also refer to TAP	<u>E, sect. 7, for</u>	epoxy location.
	,		
	·		
/ !	00330		
WBEP-			
WBEP-	F	AGE B-22	R2

<u></u>	ERTUR	<u>E ELEMENT</u> CHECKED <u>WBK</u> DATE <u>6/11/86</u> /-4-89
J.	<u>EQUI</u> <u>PERF</u>	PMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE ORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIC
	(1)	Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (Yes/No/NA)? <u>Yes</u> (Reference: <u>Equipment Qualification Data Package EODP-ESE-7</u> , Sect. 1.7, pg. 3; Qualification Report WCAP-8687 Supp. 2-E07A, para. 3.2, pg. 5).
		Identify Acceptance Criteria: $\pm 0.2^{\circ}F$ Repeatability, $\pm 1.0^{\circ}F$ drift allowance; insulation resistance > 1 megohn.
	(2)	Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report WCAP-8687, Supp. 2-E07A,</u> para. 3.2, page 5).
		Identify baseline and functional testing: <u>Refer to Sheet 22</u>
		this TAB,
		JUSTIFICATION/COMMENTS
	(3)	Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (Yes/No/NA)? <u>NA</u> (Reference: <u>Equipment Qualification Data Package EQDP-ESE-7,</u> para. 1.1, pg. 2).
		JUSTIFICATION/COMMENTS For electrical connections, refer to
		Sheet 22 this TAB.

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BINDER	NO. <u>WBNEQ-ITE-004</u> PLANT WBN UNIT(S) 1 SHEET 22 OF 43 R / R
BINDER	TITLE INSTRUMENT COMPUTED HWL DATE 6/10/86 AUCO
TEMPERA	ATURE ELEMENT CHECKED WBK DATE 6/11/86 2692
	J. EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS (CONTINUED)
J.(2)	Baseline Functional Tests (Operation - Normal Condition) are des- cribed in the Equipment Qualification Data Package EQDP-ESE-7, R1 page 9. para. 2.9. For Baseline Functional Tests results and for Functional Tests (Static Calibration) results performed after each of the test phases refer to Qualification Report WCAP-8687 Supp. 2-E07A. Appx. C. pp. 57 through 60. R1
J.(3)	During static calibration checks, the RTD(s) were excited by a constant current (approx. 1 mA, refer to Equipment Qualification Data Package EODP-ESE-7, page 2, para. 1.1) applied to two leads [R1 while the voltage drop was measured across the other two leads. A digital voltmeter was used to measure resistance. Refer to Qualification Report WCAP-8687 Supp. 2-E07A, page 6, para. 4.2.1 [R1 and page 31. Figure 4. During each of test phases, the RTD out- puts were monitored via Westinghouse 7300 Series amplifiers. The O-10 volt analog outputs of the amplifiers were monitored and recorded on a digital data logger. Refer to Qualification Report WCAP-8687 Supp. 2-E07A, page 5, para. 3.2 and pages 7 through 9 [R1]
	WUAR-000/ Supp. 2-EU/A, page 5, para. 3.2 and pages / through 9, $ R $

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BINDER TI	ITLEINSTRUMENT	COMPUTED HWL DATE	9/11/86 200
TEMPERATI	URE ELEMENT	CHECKED <u>WCG</u> DATE	9/17/86 201 1-4-89
J. <u>EQUI</u> <u>PERI</u> (Cor	IPMENT ELECTRICAL C FORMANCE SPECIFICAT ntinued)	HARACTERISTICS NECESSARY TO TONS CAN BE SATISFIED UNDER	ENSURE THE ACCIDENT CONE
· (4)	Do the applied lo operating conditi	ads during baseline testing ons (Yes/No/NA)? <u>NA</u> (Ref	reflect norma erence: <u>Refe</u>
	J.(3) Sheet this	TAB.	
	JUSTIFICATION/COM	MENTS	
(5)	Identify electric	al characteristics necessary	to ensure th
	(a) <u>Parameter</u>	Plant Normal Conditions	
	Voltage	R/I Converter with 1 milliamp current	(1)
	Load	NA	(1)
	Frequence	NA	(1)
	Accuracy	(2)	(2)
ч 	Other(s)		
		(1)	
	JUSTIFICATIO	N/COMMENTS <u>Equipment Q</u>	ualification (2)
		-ESE-7, para. 1.1, page 2.	Refer to
	Package KUDP	1 774 7	
- -	Sheet 25, th	is TAB.	·····
	Sheet 25, th	is TAB.	
	<u>Sheet 25, th</u>	nis TAB.	
	<u>Package EQDP</u> <u>Sheet 25, th</u>	is TAB.	

BINDER TI	TLE INSTRUMENT	COMPUTED HWL DATE	<u>9/11/86_WCG</u> 12/20/8
TEMPERATU	JRE ELEMENT	CHECKED WCG DATE	<u>9/17/86 HDR</u> 1/4/89
J. <u>EQUI</u> <u>PERI</u> (Cor	IPMENT ELECTRICAL FORMANCE SPECIFICA Itinued)	CHARACTERISTICS NECESSARY TO ATIONS CAN BE SATISFIED UNDER	ENSURE THE ACCIDENT CONDI
(b)	Parameter	Specific Accident Conditions	<u>Referen</u>
2	Voltage	<u>l milliamp current</u>	
	Load	NA	(1)
	Frequency	NA	(1)
	Accuracy	(3)	(3)
	Other(s)		
		(1) OMMENTS Equipment Qualif	ication Data Pa
	age EODP-ESE-7, gram Dwg. 47W6,	(2) Electri 10-68-5, -74, -1. (3) The d	cal Control Dia emonstrated 20
	age EQDP-ESE-7, gram Dwg. 47W6, accuracy of ± 24 for RTDs 1-TE-7 accuracy (refer FOR RTDs 1	para 1.1, p. 2. (2) Electri 10-68-5, -74, -1. (3) 10-68-5, -74, -1. The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C. Page C-47). (SEE C -7E - 68 - 3/4 - 324).	cal Control Dia emonstrated LO 24 and ±10.85°B he required Dpen /TEM No. /
(c)	age EQDP-ESE-7. gram Dwg. 47W6. accuracy of ± 24 for RTDs 1-TE-7. accuracy (refer FOR RTDs 1. Parameter	para 1.1, p. 2. (2) Electri 10-68-5, -74, -1. (3) The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C, Page C-47). .7E-68-3/9, -324). Demonstrated Conditions	cal Control Dia emonstrated LO 24 and ±10.85°1 he required Open /Tem No. / Referen
(c)	age EQDP-ESE-7, gram Dwg. 47W6, accuracy of ± 24 for RTDs 1-TE-7, accuracy (refer FOR RTDs /- Parameter Voltage	para 1.1, p. 2. (2) Electri (3) (3) The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C, Page C-47). (See C -7E-68-3/9, -324). Demonstrated Conditions R/I Converter with 1 milliamp current	<u>cal Control Dia</u> <u>emonstrated 40</u> 24 and ±10.85°) he required Deen /Tem No. / <u>Referen</u> (1)
(c)	age EQDP-ESE-7, gram Dwg. 47W6, accuracy of ±24 for RTDs 1-TE-7 accuracy (refer FOR RTDs / Parameter Voltage Load	para 1.1, p. 2. Electri (3) 10-68-5, -74, -1. The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C, Page C-47). (SEE C -7E-68-3/9, -324). Demonstrated Conditions R/I Converter with 1 milliamp current NA	$\frac{\text{cal Control Dis}}{\text{emonstrated } \angle O}$ $\frac{24 \text{ and } \angle 10.85^{\circ}}{\text{he required}}$ $\frac{\text{he required}}{\text{PEN / TEM No. / O}}$ $\frac{\text{Referend}}{(1)}$
(c)	age EQDP-ESE-7, gram Dwg. 47W6, accuracy of ± 24 for RTDs 1-TE-7, accuracy (refer FOR RTDs / Parameter Voltage Load Frequency	para 1.1, p. 2. (2) Electri (3) 10-68-5, -74, -1. (3) 10-68-5, -74, -1. The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C, Page C-47). SEE C -7E-68-319, -324). Demonstrated Conditions R/I Converter with 1 milliamp current NA	$\frac{\text{cal Control Dis}}{\text{emonstrated } 40}$ $\frac{24 \text{ and } \pm 10.85^{\circ}}{\text{he required}}$ $\frac{24 \text{ and } \pm 10.85^{\circ}}{\text{he required}}$ $1000000000000000000000000000000000000$
(c)	age EQDP-ESE-7, gram Dwg. 47W6, accuracy of ±24 for RTDs 1-TE-7 accuracy (refer <i>FOR RTDs /</i> Parameter Voltage Load Frequency Accuracy	para 1.1, p. 2. (2) Electri (3) 10-68-5, -74, -1. The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C, Page C-47). SEE C -7E-68-319, -324). Demonstrated Conditions R/I Converter with 1 milliamp current NA (2)	$\frac{\text{cal Control Dis}}{\text{emonstrated } \angle O}$ $\frac{24 \text{ and } \angle 10.85^{\circ}}{10.85^{\circ}}$ $\frac{\text{he required}}{10}$ $\frac{\text{Referen}}{(1)}$ (1) (1)
(c)	age EQDP-ESE-7, gram Dwg. 47W6, accuracy of ± 24 for RTDs 1-TE-7 accuracy (refer <i>FOR RTDs /</i> Parameter Voltage Load Frequency Accuracy Other(s)	para 1.1, p. 2. (2) Electri (3) 10-68-5, -74, -1. The d .2°F for RTDs 1-TE-68-319, -3 4-14, -25 is acceptable for t to TAB C, Page C-47). SEE C -7E-68-319, -324). Demonstrated Conditions R/I Converter with 1 milliamp current NA (2)	$\frac{\text{cal Control Dia}}{\text{emonstrated } 40}$ $\frac{24 \text{ and } \pm 10.85^{\circ}\text{B}}{10.85^{\circ}\text{B}}$ $\frac{\text{he required}}{100000000000000000000000000000000000$

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BINDER NO.WBNEO-ITE-004 PLANT	WBN	UNIT(S)1	
		_		R_1R_2_/
BINDER TITLE INSTRUMENT	COMPUTED	HWL	DATE <u>9/</u>	11/86 WCG CAR
				12/20/88 7/12/90
TEMPERATURE ELEMENT	CHECKED	WCG	DATE 9/	17/86 HDR AFM
				1/4/89 7/16/90
J. EOUIPMENT ELECTRICAL C	HARACTERIS	TICS NECE	SSARY T	O ENSURE THE
PERFORMANCE SPECIFICAT	TIONS CAN BI	E SATISFI	ED UNDE	R ACCIDENT
CONDITIONS (Continued))			
	-	1		
(c) Accuracy - There a	re_no_chang	<u>ges in th</u>	e RTD d	<u>ue to severe</u>
environments. The cal	libration a	<u>ccuracy</u> i	s ± 0.2	°F_and_the
\$	~			
drift allowance is ± 1	L.O°F (Refe	<u>r to Equi</u>	pment Q	ualification

Data Package EQDP-ESE-7, Table 1, page 17). Additional

allowances of $\pm 2.0^{\circ}$ F for environmental effects and $\pm 0.2^{\circ}$ F

for sensor drift to be included in Westinghouse's Safety

Supp. 2-E07A, page 18). For demonstrated loop accuracy

R2

Analyses (Refer to Qualification Report WCAP-8687

refer to Instrument Accuracy Calculations Summary

TAB C. Page C-47.

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	<u>RE ELEMENT</u> CHECKED WCG DATE <u>9/17/86</u> /-4-89	
K. 1 <u>REQ</u>	UIRED OPERATING ENVIRONMENT 1-TE-68-319	
Refe	rence Environmental Drawing No. <u>47E235-42</u>	
· (1)	Normal Max (2) Abnormal Max	
	(a) Temperature (°F) 120 (a) Temperature (°F) 130	(1
	(b) Pressure (psig) <u>.3</u> (b) Pressure (psig) <u>.3</u>	
	(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>100</u>	
	(d) Radiation (rd) $\frac{7}{2x10}$ (d) Radiation (rd) <u>NA</u>	····
(3)	Process Interfaces: <u>NA, RTDs are installed in thermowells</u>	
	For effects of process temperatures, refer to Sheet 27,	
	commont 1 this tab	
(4)	State anticipated occurrence frequency and duration of abnoconditions: <u>Maximum abnormal temperature</u> , pressure and <u>humidity could exist for up to eight hours per excursion and the state of the state</u>	orn
(4)	State anticipated occurrence frequency and duration of abn conditions: <u>Maximum abnormal temperature</u> , pressure and <u>humidity could exist for up to eight hours per excursion an</u> will occur less than 1% of plant life.	orn
(4)	State anticipated occurrence frequency and duration of abn conditions: <u>Maximum abnormal temperature</u> , pressure and <u>humidity could exist for up to eight hours per excursion an</u> will occur less than 1% of plant life. Accident (worst case for any combination of specified acci- parameter including peak, duration, and profile):	orn nd
(4) (5)	State anticipated occurrence frequency and duration of abn conditions: <u>Maximum abnormal temperature</u> , pressure and <u>humidity could exist for up to eight hours per excursion a</u> will occur less than 1% of plant life. Accident (worst case for any combination of specified acci- parameter including peak, duration, and profile): (a) Temperature (°F) <u>327</u> (1) Accident type <u>HELB</u>	orn nd
(4) (5)	Comment 1. this tap. State anticipated occurrence frequency and duration of abnormal temperature, pressure and conditions: Maximum abnormal temperature, pressure and humidity could exist for up to eight hours per excursion and humidity could exist for up to eight hours per excursion and will occur less than 1% of plant life. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile): (a) Temperature (°F) 327 (b) Pressure (psig) 11.2 Accident type LOCA	orm nd
(4) (5)	Comment 1: this tap: State anticipated occurrence frequency and duration of abnormal temperature. pressure and humidity could exist for up to eight hours per excursion at will occur less than 1% of plant life. Accident (worst case for any combination of specified accider parameter including peak, duration, and profile): (a) Temperature (°F) 327 (b) Pressure (psig) 11.2 (c) Humidity (%) 100 Accident type LOCA/H	orn nd der
(4) (5)	Comment 1. this tay. State anticipated occurrence frequency and duration of abnomal temperature. pressure and humidity could exist for up to eight hours per excursion and humidity could exist for up to eight hours per excursion and will occur less than 1% of plant life. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile): (a) Temperature (°F) 327 (b) Pressure (psig) 11.2 (c) Humidity (%) 100 Accident type LOCA/H 4.7x10 ⁸ beta	orn nd der
(4) (5)	State anticipated occurrence frequency and duration of abn conditions: Maximum abnormal temperature, pressure and humidity could exist for up to eight hours per excursion a: will occur less than 1% of plant life. Accident (worst case for any combination of specified acci parameter including peak, duration, and profile): (a) Temperature (°F) 327 (1) Accident type HELB (b) Pressure (psig) 11.2 Accident type LOCA (c) Humidity (%) 100 Accident type LOCA/H 4.7x10 ⁸ beta (d) Radiation (rd) 4x10 ⁷ gamma	orm nd den
(4)	State anticipated occurrence frequency and duration of abn conditions: Maximum abnormal temperature, pressure and humidity could exist for up to eight hours per excursion at will occur less than 1% of plant life. Accident (worst case for any combination of specified acci parameter including peak, duration, and profile): (a) Temperature (°F) 327 (b) Pressure (psig) 11.2 (c) Humidity (%) 100 Accident type LOCA (d) Radiation (rd) $4x10^7$ gamma (a) Spray Type Boron (2) Accident type LOCA (c) Spray Type Boron	orn nd der

PAGE B-28 RI

•	BINDER	NO.W	BNEQ-ITE-004 PI	ANT <u>WE</u>	SN	UNIT	(S) <u>1</u> SHEET2	6A_OF_43_
	BINDER	TITL	EINSTRUMENT	co	MPUTED <u>/R/</u>	1UC92	DATE)-12-57	
	<u>TEMPER</u>	ATURE	ELEMENT	CH	iecked <u>/RI</u>	HOR	_ DATE <u>[-12-89</u>	
	K. 2	REQU	IRED OPERATING E	NVIRONM	i <u>ent</u> 1–t	E-68-3	324	
		Refe	rence Environmen	ital Dra	wing No.	<u>47E2</u>	35-41	-
	•	(1)	Normal Max		(2)	Abnor	rmal Max	
			(a) Temperatur	e (°F)	110 ⁽¹⁾	(a)	Temperature (°F)	<u>120⁽¹⁾</u>
			(b) Pressure (psig)	0.3	(b)	Pressure (psig)	
			(c) Humidity ((%)	80	(c)	Humidity (%)	90
			(d) Radiation	(rd)	<u>1x10⁶</u>	(d)	Radiation (rd)	<u>NA</u>
		(3)	Process Interfa	ices: <u>N</u>	IA, RTDs a	<u>re in</u>	stalled in thermow	vells.
			For effects of	process	temperat	ures,	refer to Sheet 27	·
			comment 1. this	TAB.				
		(4)	State anticipat abnormal condit	ed occu ions:	urrence fr <u>Maximum a</u>	equeno bnorma	cy and duration of al temperature, pr	essure
			and humidity co	uld exi	st for up	to e:	ight hours per exc	ursion
		-	and will occur	<u>less th</u>	an 1% of	plant	life.	
		(5)	Accident (worst accident parame	case f	for any co luding pe	mbina ak, dı	tion of specified iration, and profi	.le):
		. •	(a) Temperatur	e (°F)	(1)		Accident type	HELB
			(b) Pressure ((psig)	11.2		Accident type	LOCA
			(c) Humidity ((%)	100		Accident Type	<u>loca/he</u> lb
					4.7x10 ⁸ B	eta		
			(d) Radiation	(rd)	<u>3.8x10⁷ G</u>	amma	Accident type	LOCA
			(e) Spray Type) *	Boron (2	.)	Accident type	LOCA_
		(1)(2) Refer to Shee	et 27, t	his TAB.			
\bigcirc						_		
				AUE.	13-28A	RI		

THE PARTY AND A	
	TURE ELEMENT CHECKED WCG DATE 9/1//86 7/194C
K.	REQUIRED OPERATING ENVIRONMENT (Continued) (1) Qualification Report WCAP-8687 Supp 2-E07A, para. 5.1,
	p. 10 denotes a 50°C temperature rise, due to the effects of
	the Reactor Coolant System temperature, was used in determining
	qualified life. Westinghouse has performed an analysis
	(Cal-note SEC-OSA-1242-CO- on file at Westinghouse) that
	demonstrates that the air velocity and the ambient temperature
	of the area are sufficient to limit the temperature of the
	RTD's head to 200°F.
	(2) Refer to Sheet 33, this TAB, for Composition.
	(2) Refer to Sheet 33, this TAB, for Composition.
	(2) Refer to Sheet 33, this TAB, for Composition.



TEMPERATIRE			$\frac{1}{12} = \frac{1}{12} $	
			DATE <u>2/ 1//0</u> 0 <u>/40</u> /-4-	89
K. 3 <u>REQUI</u>	RED OPERATING ENVIRONM	<u>1ent</u> 1-te-74-	-14, -25	
Refer	ence Environmental Dra	awing No. <u>47E2</u>	35-50	
(1)	Normal Max	(2) Abn	ormal Max	
	(a) Temperature (°F)) <u>104</u> (1) (a)	Temperature (°F)	<u>110</u>
	(b) Pressure (psig)	<u>ATM(-)</u> (b)	Pressure (psig)	<u>ATM(</u>
	(c) Humidity (%)	<u>80</u> (c)	Humidity (%)	9
	(d) Radiation (rd)	$\frac{4.3 \times 10^5}{(d)}$	Radiation (rd)	<u>N</u>
(3)	Process Interfaces:	NA, RTDs are i	nstalled in thermov	wells.
	For effects of proces	<u>ss temperatures</u>	refer to Sheet 14	4,
	comment 2, this TAB.			.
(4)	State anticipated occ abnormal conditions:	urrence freque <u>Maximum abnor</u>	ncy and duration of mal temperature and	E 1
	humidity could exist	for up to eigh	t hours per excurs:	ion
	and will occur less t	<u>:han 1% of plan</u>	t life.	
(5)	Accident (worst case accident parameter in	for any combin cluding peak,	ation of specified duration, and profi	ile):
	(a) Temperature (°F)	. <u>NA</u>	Accident type	_LOCA
	(b) Pressure (psig)	NA	Accident type	LOCA
	(c) Humidity (%)	NA	Accident Type	LOCA
	(d) Radiation (rd)	1x10	Accident type	LOCA
	(e) Spray Type	NA	Accident type	NA
(1)	Refer to Sheet 17, Com	ment 2, this T	AB.	

PAGE B-30
BINDER TITLE INSTRUMENT COMPUTED HML DATE 9/11/180 Here TEMPERATURE ELEMENT CHECKED WCG DATE 9/11/180 Here K. REQUIRED OFERATING ENVIRONMENT (Continued) Comments (duration/peak/profile/spray composition and pH, margin, etc.): Refer to Sheet 33 this TAB for spray composition and pH.	BINI	DER NO	. <u>WBNEQ-ITE-004</u> PLANT_	WBN	UNIT(\$	5) <u> </u>	RR
TEMPERATURE ELEMENT CHECKED_WCG	BINI	DER TI	TLE <u>INSTRUMENT</u>	COMPUTED	HWL	DATE <u>9/11</u>	186 16-18 14 -
K. REQUIRED OPERATING ENVIRONMENT (Continued) Comments (duration/peak/profile/spray composition and pH, margin, etc.): Refer to Sheet 31 this TAB for spray composition and pH. (6) Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? Yes_ (Reference: Refer HOW h here and the performance of the equipment subject to submergence (Yes/No/NA)? Yes_ (Reference: Refer to Sheet 30 this TAB.). (7) Subject to submergence (Yes/No/NA)? Yes_ (Reference: Refer to Sheet 30 this TAB.). (8) Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? Yes_ (Reference: Environmental data drawing 4/E235-50). If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: NA - Refer to Sheet 30 this TAB. (9) Special environmental calculations (temp., rad., etc.) Type RIMS NO.	TEMI	PERATU	RE ELEMENT	CHECKED	WCG	DATE <u>9/17</u>	<u> 86 01 </u> -4-89
Comments (duration/peak/profile/spray composition and pH, margin, etc.): Refer to Sheet 33 this TAB for spray composition and pH. (6) Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? Yes_ (Reference: Refer profile/spray of p	ĸ.	REQU	IRED OPERATING ENVIRON	MENT (Cont	inued)		
composition and pH. (6) Is the equipment subject to moisture or liquid intrusion whi can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? <u>Yes</u> (Reference: <u>Refer</u> #00% h_mint #01% h_mint			Comments (duration/pe margin, etc.): <u>Refer</u>	ak/profile/	spray co 3 this 2	omposition TAB for sp	and pH, pray
 (6) Is the equipment subject to moisture or liquid intrusion whican affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? Yes_ (Reference: Reference) State of the submergence (Yes/No/NA)? Yes_ (Reference: Reference) State of the submergence (Yes/No/NA)? Yes_ (Reference: Reference) State of the submergence (Yes/No/NA)? Yes_ (Reference: Reference) (Reference: Reference) (Reference: Reference) (Reference: Reference) (Reference: Reference) (Reference: Euvironmental data drawing 4/E235-50). If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: NA - Reference State 30 this TAB. (9) Special environmental calculations (temp., rad., etc.) Type RIMS No. 			composition and pH.				<u></u>
 (6) Is the equipment subject to moisture or liquid intrusion whi can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? <u>Yes</u> (Reference: <u>Refer</u> (7) Subject to submergence (Yes/No/NA)? <u>Yes</u> (Reference: <u>Refe</u> (7) Subject to submergence (Yes/No/NA)? <u>Yes</u> (Reference: <u>Refe</u> (7) Subject to submergence (Yes/No/NA)? <u>Yes</u> (Reference: <u>Refe</u> (8) Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>Environmental data drawing 47E235-50</u>). (7) If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA -</u> Refer to Sheet 30 this TAB. (9) Special environmental calculations (temp., rad., etc.) Type <u>RIMS No.</u> 		~	-		·		<u></u>
<pre>Hoff h **********************************</pre>		(6)	Is the equipment subj can affect the perfor accident conditions (ect to mois mance of th Yes/No/NA)?	ture or e equip: <u>Yes</u>	liquid in ment under (Referen	trusion whi design bas ce: <u>Refer</u>
(7) Subject to submergence (Yes/No/NA)? Yes (Reference:		HOR	h 3-11-59 Speet 30 this TAB				
to Sheet 30 this TAB.). Identify initiation time and duration of submergence:		3-11-6 (7)	Subject to submergence	e (Yes/No/N	A)? <u>Yes</u>	(Refer	ence: <u>Refe</u>
Identify initiation time and duration of submergence:			to Sheet 30 this TAB.	.).			
(8) Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>Environmental data drawing 47E235-50</u>). If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA -</u> <u>Refer to Sheet 30 this TAB.</u> <u></u>			Identify initiation t	ime and dur	ation of	f submerge	nce:
(8) Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>Environmental data drawing 47E235-50</u>). If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA -</u> <u>Refer to Sheet 30 this TAB.</u> (9) Special environmental calculations (temp., rad., etc.) <u>Type</u> <u>RIMS No.</u>							
(8) Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>Environmental data drawing 47E235-50</u>). If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA -</u> <u>Refer to Sheet 30 this TAB.</u> (9) Special environmental calculations (temp., rad., etc.) <u>Type</u> <u>RIMS No.</u> <u></u> 			······································				
If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA -</u> <u>Refer to Sheet 30 this TAB.</u> (9) Special environmental calculations (temp., rad., etc.) <u>Type</u> <u>RIMS No.</u>		(8)	Is the equipment subj the total accident do (Reference: <u>Environm</u>	ect to a be se (Yes/No/ ental data	ta radia NA)? <u> </u>	ation cont (es 47E235-50	ribution to
Refer to Sheet 30 this TAB.			If yes, identify the beta dose to be added	fraction of to the tot	the una al dose	attenuated and justi	free field fy: <u>NA -</u>
(9) Special environmental calculations (temp., rad., etc.) Type RIMS No.			Refer to Sheet 30 thi	s TAB.			
(9) Special environmental calculations (temp., rad., etc.) Type RIMS No.							
(9) Special environmental calculations (temp., rad., etc.) Type RIMS No.			·				
Type RIMS No.		(9)	Special environmental	calculatio	ns (temp	., rad.,	etc.)
			Type			RIMS No	<u>•</u>
						·	
							· · · ·

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BINDER NO. WBNEQ-ITE-004 PLANT	WBN UNIT(S) 1 SHEET 30 OF 43
BINDER TITLE INSTRUMENT	COMPUTED HWL DATE $\frac{1}{9/11/86} \frac{1}{1000} \frac{1}{10000000000000000000000000000000000$
TEMPERATURE ELEMENT	CHECKED WCG DATE <u>9/17/86</u>
K. <u>REQUIRED OPERATING ENVI</u>	RONMENT (Continued)
<u>K. (6) Reference - Envi</u>	ronmental Data Drawings 47E235-42
(Note 46) and -50 (Note	<u>. 48).</u>
<u>K. (7) Reference - RTDs</u>	1-TE-68-319, -324 are located above
surge flood level of 72	22'. RTDs 1-TE-74-14, -25 are located
1'1" below the RHR HELB	flood level (the only event causing
flooding on elevation 7	13. room A12 per environmental drawing
47E235-50). The RTD's	are not required to function for this
<u>event per OE calcualtio</u>	n WBNOSG4-020 - Category and Operating
<u>Times (see Section A, t</u>	this TAB).

PAGE	<i>B</i> -32	RI
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דזגד ק	ייתידיתי מיזרי		OOMDII		R_/_R
DTM	DER III.	LE_INSIRUMENI		<u>HWL</u> DATI	<u>9/11/86</u>
TEMI	PERATUR	E ELEMENT	CHECKED_	WCG DATI	2 <u>9/17/86 2/01</u>
L.	<u>SUMMA</u> 1-TE-	RY COMPARISON OF 3 68-319, 324	TEST CONDITIC	NS TO SPECIFII	ED CONDITIONS
	(1)	Comparison of wors	st-case maxim	um parameters:	:
		Parameter	Specified	Demonstrated	Reference
	(Operating Time	<u>100 days</u>	<u>15 days</u>	Tab C, Sect. 3(1) Fig. 7, pg. 34
·		Temperature (°F)	_327	_420	Fig. 7, pg. 34 ⁽¹⁾ Table 1, pg. 17
	1	Pressure (psig)		75	Fig 9, pg. 36 ⁽¹⁾ Table 1. pg. 17 ⁽²
	1	Relative Humidity (%)	100	100	<u>Table 1, pg. 17</u> (2
	. (Chemical Spray*	Sheet 33 this TAB	Sheet 33 this TAB	Para. 3.1.7, pg. Table 1, pg. 17
-			6x10 ⁷ gamm	a	Table 1, pg. 17 ⁽²
	1	Radiation (rd)**	<u>4.7x10 b</u> e	t <u>a (3)</u>	Para. 5.3, pg. 11
	S	Submergence	<u>NA</u>	• • • • • • • • • • • • • • • • • • • •	
	*: **! (2) (Includes spray com pH. Enter 40-year inte dose and specify t Comparison of wors	egrated norma Type.	flowrate, dens 1 dose plus in 1es and margin	ity, duration, and tegrated accident assessment:
		Parameter	Test P Envelopes (Yes/	rofile Specified No/NA)	Reference
	2	Temperature	Yes		Fig. 7, pg. 34 ⁽¹⁾ Table 1, pg. 17 ⁽²
	I	Pressure	Yes		Fig. 9, pg. 36 ⁽¹⁾ Table 1, pg. 17 ⁽²
	F	Relative Humidity	Yes		(<u>Table 1, pg. 17</u>
	(Chemical Spray	No		<u>Sheet 33 this T</u> AB
	_	7 1		•	

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•	BINDER NO.WBNEQ-ITE-004 PLANT_WBN UNIT(S) 1 SHEET 32 OF 43
	BINDER TITLE INSTRUMENT COMPUTED HWL DATE 6/10/86 WCG
	12/20/88 112/94 TEMPERATURE ELEMENT CHECKED WBK DATE 6/12/86 HDR AFM 1/4/89 7/16/50
	L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS</u> (Continued)
	(1) Qualification Report WCAP-8687, Supp. 2-E07A.
	(2) Equipment Qualification Data Package EQDP-ESE-7.
	(3) a)RTD TIP - 1.56x10 ⁸ rads gamma.
	b)Cable - 8.64x10 ⁶ rads gamma. However, the cable is
	identical in design and makeup to the RdF Model 21205
	cable. Therefore, qualified radiation exposure limits
	of 1.22x10 ⁸ rads gamma are acceptable limits (Refer to
	TAB E, Section 5, letter from Westinghouse to D. W.
	Wilson, Dtd. 3-20-86. RIMS No. B71 860403 004).
	Qualification of the Model 21205 RTD/Cable Assembly is
	documented in EQ Binder WBNEQ-ITE-003. CAN 7/12/90 c)No actual Beta irradigation was performed. However, the R ²
	cable is identical in design and makeup to the RdF
	Model 21205 RTD cable (Refer to TAB E, Sect. 5, letter
	to D. W. Wilson Dtd. 3-20-86, RIMS No. B71 860403 004).
	The RTD probe contains no aging sensitive materials R2
	(materials consist of stainless steel, platinum wire
	and magesium oxide). Therefore, the qualified radiation
	exposure limits of 9.13x10 ⁸ rads beta for the RdF R^2
	Model 21205 RTD/Cable Assembly as documented in EQ Binder
	WBNEQ-ITE-003, are acceptable limits for the RdF Model
	21232 RTB/Cable Assembly.
	· · ·
	WBEP-0021Q PAGE 3-34 R2

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BINDER NO.WB	NEQ-ITE-004 PLANT_WBNUNIT(S)_1SHEET_33_OF_4;	2
BINDER TITLE	INSTRUMENT COMPUTED HWL DATE 9/11/86 40000	
TEMPERATURE	ELEMENT CHECKED WCG DATE 9/17/86 Hore	
]
L.(1) S	UMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS - OMPARISON OF WORST-CASE PROFILES AND MARGIN ASSESSMENT	-
C	hemical Spray	
S	pecified - The chemical spray composition is 0.19 molar	

 H_3BO_3 (2000ppm Boron), 0.003 molar NaOH resulting in a pH of 8.3 at 25°C. The flow rate is equal to 0.92 gal/min per square foot of containment cross section. Refer to Environmental Data Drawings 47E235-41 and -42, Notes 5 and 22 (Both Drawings).

Demonstrated - The chemical spray composition consisted of 2750ppm Boron buffered with 0.9 percent dissolved NaOH to a pH of 10.7 at 25°C and was applied from the start of HELB simulation to 24 hours. The flow rate was not specified. Refer to TAB C, Section 2 for acceptability.

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	BINDER TITLE INSTRUMENT COMPUTED HWL D	R ATE <u>9/11/86</u>	R 102.9
	TEMPERATURE ELEMENT CHECKED WCG D	ATE <u>9/17/8</u> 62	1-12-57 7/0K
		/-	12-89
	L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SPECI</u> (Continued)	FIED CONDITI	ONS
	(3) Were margins applied to the test paramete addressed in the test program to assure t and uncertainties are accounted for? (No Yes/No/NA).	rs or otherw hat normal v te margin ap	rise ariation plied,
- مىن	Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/N
	Temperature: +15 degrees F	> <u>15°F</u>	Yes
	Pressure: +10% but no more than 10 psig	>10%	Yes
	Radiation: +10% of accident dose	>10%	Yes
	Time: +10% (or 1 hour + operating time per NUREG-0588)	No	(3)
	Voltage: ±10% of rated value	<u>NA</u>	
	Frequency: ±5% of rated value	NA	
	Environmental Transient: the initial transient and the peak temperature applied twice	(1) Yes	Yes
	Vibration: +10% added to acceleration	(2)	Yes
	JUSTIFICATION/COMMENTS (1) Qualification	Report WCAP	-8687,
	Supp. 2-E07A, Figure 7, page 34.	<u>ipment Quali</u>	fication
	Data Package EQDP-ESE-7, paragraph 2.10.3	.3, page 11.	
	Refer to TAB C, Section 3 Material Ag	ing Calculat	ion
	Report WAC-191 for plant specific applied	margin.	
	· · · · · · · · · · · · · · · · · · ·	<u></u>	
			······································

BIND	ER TITLE INSTRUMENT	COMPUTED	HWL DATE	6/10/86 the
TEMP	ERATURE ELEMENT	CHECKED_	WBK DATH	: <u>6/11/86_7/9/2</u> 1-4-89
L.	SUMMARY COMPARISON OF TE 1-TE-74-14, -25	ST CONDITIO	NS TO SPECIFIE	D CONDITIONS
	(1) Comparison of worst	-case maxim	um parameters:	
\$	Parameter	Specified	Demonstrated	Reference
	Operating Time	<u>100 days</u>	<u>15 days</u>	Tab C, Sect. 3 Fig. 7, pg. 34 ⁽¹
	Temperature (°F)		420	Fig. 7, pg. 34 ⁽¹⁾ Table 1, pg. 17
	Pressure (psig)		75	Fig 9, pg. 36 ⁽¹⁾ Table 1, pg. 1 ⁷
	Relative Humidity (%)	_90	100	<u>Table 1, pg. 1</u> 7
	Chemical Spray*	NA		Para. 5.3, pg. 1 <u>Table 1, pg. 17</u> (
	Radiation (rd)**	1.043x10 ⁷	(3)	Para. 5.3, pg. 1 Table 1, pg. 17
	Submergence	NA		
	<pre>*Includes spray conc pH. **Enter 40-year integ dose and specify ty</pre>	entration, rated norma	flowrate, dens 1 dose plus in	ity, duration, and tegrated accident
	(2) Comparison of worst	-case profi	les and margin	assessment:
	Parameter	Test P Envelopes (Yes/	rofile Specified No/NA)	_Reference_
	Temperature	Yes		Fig. 7, pg. 34 ⁽¹⁾ Table 1, pg. 17 ⁽²⁾
	Pressure	_Yes		Fig. 9, pg. 36 ⁽¹⁾ Table 1, pg. 17 ⁽²⁾
	Relative Humidity	Yes		<u>Table 1, pg. 17</u>
	Chemical Spray	<u>_NA</u>		

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BINDER NO	. <u>WBNEQ-ITE-004</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>36</u> OF <u>4</u>	3
BINDER TI	TLE_INSTRUMENTCOMPUTED_HWLDATE 6/10/86 wcr	
<u>TEMPERATU</u>	RE ELEMENT CHECKED WBK DATE 6/11/86 1/194	
L.	SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)	
	(1) Qualification Report WCAP-8687, Supp. 2-E07A.	
	(2) Equipment Qualification Data Package EQDP-ESE-7.	21
	⁽³⁾ a)RTD TIP - 1.56x10 ⁸ rads gamma.	
	b)Cable - 8.64×10^6 rads gamma. However, the cable is	
	identical in design and makeup to the RdF Model 21205	
	cable. Therefore, qualified radiation exposure limits	
	of 1.22x10 ⁸ rads gamma are acceptable limits (Refer to	
	TAB E, Section 5, letter from Westinghouse to D. W.	
	Wilson, Dtd. 3-20-86. RIMS No. B71 860403 004).	
	Qualification of the Model 21205 RTD/Cable Assembly is	
	documented in EQ Binder WBNEQ-ITE-003.	

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	RINDER TITLE INSTRUMENT COMPUTED HUI.	R_/ R
	TEMPERATURE_ELEMENT CHECKED_WCG	DATE $\frac{9/17/86}{12739}$
	L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPEC	IFIED CONDITIONS
	(Continued)	
	(3) Were margins applied to the test parameter addressed in the test program to assure and uncertainties are accounted for? (No Yes/No/NA).	ers or otherwise that normal variation ote margin applied,
	Suggested Margins per IEEE-323(74)	Margin <u>Applied Yes/No/N</u>
	Temperature: +15 degrees F	> <u>15°F Yes</u>
	Pressure: +10% but more than 10 psig	> <u>10% Yes</u>
	Radiation: +10% of accident dose	> <u>10% Yes</u>
	Time: +10% (or 1 hour + operating time per NUREG-0588)	<u>No (3)</u>
	Voltage: ±10% of rated value	<u>NA</u>
	Frequency: ±5% of rated value	<u>NA</u>
	Environmental Transient: the initial transient and the peak temperature applied twice	(1) Yes Yes
	Vibration: +10% added to acceleration	(2) Yes
	JUSTIFICATION/COMMENTS (1) Qualification	n Report WCAP-8687,
	Supp. 2-EO7A, Figure 7, page 34. (2)	<u>uipment Qualification</u>
	Data Package EODP-ESE-7, paragraph 2.10.3	3.3. page 11.
	Report WAC-191 for plant specific applied	i margin.
7		

	TEMPERATURE ELEMENT CHECKED WMR DATE 6/11/86 34942 /-4-89
	M. <u>OPERABILITY TEST RESULTS</u>
	(1) Identify the safety function(s) of this equipment: (Reference: <u>Refer to TAB A</u>).
	JUSTIFICATION/COMMENTS
	(2) Did the equipment perform its intended function during the simulated design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>Qualification Report WCAP-8687 Supp. 2-E07A</u> ,
	para. 6.2. pg. 14, and para. 7.2, pp. 17, 18). JUSTIFICATION/COMMENTS
	(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? Yes (Reference: Qualification Report WCAP-8687, Supp. 2-E07A,
	para. 6.2, pg. 14, and para 7.2, pp. 17, 18). JUSTIFICATION/COMMENTS
	(4) Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (Yes/No/NA)? Yes (Reference: <u>Refer to TAB C, ·</u> <u>Section 3</u>).
	JUSTIFICATION/COMMENTS
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BINDER T	ITLEINSTRUMENT	COMPUTEDHWL	DATE <u>6/10/8</u> 6	11-23-75
TEMPERATI	JRE ELEMENT	CHECKEDWBK	DATE <u>6/11/8</u> 6	24912 1-4-89
M. <u>OPE</u>	ABILITY TEST RESULTS	(Continued)		
(5)	Abnormal Conditions: properly addressed a (Reference:	Were abnormal and resolved (Yes	conditions or and s/No/NA)? <u>NA</u>	omalie
	JUSTIFICATION/COMMEN	TS <u>No anomalies</u>	s were noted in Qu	ualifi
	cation_Report_WCAP-8	687 Supp. 2-E074	A or Equipment Qua	alific
	<u>tion Data Package EC</u>	DP-ESE-7.		
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BIND BIND TEMP	ER NO. WBNEQ-ITE-004 PLANT WBN UNIT(S) 1 SHEET 40 OF 43 R R R R R R R R R R R R R R R R R R R
N.	MAINTENANCE AND SURVEILLANCE
	Has the qualification program identified those surveillance, maintenance, and inspection parameters which are essential to maintain qualification and which aid in detecting degrading materials or equipment performance (yes/no/NA)? <u>Yes</u> (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).
	JUSTIFICATION/COMMENTS
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	PAGEB-42

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BIND BIND	ER NO. WBNEQ-ITE-004 PLANT WBN UNIT(S) 1	SHEET <u>41</u> OF <u>43</u> R R
TEMP	PERATURE ELEMENT CHECKED	1-86
0.	SUMMARY OF REVIEW	Yes/No/NA
	(1) Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	<u>Yes</u>
	(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	<u>NA</u>
	(3) Choice of qualification methodology adequately justified?	<u>Yes</u>
	(4) If analysis was performed, complete the following:	
	(a) Were equipment performance requirements identified?	NA
	(b) Were specific features and failure modes and effects analyzed?	<u>NA</u>
	(c) Were assumptions and mathematical models used together with appropriate justification for their use?	<u>NA</u>
	(d) Were environmental parameters which affect equipment performance identified?	<u>NA</u>
	(5) Adequate similarity between equipment and test specimen established?	Yes
	(6) Aging degradation evaluated adequately?	Yes
	(a) Mechanical and/or.cycle aging addressed?	Yes
	(b) Equipment aged to end of life condition prior to application of DBE conditions?	<u>Yes</u>
	(c) Absence of preaging in test/analysis justified?	NA
	<pre>(d) Materials susceptible to thermal/radiation</pre>	Yes

PAGE <u>B-43</u>

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BINDER NO	D. <u>WBNEQ-ITE-004</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SH	IEET_42_0F_43
BINDER T	R_ ITLE <u>INSTRUMENT</u> COMPUTED <u>HWL</u> DATE <u>6/10/8</u> 6	<u></u>
TEMPERATI	URE ELEMENT CHECKED WBK DATE 6/11/86	<u>24242</u> 1-4-89
0. SUMI	MARY OF REVIEW (Continued)	
		Yes/No/NA
	(e) Normally operating state of device (e.g., normally energized) considered?	Yes `
(7)	Qualified life or replacement schedule established?	Yes
(8)	Criteria regarding temperature pressure exposure satisfied?	Yes
	(a) Peak temperature adequate	Yes
	(b) Peak pressure adequate	Yes
	(c) Duration adequate	Yes
	(d) Required profile enveloped adequately	Yes
	(e) Steam exposure adequate	Yes
(9)	Crieria regarding test sequence satisfied?	Yes
(10)	Criteria reqarding spray satisfied?	Yes
	(a) Was the spray testing done while under the extremes of pressure and temperature?	Yes
	 (b) Does the spray concentration, flow rate, No density, duration, and pH used in tests TA meet or exceed those to be used for the 2, plant? 	-Refer to B C, Sect. for ac- ptability
(11)	Criteria regarding submergence satisfied?	Yes
(12)	Criteria regarding radiation satisfied?	Yes
	(a) Was dose rate considered?	Yes
	(b) Was beta radiation considered?	Yes
(13)	Criteria regarding operability status/mode satisfied?	Yes
(14)	Criteria regarding test failures or anomalies satisfied?	Yes

PAGE B-44 RI

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BINDER TITLE INSTRUMENT COMPUTED Kan DATE	R F <u>68-20</u>
TEMPERATURE ELEMENT CHECKED	11-86
0. <u>SUMMARY OF REVIEW</u> (Continued)	Yes/No/NA
(15) Criteria regarding functional testing satisfied?	Yes
(a) Does the test plan/report specify an acceptance criteria for equipment performed?	Yes
(b) Was an initial base line test done to establish required performance characteristics?	Yes
(c) Has the test/analysis demonstrated that performance performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	e <u>Yes</u>
(16) Criteria regarding instrument accuracy satisfied?	Yes
(17) Test duration margin (1 hour + function time) satisfied?	Yes
(a) Is the minimum specified operating time at least 1 hour?	Yes
(b) If exception to the l-hour minimum operating time was taken, was adequate justification provided?	<u>NA</u>
(18) Criteria regarding synergistic effects satisfied?	<u>Yes</u>
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes
P. DISCUSSION	.
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BINDER NO. : WENEG-ITS -00 MANUFACTURER : FENWAL PAGE 1 OF 4 .

WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

		LOCATION				
EQIS_NUMBERUNII. DESCRIPTIONUNII.	DIVICE ID NO	ELEV(1) EMZRAG ÇQUIRACI	<u>CA</u> I (2)	QPER_TIME	EYENI	SAEEIY_EUNCIION
₩BN-1-TS -001-0017A -A 1-TS TEHP SWITCH STN FLOW TO AFPT	-001-0017a -a 17323-0	692• 405 75K13-086422	8	5MIN 1000	AF L	DETECT AFPT ROOM HIGH TEMP TO INITIATE STEAM SUP ISLN. Switch Cannot Fail SU as to Indicate Afpt Room High Temp And Initiate Steam Supply Isln
WBN-1-TS -001-00178 -A 1-TS TEMP SWITCH STM FLOW TO AFPT	-001-00175 -A 17323-0	692* AG6 75 K13-02 64 22	A B	5mn 100d	AF L	DETECT AFPT ROOM HIGH TEMP TO INITIATE STEAM SUP ISLN. SWITCH CANNOT FAIL SO AS TO INDICATE AFPT ROOM HIGH TEMP AND INITIATE STEAH SUPPLY ISLN
WBN-1-TS -001-0018A -B 1-TS TEMP SWITCH STM FLOW TO AFPT	-001-0013A -B 17323-0	692" A06 75 K13-08 6422	A 6	5mn 100d	AF L	DETECT AFPT ROOM HIGH TEMP TO INITIATE STEAM SUP ISLN. SWITCH CANNOT FAIL SO AS TO INDICATE AFPT ROOM HIGH TEMP AND INITIATE STEAT SUPPLY ISLN
WBN-1-TS -001-00138 -B 1-TS TEMP Switch STM Flow to AFPT	-001-00188 -5 17323-0	6921 ADo 75K13-085422	A B	5MN 1000	AF L	DETECT AFPT ROOM HIGH TEMP TO INITIATE STEAM SUP ISLN. SWITCH CANNOT FAIL SO AS TO INDICATE AFPT ROOM HIGH TEMP AND INITIATE STEAM SUPPLY ISLN
WBN-J-TS -012-0091A -A O-TS TEMP SW - AUX BLDG STEAM LINE RUP	-012-0091A -1 TURE 12023-7	7244 - 403 34 KK 3-334197	A	1MN _	AB	DETECT AUX BLDG STEAM LINE Rupture and initiate ISLN of Turbine Bldg Steam Flow To Aux Bldg.

PAGE A-2 RI

			C.C.M.	R	ß
PREPARER/DATE	BDM	8/11/86	2/2/189		
CHECKED/DATE	AWL	•8/16/86	HOR		
			1-21-57		

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WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION HATRIX

EQIS_NUMBER UNII_DEVICE_ID_NOAZHIIH_ DESCRIPTION NUMBER	LOCATION ELGV(1) BH/BAD COULSAGI	CAI QPER_IIME (2)	EVENI	SAFETY_EUNCTION
WBN-0-TS -012-0091B -B 0-TS -012-00913 -3 TEMP SW - AUX BLDG STEAM LINE RUPTURE 13023-7	7 2 9 + 606 84 KK 3 - 3341 97	a 14N	A B	DETECT AUX BLDG STEAM LINE Rupture and initiate ISLN of Turbine bldg steam flow To aux bldg.
WBN-J-TS -012-0092A -A 0-TS -012-0092A -A TEMP SW - AUX BLDG STEAM LINE RUPTURE 18023-7	6920 A14 34KK 3-934197	A 1MN	AB }	DETECT AUX BLDG STEAM LINE Rupture and initiate ISLN of Turbine blog steam flow To aux bldg.
WBN-J-TS -012-0092B -B 0-TS -012-0092B -B TEMP SW - AUX BLDG STEAM LINE RUPTURE 18023-7	692* A14 34KK3-834197	a 1nn	AB	DETECT AUX BLDG STEAM LINE Rupture and initiate Isln of Turbine bldg steam flow To aux bldg.
WBN-J-TS -012-0093A -A 0-TS -012-0093A -A TEMP SW - AUX BLDG STEAM LINE RUPTURE 18023-7	713• AQ1 84KK3-834197	A 1MN	AB	DETECT AUX BLDG STEAM LINE Rupture and initiate Isln of Turaine Bldg Steam Flow To aux Bldg.
WBN-3-TS -012-0093B -B 0-TS -012-0093B -B TEMP SW - AUX BLDG STEAM LINE RUPTURE 18023-7	713° A31 84KK3-334197	A 1MN	AB	DETECT AUX BLDG STEAN LINE Rupture and initiate Isl% of Turðine bldg steam flow To aux bldg.
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PAGE A-3 RI	PREPARER/DAT Checked/date	EBDM AWL	8/ 8/	$\frac{11/86}{16/86} \xrightarrow{2-21-57}^{k} \xrightarrow{k}_{k}$





BINDER NO. : WBNEQ-ITS -05 MANUFACTURER : FENHAL PAGE 3 OF 4

WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

		-!				
EQIS_NUMBERUNI DESCRIPTION	LDEVICE ID NOL AIMIH_ HODEL HUMBER	ELEVIII GUZRAD GONIBAGI	<u>CA</u> I (2)	QPER_IIME	EVENI	SAEEIX_EUNCIION
WBN-D-TS -012-0095A -A 0-T Temp SW - Aux Bldg Steam Line (5 -012-0095A -A Rupture 19023-7	692° AC1 94 KK 3-934197	A	1 M N	AB	DETECT AUX BLOG STEAM LINË Rupture and initiatë isln of Turbinë blog steam flow To aux blog.
WBN-J-TS -012-0095B -B 0-T TEHP SW - AUX BLDG STEAH LINE	5 -012-00958 -B Rupture 16023-7	692" AG1 84KK3-334197	A	1 _{NN}	AB	DETECT AUX BLDG STEAM LINE RUPTURE AND INITIATE ISLN OF TURBINE BLDG STEAH FLOW TO AUX BLDG.
WBN-D-TS -012-0096A -A O-T TEMP SW - AUX BLDG STEAN LINE	S -012-0096A -A RUPTURE 18023-7	692• A01 84KK3-334197	A	1 M N	AB .	DETECT AUX BLDG STEAM LINE Rupture and initiate ISLN of Turbine bldg steam flow To aux bldg.
WBN-D-TS -012-00968 -8 0-T TEMP SW - AUX BLDG STEAN LINE	S -J12-0096B -8 RUPTURE 18023-7	692° A01 84KK3-334197	A	1mn	AE	DETECT AUX BLDG STEAM LINE RUPTURE AND INITIATE ISLN OF TURBINE BLDG STEAM FLOW TO AUX BLDG.
WBN-J-TS -012-0098A -A Ŭ-T TEMP SW - AUX BLDG STEAN LINE	S -012-0078A -A Rupture 13023-7	69 2* AÐ 1 34 KK 3-3341 97	A	1 M N	4 B	DETECT AUX BLOG STEAM LINE RUPTURE AND INITIATE ISLN OF TURBINE BLDG STEAM FLOW TO AUX BLDG.
· .	PAGE A-4 RI	PREPARERYDAT: CHECKED/DATE	≡BDN AWI	M <u>8/11</u> L <u>8/16</u>	<u>/86 \</u> <u>/86</u>	R I R R R R R R R R R R R R R R R R R R





BINDER NO. : WENEQ-ITS -08 MANUFACTURER : FENWAL PAGE 4 OF 4

WATTS SAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

· •	LOCATION	-		
EGIS_NUMBERUNII_DEVICE_ID_N2. DESCRIPTION MODEL_NUM	AZMIIH_ ELEV(1) BM/BA EEE CONTRACT	0 <u>CAI</u> 0 _ (2)	PER_TIME EYEUI	SACETY_EUNCTION
WBN-D-TS -012-0098B -8 0-TS -012-0098B -8 TEMP SW - AUX BLDG STEAH LINE RUPTURE 15023-7	69 2• A D 1 84 KK 3-334 1 97	A 1	MN AB	DETECT AUX BLDG STEAM LINE Rupture and initiate Isln of Turbine bldg steam flow To aux bldg.
WBN-D-TS -012-0099A -A 0-TS -012-0099A -A TEMP SW - AUX BLOG STEAM LINE RUPTURE 18023-7	69 24 A14 84 KK 3-8341 97 1	A 1	MN AB	DETECT AUX BLDG STEAM LINE Rupture and initiate ISLN of Turbine bldg steam flow To aux bldg.
WBN-J-TS -012-0099B -B 0-TS -012-0099B -B TEMP SW - AUX BLDG STEAM LINE RUPTURE 18023-7	572" A14 54KK3-834197	A 1	MN AB	DETECT AUX BLDG STEAM LINE RUPTURE AND INITIATE ISLN OF TURBINE BLDG STEAM FLOW TO AUX BLDG.
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PAGE A-5	RI	· · · · · · · · · · · · · · · · · · ·	BDM	8/11/86	R EGAT SILIEVY	R	R	
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		NOIES			
1.	Elevations shown are <u>Act</u> the Reactor Building and outside the Reactor Buil ment are documented in T	<u>tual</u> elevations <u>Floor</u> elevatio ding. Actual o AB F.	for equi ons for e elevation	pment locat quipment lo s for all e	ed in cated quip-
2.	See Page B-2 for source ments.	of Category and	i Operati:	ng Time ass	ign-
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PAGE A-6 R1

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·		<u></u>	TAB B			
	Contents:					
	EQ Checksheets					
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		F	AGE 13-1		EQP05	3.21

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A. <u>DOC</u>	UMENTATION	
Equ	ipment Description	Temperature Switches
Ven	dor/Manufacturer	Fenwal
· Equ	ipment Model No.(s)	17323-0
		18023-7
	÷ .	
OUA	LIFICATION REPORTS	
(1)	Title/Wumber/Dewie	ion the Musican Provin DIME DER 0000051
(1)	ment Qualification	. Temperature Switches/
	<u>17509–1/R0</u>	DATE May 16, 1983
OTH	ER (ANALYSIS. VENDO	R DATA, ETC.)
	(
(2)	Material Aging Cal	culation (MAC 10)
(2)	Material Aging Cal	culation (WAC-10).
(2) (3)	Material Aging Cal System "1" Categor B45 861017 218).	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10,
(2) (3) (4)	Material Aging Cal System "1" Categor B45 861017 218). System "12" Categor B45 851031 226).	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4,
(2) (3) (4) (5)	Material Aging Cal System "1" Categor B45 861017 218). System "12" Categor B45 851031 226). QIR NEB86072, "Loc 0-TS-12-91 A & B"	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4, ation Specific Dose Analysis for (B45 860613 263).
(2) (3) (4) (5) (6)	Material Aging Cal System "1" Categor B45 861017 218). System "12" Categor B45 851031 226). QIR NEB86072, "Loca O-TS-12-91 A & B" WBPE0018604016 R0 S (B43 860519 901).	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4, ation Specific Dose Analysis for (B45 860613 263). System "1" Instrument Accuracy Calculation
 (2) (3) (4) (5) (6) (7) 	Material Aging Cal System "1" Category B45 861017 218). System "12" Category B45 851031 226). QIR NEB86072, "Loca O-TS-12-91 A & B" WBPE0018604016 R0 S (B43 860519 901). O-TS-12-91A Instrum	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4, ation Specific Dose Analysis for (B45 860613 263). System "1" Instrument Accuracy Calculation ment Accuracy Calculation (B43 860117 903).
 (2) (3) (4) (5) (6) (7) (8) 	Material Aging Cal System "1" Category B45 861017 218). System "12" Category B45 851031 226). QIR NEB86072, "Loca O-TS-12-91 A & B" WBPE0018604016 R0 S (B43 860519 901). O-TS-12-91A Instrum System "1" Set-point	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4, ation Specific Dose Analysis for (B45 860613 263). System "1" Instrument Accuracy Calculation ment Accuracy Calculation (B43 860117 903). nt Evaluation (B44 860401 008).
 (2) (3) (4) (5) (6) (7) (8) (9) 	Material Aging Cal System "1" Category B45 861017 218). System "12" Category B45 851031 226). QIR NEB86072, "Loca 0-TS-12-91 A & B" WBPE0018604016 R0 S (B43 860519 901). 0-TS-12-91A Instrum System "1" Set-point WBN0SG4-050 R1 System (B45 860530 219).	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4, ation Specific Dose Analysis for (B45 860613 263). System "1" Instrument Accuracy Calculation ment Accuracy Calculation (B43 860117 903). ht Evaluation (B44 860401 008). tem "12" Set-point Evaluation
 (2) (3) (4) (5) (6) (7) (8) (9) (10) 	Material Aging Cal System "1" Category B45 861017 218). System "12" Category B45 851031 226). QIR NEB86072, "Loca O-TS-12-91 A & B" WBPE0018604016 RO S (B43 860519 901). O-TS-12-91A Instrum System "1" Set-point WBNOSG4-050 R1 System (B45 860530 219). Environmental Data and -07-0 per DCN H	culation (WAC-10). y and Operating Times (WBNOSG4-004 R10, ry and Operating Times (WBNOSG4-006 R4, ation Specific Dose Analysis for (B45 860613 263). System "1" Instrument Accuracy Calculation ment Accuracy Calculation (B43 860117 903). nt Evaluation (B44 860401 008). tem "12" Set-point Evaluation Drawing 47E235-39, R4 and DCA-P-02351-06-0 P-02351-A (B26 881210 801)

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BINDER T	TLE FENWAL COMPUTED BDM DATE 8-18-86 EEM EE
	CHECKED <u>AWL</u> DATE <u>8-25-86 WCG</u> <u>A</u> 10/18/89 ²⁷
A. DOCUM	ENTATION
OTHER	(ANALYSIS, VENDOR DATA, ETC.) (Continued)
(12)	Environmental Data Drawing 47E235-52, R1.
- (13)	Environmental Data Drawing 47E235-62, Rl.
(14)	Environmental Data Drawing 47E235-68, R1.
(15)	Environmental Data Drawing 47E235-69, R2 and DCA-P-02351-23-0 per DCN P-02351-A (B26 881210 801).
(16)	Environmental Data Drawing 47E235-54, R2.
(17)	Environmental Data Drawing 47E235-63, R2 and DCA-P-02351-19-0 per DCN P-02351-A (B26 881210 801).
(18)	Environmental Data Drawing 47E235-64, R2 and DCA-P-02351-20-0 per DCN P-02351-A (B26 881210 801).
(19)	QIR NEB86203, "Re-Analysis of Location Specific Calculations" (B45 861007 258).
(20)	EQIR WBN EQC 89007 (Attachment 2) "Calibration Cards For System 12 Temperature Switches" (T48 890928 918).
(21)	EQIR WBN EQC 89013 "Explanation of 1D number variations for system 12 temperature switches." (T48 891122 984)
Note	: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the binder. This listing includes only those documents which are
	essential to qualification and accordingly should not be

PAGE B-3 R3

	IDER TITT	LE <u>FENWAL</u>	(COMPUTED	BDM	DATE	<u>9-15-8</u> 6	<u><u><u> </u></u></u>	<u> </u>
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B	CONCLUS	SION OF REVI	<u>EW</u> (Check	only one	block)				
	X	_ Equipment	Qualified	(Pending	Accepta	ble Re	solutio	n	
				of Open	Items)				
•		_ Equipment Life or	Satisfies Justifica	All Requition of R	irements eplaceme	Excep nt Sch	t Quali edule	lfied	
		_ Equipment	Qualifica	tion Not	Establis	hed by	Docume	entation	ı
		_ Equipment	Not Quali	fied Base	d on Tes	t Fail	ures		
	OPEN I	TEMS AND QUA	LIFICATION	DEFICIEN	CIES:				
	(1) D	eleted.			·				
	(2) D	eleted					•		· 1
	S	ystem 12 dem	onstrated	accuracy	calculat	ion.			
		. ·					·		
		· · ·							
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C.	QUALIFICATION CRITERIA
	Criteria Used to Demonstrate Qualification is in Accordance with Following (Indicate Which Criteria is Applicable):
	X Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE323-1974)
-	Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of 1E Bulletin No. 79-0 (IEEE323-1971) (DOR Guidelines Applicable to only BFN)
	JUSTIFICATION/COMMENTS M/N 17323-0 devices were original install
	tion and subject to NUREG 0588. Cat. II. M/N 18023-7 was a later
	procurement and subject to NUREG 0588, Cat. I. All Fenwal M/Ns
	were qualified by test in accordance with 10CFR50.49 and
	NUREG 0588. Cat. I.
•	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET
	Reference Report Section XIII (1.2)
	- IEEE 323-1974 and 344-1975
	- NUREG 0588, Category I
	- Reg Guides 1.89 and 1.100
	- Reg Guides 1.89 and 1.100 - 10CFR50 Appendix B

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D.	<u>QUALIFICATION METHODOLOGY</u> (Check only one block) -							
	X Test of Identical Item Under Identical Conditions or Uno Similar Conditions with Supporting Analysis							
	Test of Similar Items with Supporting Analysis							
	Analysis in Combination with Partial Type Test Data tha Supports the Analytical Assumptions and Conclusions							
	Experience with Identical or Similar Equipment Under Simila Conditions with Supporting Analysis							
	JUSTIFICATION/COMMENTS The Wyle EQ Test Report No. 17509-1 (TAB							
	was conducted specifically for TVA BFN, and SQN; however, due to							
	<u>similar environment (temperature, pressure, radiation), similar</u>							
	· ·							
	application and test of identical model numbers-the test report							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types							
	application and test of identical model numbersthe test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed							
	application and test of identical model numbersthe test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbersthe test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbersthe test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers-the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
- ·	application and test of identical model numbers—the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							
	application and test of identical model numbers—the test report also applicable to WBN. Testing was performed on identical types of temperature switches (Model No. 18023-7 and 17323-0) installed at WBN.							

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E.	EQUI	PMENT DESCRIPTION			
	Is t	he equipment identifi	ed in the qualifi	ication report id	lentical to the Yes
	pran	c equipment which req	ulles qualificati		
			<u>Plant Device</u>	Qualification Document	Reference
	(1)	Reviewent Mana	Tomp Switch	Sama	See 1 below
	(1)	Equipment Type	<u>Temp Switcen</u>		See 1
	(2)	Manufacturer	Fenwal	Same	<u>below</u> See 1
	(3)	Model Number(s)	17323-0	Same	below See 1
			18023-7	Same	below
	(4)	Serial Number(s)	<u>NA</u>	<u>NA</u>	
	·				<u> </u>
	(5)	Identify Component-	NA		
	,	Unique checksheet attached:			
	JUS:	TIFICATION/COMMENTS	<u></u>		
	1.	Tab D, PAGE XII, and	1 Tab F (Field Ve	rification).	
			<u></u>		
					<u></u>
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INSTALLATION INTE	RFACES		<u></u>
List all interface and/or evaluation requirement for ou enter requirement	es pertinent to EQ identifie and reference the source. ir application (Yes/No)? (No in QMDS, if No, provide jus	ed in the test n Is the interfac ote below.) If stification.	eport e a yes,
Interface	Identify Interface	Plant Requirement (Yes/No)	Reference <u>Test Report</u>
Mounting Bolts	None	NA	<u>NA</u>
External Process Connections	None	NA	NA
Electrical Connections	**Connections should be per qualified plant procedures and covered with Raychem tubing.	<u> </u>	Section I, p I-2, I-3,(2 2.2.4) Sect. (Fig 26)
	Jul		Section I, p I-2, I-3, (2 2.2.4), Sect
Conduit Seals	**Raychem heat-shrink	×	Sect. I, pg I-3, (2.2.2
Connector Seals	<u>tubing on terminations</u>	*	<u>Sect. XIII (F</u>
Orientation	None	NA	<u>NA</u>
Physical Configuration	None	NA	<u>NA</u>
Other	None	NA	NA
JUSTIFICATION/COM *Requirements e **M/N 18023-7 do	MENTS ntered in QMDS (See Tab G). es not require conduit seal: or rigid) is required from	s; however, cont the switch to th	tinuous ne junction_box

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EOP058.21

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G. <u>TES</u>	r sequ	ENCE		<u> </u>	· · · · · · · · · · · · · · · · · · ·
(1)	Test acci (ves	Sequence: Was the test s dent environment in accord /no/NA)? (note below)	equence establ lance with IEE	lished t E-323 (7	o simulate the 4), paragraph 6.3
	• • • • •		Yes/N	o/NA_	Reference
	(a)	Equipment inspected for d	amage <u>Ye</u>	<u>s</u>	Tab D Sect. I, pg <u>I-1, (2.1)</u>
					Tab D Sect. I, pgs I-3 thru I- (2 3 thru 2 4
	(b)	Baseline performance	Ye	<u>s</u>	3.0 results
	(c)	Equipment aged:			
		Thermal	Ye	<u>s</u>	Tab D Sect. IV, pgs IV-1 thru I
		Radiation	<u>*NA</u>	مر ، بری تکر	Tab D <u>Sect. II (1.1)</u>
	·	Wear	Ye:	<u>s</u>	Sect. VI, pgs <u>VI-1 thru VI-4</u>
	(d)	Vibration/seismic testing conducted	Ye:	<u>s</u>	Tab D Sect. VIII, pgs <u>VIII-l thru VII</u>
•	(e)	Design basis event (DBE)			
		exposure	Ye	<u>9</u>	Tab D Section X pgs X-1 thru X-1
	(f)	Post-DBE exposure	Ye	<u>s</u>	Tab D Section X pgs X2 thru X-4
	(g)	Final inspection and disassembly	Ye:	<u>9</u>	Tab D <u>Section XII</u>
(2)	Was desc	the same piece of equipmen ribed in item (1) above (y	t used through es/no/NA)? <u>Ye</u>	hout the <u>s</u>	e test sequence
(3)	Have been	the test equipment, test appropriately documented	equipment accu (yes/no/NA)?]	uracies <u>Yes</u> (Ref	and calibration dates and calibration dates and the second s
JUST	TIFICA	TION/COMMENTS <u>Refer also</u>	to Tab D page:	si, ii.	
*See	page	B12, Section H5-C.			

BINDE	R NO.	PLANT UNIT(S) UNIT(S)	S	HEET OF
BINDE	RTITL	E COMPUTED	DATE <u>515-81</u>	<u>k</u>
<u></u>	. <u></u>	CHECKED AND	DATE 5/15/86	<u> </u>
Н.	AGIN	<u>G</u>	<u> </u>	
4	(1)	Was aging considered in the qualification pr (Yes/no/NA)? <u>Yes</u> (Reference <u>Tab D Section</u>	ogram <u>IV, VI</u>).	
		JUSTIFICATION/COMMENTS		
	(2)	Were the following effects considered in the	e aging progr	: am :
		Aging Effect	<u>Yes/No/NA</u>	<u>Reference</u> Tab D
		Thermal aging	Yes	Section IV
		Radiation exposure	<u>* NA</u>	<u>II (1.1)</u>
		Vibration (non-seismic) aging	<u>** No</u>	NA
		Operational (electrical/mechanical/process) stress aging	Yes	Section_IV
		JUSTIFICATION/COMMENTS <u>* See page B12, Sect</u>	ion H5-C.	
		** See page B9.		
	(3)	Were all known synergistic effects which are significant effect on equipment performance program (yes/no/NA)? <u>No</u> (Reference <u>Section</u>	e believed to considered i <u>XIII (3.4)</u>	have a in the aging).
		JUSTIFICATION/COMMENTS Long-term effects fr	com temperatu	re, cycling,
		seismic and humidity were considered in the	testing: how	vever,
		radiation exposure was not performed in the	test program	n due to
		low TID (see page Bl2, Section H-5C).		
	(4)	Thermal Aging:		
		(a) Was thermal aging considered in the qua (yes/no/NA)? <u>Yes</u> (Reference <u>Tab l</u>	alification p D Section IV	orogram).
		JUSTIFICATION/COMMENTS		<u></u>

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3	**Non-se:	<u>ismic_vibr</u>	ation is	not an EQ	considera	tion for	these devic	:es
	<u>These</u>	<u>levices ar</u>	<u>e rigidly</u>	wall mou	nted. Also	<u>, the sei</u>	<u>smic_testir</u>	<u>lg</u>
			tural int	egrity of	these dev	ices.		
•	<u> </u>							
								<u></u>
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EQP05	8.21			PAGE B	-11			

		BINDE	R NO	WBNE	Q-ITS-001	PLANT	WBN	UNIT(S)	1	_ SHEET	B10 OF	40
		BINDE		FE	NWAL		COMPL	TED <u>BDM</u>	_ DATE	- <u>15-86</u>	R	
								ED ANR	. DATE <u>5/</u> /	15/86		
-		Н.	AGIN	2								
		·		(Ъ)	Were the identific (Reference JUSTIFIC	material ed in the ce: <u>Tab D</u> ATION/COM	s suscept qualific Section MENTS	ible to them ation progra XIII, Table	mal aging m (yes/no <u>I</u>).	degradat /NA)? <u>Yes</u>	ion L	•
				(c)	Was the program	basis for (yes/no/N ATION/COM	thermal A)? <u>Yes</u> MENTS	aging identi (Reference <u>T</u>	fied in t <u>ab D Sect</u>	he qualif ion XIII	ication (3.4))	•
				(d)	Was the time and (yes/no/)	aging acc t <i>e</i> mperat NA)? <u>Yes</u>	eleration ure ident (Referenc	rate justif ified in the e <u>Tab D Sect</u>	ied and t qualific . XIII(3.	he parame ation pro 4),Sect.	eters of ogram IV).	
					<u>Paramet</u> Temperate Time JUSTIFIC	<u>er</u> ure Ation/Com	<u>Plant Max</u> (.99) (.01)110° <u>4</u> MENTS <u>*S</u>	imum Normal 104°F + F=104.06°F) years ee_Sheet_Bll	<u>Test</u>	<u>Equis</u>		
				(e)	Was the (yes/no/ JUSTIFIC	Arrhenius NA)? <u>Yes</u> ATION/COM	methodol (Referen MENTS	ogy used for ce <u>Tab D Sec</u>	accelera t. XIII(3	ted aging	<u>. IV</u>).	·
				(f)	If activ aging pa of the t Section	ation ene rameters, echnical XIII, Tab	rgies wer are they data (yes <u>le I</u>).	e used for d properly re /no/NA)? <u>Yes</u>	eterminin ferenced (Referen	g acceler to the so ce <u>Tab D</u>	ated Durce	
					JUSTIFIC.	ATION/COM	MENTS					
		EQP	058.21				PAGE_C	-12				

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DINDE	FENWAL	PLAN I		DATE 51	「日日日」
DINUC	n III LE	<u> </u>		L DATE S/15	 8/</th
				• DATE	/···
<u>m/n</u>	17323-0				
ň	<u>Case I</u>				
	Parameter	* <u>Plan</u>	<u>t Maximum Normal</u>	Test	<u>Equivalen</u>
	Temperature (°F) Time	<u> 104</u> 40	vears	<u>172.4</u> 213.2 hrs	<u>104.06</u> 21.30 yrs
	<u>Case II</u>				
	Parameter	* Plan	<u>t Maximum Normal</u>	Test	<u>Equivalen</u>
	Temperature (°F) Time	<u> 104</u> 40	vears	172.4 406 hrs	<u>104.06</u> 40.56 yrs
	<u>Case I - Applicat</u>	tions where	<u>e switch is requi</u>	red to actuate	on both
	inoroogi	ng and dec	reasing temperatu	ces.	
			الكسيسية بريواك بمبتعين معاترات التوادية تروان		
·	Increasin				
	Case II - Applicat	tions wher	e switch is requir	red to actuate	on
	<u>Case II - Applicat</u> increas	tions wher	e switch is requir ature only. (Refer	red to actuate	on
	<u>Case II - Applicat</u> <u>increas</u>	tions wher	e switch is requip ature only. (Refe	red to actuate rence Tab C, T	on hermal Aging
	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> *Plant max normal	tions wher ing temper s).	e switch is requir ature only. (Refer 1% of 40 year plan	red to actuate rence Tab C, T nt life at max	on hermal Aging abnormal
	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> temperature.	tions wher ing temper s). includes	e switch is requir ature only. (Refer 1% of 40 year play	red to actuate rence Tab C, Ti nt life at max	on hermal Aging abnormal
	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u>	tions wher ing temper s). includes	e switch is requip ature only. (Refer 1% of 40 year plan	red to actuate rence Tab C, T nt life at max	on hermal Aging abnormal
<u>M/1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u>	tions wher ing temper s). includes	e switch is requir ature only. (Refer 1% of 40 year plan	red to actuate rence Tab C, T nt life at max	on hermal Aging abnormal
<u>M/ N</u>	<u>Case II - Applicat</u> increas: <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u>	tions wher ing temper s). includes * <u>Plan</u>	e switch is requin ature only. (Refer 1% of 40 year plan t Maximum Normal	red to actuate rence Tab C, T nt life at max <u>Test</u>	on hermal Aging abnormal <u>Equivalen</u>
<u>M/1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u> Temperature (°F)	tions wher ing temper s). includes * <u>Plan</u> 10	e switch is requip ature only. (Refer 1% of 40 year plan t Maximum Normal 4.06	red to actuate rence Tab C, T nt life at max <u>Test</u> <u>172.4</u>	on hermal Aging abnormal <u>Equivalen</u> <u>104.06</u>
<u>M/1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u> Temperature (°F) Time	tions wher ing temper s). includes * <u>Plan</u> <u>10</u> 40	e switch is requir ature only. (Refer 1% of 40 year plan t Maximum Normal 4.06 years	red to actuate rence Tab C, T nt life at max <u>Test</u> <u>172.4</u> <u>102 hrs</u>	on hermal Aging abnormal Equivalen 104.06 10.19 yrs
<u>M/1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u> Temperature (°F) Time <u>Reference-Tab C, 1</u>	tions wher ing temper s). includes * <u>Plan</u> <u>10</u> <u>40</u> Thermal Ag	e switch is requir ature only. (Refer 1% of 40 year plar t Maximum Normal 4.06 years ing Analysis	red to actuate rence Tab C, T nt life at max <u>Test</u> <u>172.4</u> <u>102 hrs</u>	on hermal Aging abnormal Equivalen <u>104.06</u> <u>10.19 yrs</u>
<u>M/ 1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u> Temperature (°F) Time <u>Reference-Tab C, 1</u>	tions wher ing temper s). includes * Plan <u>10</u> 40 Thermal Ag	e switch is requir ature only. (Refer 1% of 40 year plan t Maximum Normal 4.06 years ing Analysis	red to actuate rence Tab C, T nt life at max <u>Test</u> <u>172.4</u> <u>102 hrs</u>	on hermal Aging abnormal <u>Equivalen</u> <u>104.06</u> <u>10.19 vrs</u>
<u>M/1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u> Temperature (°F) Time <u>Reference-Tab C, 1</u> <u>*Plant max normal</u>	tions wher ing temper s). includes * Plan 100 40 Thermal Ag includes	e switch is requir ature only. (Refer 1% of 40 year plan t Maximum Normal 4.06 years ing Analysis 1% of 40 year plan	red to actuate rence Tab C, T nt life at max <u>Test</u> <u>172.4</u> <u>102 hrs</u> nt life at max	on hermal Aging abnormal <u>Equivalen</u> <u>104.06</u> <u>10.19 yrs</u> abnormal
<u>M/1</u>	<u>Case II - Applicat</u> <u>increas</u> <u>Analysis</u> <u>*Plant max normal</u> <u>temperature.</u> <u>N 18023-7</u> <u>Parameter</u> Temperature (°F) Time <u>Reference-Tab C.</u> <u>*Plant max normal</u> <u>temperature.</u>	tions wher ing temper s). includes * Plan 100 40 Thermal Ag includes	e switch is requir ature only. (Refer 1% of 40 year play t Maximum Normal 4.06 years ing Analysis 1% of 40 year play	red to actuate rence Tab C, T nt life at max <u>Test</u> <u>172.4</u> <u>102 hrs</u> nt life at max	on hermal Aging abnormal Equivalen 104.06 10.19 yrs abnormal

			CHECKED RANK DATE 6/25/56
H.	AGING	(Co	ontinued)
a.		(g)	If a regression line was used for determining accelerated aging parameters, are test points or failure modes identified on the line (yes/no/NA)? <u>NA</u> (Reference).
		(h)	Was the equipment operated during the thermal aging (yes/no/NA)? <u>No</u> (Reference <u>Tab D Section IV</u>).
			JUSTIFICATION/COMMENTS Operation during thermal aging not
			a factor for this type of equipment.
	(5) Radiation Aging Exposure:		ation Aging Exposure:
		(a)	Was radiation aging exposure considered in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>Tab D Section II(1.1)</u>).
			JUSTIFICATION/COMMENTS These devices were exempted from
			radiation exposure in testing. See comment below.
	•	(b)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>Tab D Section XIII, Table I</u>).
			JUSTIFICATION/COMMENTS
		(c)	Was the basis for excluding radiation aging exposure identified in the qualification program (yes/no/NA)? <u>No</u> (Reference <u>Tab D</u> <u>Section II(1.1), Section XIII, Table I</u>).
	. •		JUSTIFICATION/COMMENTS Worst case radiation exposure for both M/N 17323-0 and 18023-7 is less than 5 x 10 [°] , rad (TID). For this equipment a dose of approximately 5 x 10 [°] rad, gamma is considered negligible based on the equipment's design,
			materials used, and other test data. In the qualification test, identical devices with respect to materials and funct- ional design, but having different model numbers were successfully qualified for doses in excess of 1 x 10' rad, gamma (Tab D sheats iii in and Section II(1 1))
		•	Kamma (tap p Sheets III, IV and Section II(1.1/).

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BINDER TITLE	FENWAL COMPUTED BDM	DATE <u>5-15-86</u> <u>227</u>
· · · ·	CHECKED AWL	DATE <u>5-15-86</u> 2-21-89
H. <u>AGING</u> (Co	ntinued)	
(d)	Is the radiation test exposure do acceptable (Yes/No/NA)? <u>NA</u> (se and dose rate Reference: <u>NA</u>
	Plant normal ambient radiation dose (rd)	NA
	Test exposure dose (rd)	NA
	Test exposure dose rate (rd/hr)	NA
	Test exposure source type (e.g., Co-60 gamma)	NA
	JUSTIFICATION/COMMENTS <u>*See page</u>	B12 Section H(5)
(6) Vibr	ation (non-seismic) Aging:	
(a)	Were the effects of non-seismic v normal and abnormal operation add qualification program ¹ <u>No</u>	ibration induced duri ressed in the (Reference: <u>NA</u>
-	JUSTIFICATION/COMMENTS <u>**See com</u> page B9. Non-seismic Aging.	ment on Section H(2)
(b)	Was the basis for vibration aging in the qualification program (Yes (Reference: <u>NA</u>	identified and justi /No/NA)? <u>NA</u>
	JUSTIFICATION/COMMENTS	
(7) Opera	tional Stress Aging:	
	Were the effects of electrical, me	chanical, and process g normal and abnormal
(a)	operation adressed in the qualific (Yes/No/NA)? <u>Yes</u> (Reference: <u>T</u> Section XIII (3.4.4)	ation program AB D Section VI,
(a)	operation addressed in the qualific (Yes/No/NA)? <u>Yes</u> (Reference: <u>T</u> Section XIII (3.4.4) JUSTIFICATION/COMMENTS	ation program AB D Section VI,

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PAGE B-15 R1
	TITLE FENWAL COMPUTED BDM DATE 5-15-86	EEM
	<i>ا</i> د مراجع	131/89 110-
	CHECKEDAWL DATE <u>5-15-86</u> :	21-89
	······································	
H. <u>AGIN</u>	NG (Continued)	-
	(b) Was the basis for strasses induced during operati	onel
	aging identified and justified in the qualificati	on
	program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D</u> ,	
	Section VI	
	JUSTIFICATION/COMMENTS These devices are cycled	only
	during routine testing; not during normal operati	on
(8)	Was the qualified life of the equipment and its basis	dofino
(0)	in the qualification program (Yes/No/NA)? Yes	derine
	(Reference: TAB D, page iii, Section IV	
	Qualified life (Document in QMDS) <u>See sheets B15</u>	
	JUSTIFICATION/COMMENTS	
(9)	defined in the qualification program (Yes/No/NA)? Yes	mponen
	(Reference: TAB D, page iii, Section IV	
		<u></u>
		<u></u>
		<u> </u>
	JUSTIFICATION/COMMENTS	

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BINDER NO. <u>WBNEQ-ITS-001</u> PLANT_	WBN UNIT(S)	1	SHEET_		0F
BINDER TITLE FENWAL	COMPUTED IRI E E M	DATE	R <i>אַרָּוֹבוְבַ</i>	R	
·.	CHECKED RIHER	DATE	2-21-89		
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	DER TIT	LE FENWAL		BAN DA HALL DA	ate <u>5-20-86</u> ate <u>5/20/86</u>	кк .
I.	MATE	RIALS ANALYSIS				<u> </u>
	Iden	tification of Materials Sus	sceptible to) Significan	nt Thermal ar	nd/or
4	Radi Mate	ation Degradation and Aging rials Analysis) (M.N.'s 1	g (Use Secti 7323-0, 180	on C of Bin 23-7)	nder for Deta	ailed
	1	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Referen
	(a)	FAGT/Wire Insulation	1.7 ± 10^4	*	1.69	*
	(Ъ)	Feflon/Insulation	1.7 ± 10^4	*	1.69	*
	(c)	Glass/Insulation	5×10^8	*	NAS	*
	(d)					
	(a)					
	JUS (3.4	TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	, Section X	III, Table	I; and Secti	on XIII,
•	JUS"	TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	, Section X	III, Table	I; and Secti	on XIII,
	<u>(3.</u>	TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	, Section X	III, Table	I; and Secti	on XIII,
	JUS"	TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	. Section X	III, Table	I; and Secti	on XIII,
		TIFICATION/COMMENTS <u>*Tab D</u> 4.2).), Section X	III, Table	I; and Secti	on XIII,
		TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	9. Section X	III, Table	I; and Secti	on XIII,
		TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	9, Section X	III, Table	I; and Secti	on XIII,
		TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	, Section X	III, Table	I; and Secti	on XIII,
		TIFICATION/COMMENTS <u>*Tab D</u> 4.2).	9, Section X	III, Table	I; and Secti	on XIII,

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BINDE	R TITL	E FENWAL COMPUTED BOM DATE	<u>S-15166</u> <u>R</u> <u>R</u>
		CHECKED ANL DATES	5-15-84
J.	EQUI SPEC	PMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE IFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITION	<u>THE PERFORMANCE</u>
4	(1)	Acceptance Criteria: Does the report/analysis ident values of performance characteristics which would co not met (yes/no/NA)? Yes (Reference Tab D Section X	ify the limiting sonstitute failure ((1.1)).
		Identify Acceptance Criteria: Specimens shall switch	on increasing
		temperature and remain switched as long as accident	temperature re-'
		mains above setpoint (i.e., operability and switchin	<u>ig`temperature'</u>
·		only).	
		performance characteristics for the equipment which before, after, and periodically during the test to j performance (yes/no/NA)? <u>Yes</u> (Reference <u>Tab D Secti</u> Identify baseline and functional testing: Specimens	should be verifie udge equipment on X ⁻ (2.4)).
	: .	loaded as described in references and monitored before	pre, during, and
		after testing to judge equipment performance.	
		JUSTIFICATION/COMMENTS	
	(3)	Does the qualification report/analysis describe load combinations) applied during DBE test (yes/no/NA)? Y (Reference Tab D Section X (2.4)).	ls (or load <u>'es</u>
		JUSTIFICATION/COMMENTS See (2) above.	
			· · · ·

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				CHECKED <u>AWL</u> DATE	2 <u>5-15-86 HBR</u> 2-21-59
.T.	FOUT	PMENT	ELECTRICAL	CHARACTERISTICS NECESSARY TO	ENSURE THE -
	PERF (Con	ORMAN tinue	CE SPECIFICA	TIONS CAN BE SATISFIED UNDER	ACCIDENT CONDIT
	(4)	Do t oper	he applied l ating condit	oads during baseline testing ions (Yes/No/NA)? Yes_ (Re	; reflect normal eference: <u>TAB_D</u> ,
		Sect	ion I-2.3.4		
		JUST	IFICATION/CO	MMENTS The applied load use	ed by Wyle for
		<u>base</u>	line testing	includes a 10% margin for y	roltage
					<u></u>
	(5)	Iden equi	tify electri pment perfor	cal characteristics necessar mance specifications can be	to ensure the satisfied.
		(a)	Parameter	Plant Normal Conditions	Reference
			Voltage	120 VAC	45 W760-1-2 45 N 600-12
			Load	N/A	
			_	60 Hz	45W760-1-2 45N600-12
•		•	Frequency		4511000 -12
•			Frequency -	$17323-0 \pm 11.6$ °F	Instrument Accuracy Calc
•			Frequency Accuracy	17323-0 ± 11.6°F 18023-7 ± 10.7°F	Instrument Accuracy Calc TAB C
			Frequency Accuracy Other(s)	17323-0 ± 11.6°F 18023-7 ± 10.7°F	Instrument Accuracy Calc TAB C
•			Frequency Accuracy Other(s)	17323-0 ± 11.6°F 18023-7 ± 10.7°F	Instrument Accuracy Calc TAB C
			Frequency Accuracy Other(s) JUSTIFICATI	17323-0 ± 11.6°F 18023-7 ± 10.7°F ON/COMMENTS	Instrument Accuracy Calc TAB C
			Frequency Accuracy Other(s) JUSTIFICATI	17323-0 ± 11.6°F 18023-7 ± 10.7°F ON/COMMENTS	Instrument Accuracy Calc TAB C
			Frequency Accuracy Other(s) JUSTIFICATI	17323-0 ± 11.6°F 18023-7 ± 10.7°F ON/COMMENTS	Instrument Accuracy Calc TAB C
			Frequency Accuracy Other(s) JUSTIFICATI	17323-0 ± 11.6°F 18023-7 ± 10.7°F ON/COMMENTS	Instrument Accuracy Calc TAB C

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INDER T	ITLE FENWAL	COMPUTED BDM DATE 9	<u>-19-86 EEM 60</u> 2/21/89/
		CHECKED <u>AWL</u> DATE 9	الية HDR_19-86_HDR_19-86_2/21/89/ 2/21/89/
J. <u>EQU</u> <u>PER</u> (Co	IPMENT ELECTRIC FORMANCE SPECI ntinued)	CAL CHARACTERISTICS NECESSARY TO E FICATIONS CAN BE SATISFIED UNDER A	INSURE THE ACCIDENT CONDITI
(b)	Parameter	Specific Accident Conditions	<u>Reference</u>
	Voltage	120 ±2.4 VAC	TAB E, 120 VA <u>Vital Instr P</u>
	Load	N/A	
-	Frequency	60 ± 0.6 Hz	TAB E, 120 VA <u>Vital Instr P</u>
	*Accuracy	MN.17323-0 ±11.5°F MN.18023-7 ±11°F	Instrument Accuracy Calc <u>(TAB C)</u>
· ·	Other(s)	N/A	
			·
هـ	JUSTIFICATION quency are an vary from the the 120 VAC	N/COMMENTS <u>Variations in voltage</u> , ccounted for in the design process e continuous operating characteris Vital Instrument Power Design Crit	load and fre- and will not tics outlined i eria (TAB C).
 (c)	JUSTIFICATION quency are an vary from the the 120 VAC	N/COMMENTS <u>Variations in voltage</u> , ccounted for in the design process e continuous operating characteris Vital Instrument Power Design Crit 	load and fre- and will not tics outlined i eria (TAB C).
_a (c)	JUSTIFICATION quency are an vary from the the 120 VAC V Parameter Voltage	N/COMMENTS <u>Variations in voltage</u> , ccounted for in the design process e continuous operating characteris Vital Instrument Power Design Crit 	load and fre- and will not tics outlined i eria (TAB C). Reference TAB D Sect. X (2.4) TAB D
ء۔ (c)	JUSTIFICATION quency are an vary from the the 120 VAC V Parameter Voltage Load	N/COMMENTS <u>Variations in voltage</u> , ccounted for in the design process <u>e continuous operating characteris</u> <u>Vital Instrument Power Design Crit</u> <u>Demonstrated Conditions</u> <u>132 VAC</u> <u>1.61 Amps</u>	load and fre- and will not tics outlined i eria (TAB C). Reference TAB D Sect. X (2.4) TAB D Sect. X (2.4)
 (c)	JUSTIFICATION quency are an vary from the the 120 VAC V Parameter Voltage Load Frequency	N/COMMENTS <u>Variations in voltage</u> , ccounted for in the design process e continuous operating characteris Vital Instrument Power Design Crit <u>Demonstrated Conditions</u> <u>132 VAC</u> <u>1.61 Amps</u> <u>N/A</u>	load and fre- and will not tics outlined i eria (TAB C). Reference TAB D Sect. X (2.4) TAB D Sect. X (2.4) Instrument
 (c)	JUSTIFICATION quency are an vary from the the 120 VAC V Parameter Voltage Load Frequency *Accuracy	N/COMMENTS <u>Variations in voltage</u> . <u>ccounted for in the design process</u> <u>e continuous operating characteris</u> <u>Vital Instrument Power Design Crit</u> <u>Demonstrated Conditions</u> <u>132 VAC</u> <u>1.61 Amps</u> <u>N/A</u> MN.17323-0 ±11.6°F <u>MN.17323-0 ±11.6°F</u>	load and fre- and will not tics outlined i eria (TAB C). Reference TAB D Sect. X (2.4) TAB D Sect. X (2.4) Instrument Accuracy Calc (TAB C)
 (c)	JUSTIFICATION quency are an vary from the the 120 VAC V Parameter Voltage Load Frequency *Accuracy Other(s)	N/COMMENTS <u>Variations in voltage</u> . <u>ccounted for in the design process</u> <u>e continuous operating characteris</u> <u>Vital Instrument Power Design Crit</u> <u>Demonstrated Conditions</u> <u>132 VAC</u> <u>1.61 Amps</u> <u>N/A</u> MN.17323-0 ±11.6°F <u>MN.18023-7 ±10.72°F</u>	load and fre- and will not tics outlined i eria (TAB C). Reference TAB D Sect. X (2.4) TAB D Sect. X (2.4) Instrument Accuracy Calc (TAB C)
 (c)	JUSTIFICATION quency are an vary from the the 120 VAC V Parameter Voltage Load Frequency *Accuracy Other(s) JUSTIFICATION	N/COMMENTS <u>Variations in voltage</u> , ccounted for in the design process e continuous operating characteris Vital Instrument Power Design Crit Demonstrated Conditions 132 VAC 1.61 Amps N/A MN.17323-0 ±11.6°F MN.18023-7 ±10.72°F	load and fre- and will not tics outlined i eria (TAB C). Reference TAB D Sect. X (2.4) TAB D Sect. X (2.4) Instrument Accuracy Calc (TAB C)

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BIND	ER TI	TLE <u> </u>	FENWAL	COMPUTED_	BDM	DATE	5-20-86	<u>_EEM</u> 2/21/8
				CHECKED	AWL	DATE	<u>5-20-86</u>	<u>HDR</u> 2/21/8
к.	REQU	IRED (OPERATING ENVIRON	<u>MENT</u> (Mode	l No.	17323-0)		
	Refe	rence	Environmental Dr	awing No.	47E235 and DC	<u>-68, -69</u> A-P-0235	<u>(692' R</u> 1-23-0	<u>m A06</u>
	(1)	Norma	al Max	(2)	Abno	rmal Max	:	
		(a)	Temperature (°F)	104	(a)	Tempera	ture (°F) <u>110</u>
		(b)	Pressure (psig)	<u>ATM(-)</u>	(Ъ) [.]	Pressur	e (psig)	ATM
		(c)	Humidity (%)	80	(c)	Humidit	у (%)	90
		(d)	Radiation (rd)	3 1.8x10 gamma	(d)	Radiati	on (rd)	NA
	(3)	Proc	ess Interfaces:	None		•		
			<u> </u>			<u>,</u>		
	(4)							
	(4)	State cond:	e anticipated occ itions: <u>Abnormal</u>	urrence fr max condi	equenc	y and du could ex	ration o	f abn o eig
·	(4)	State cond:	e anticipated occ itions: <u>Abnormal</u> s per excursion a	urrence fr <u>max condi</u> nd will oc	equenc tions cur le	y and du could ex ss than	ration of ist up to 1% of the	f abn o eig e pla
	(4)	State cond: hour: life	e anticipated occ itions: <u>Abnormal</u> s per excursion a	urrence fr <u>max condi</u> nd will oc	equenc tions cur le	y and du could ex ss than	ration o ist up to 1% of the	f abn o eig e pla
	(4)	State cond: <u>hours</u> <u>life</u> Accie para	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p	urrence fr <u>max condi</u> nd will oc for any com eak, durat	equenc tions cur le mbinat ion, a	y and du <u>could ex</u> ss than ion of s nd profi	ration of ist up to 1% of the pecified le):	f abn o eig e pla acci
	(4)	State cond: <u>hours</u> <u>life</u> Accid paran (a)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F)	urrence fr <u>max condi</u> nd will oc for any com eak, durat 212/110	equenc tions cur le mbinat ion, a	y and du <u>could ex</u> <u>ss than</u> ion of s nd profi Accident	ration of <u>ist up to</u> <u>1% of the</u> pecified le): type <u>AF</u>	f abn o eig e pla accio
	(4)	State cond: <u>hours</u> <u>life</u> Accie paran (a) (b)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case neter including p Temperature (°F) Pressure (psig)	urrence fr <u>max condi</u> nd will oc for any con eak, durat <u>212/110</u> 0.06	equenc tions cur le mbinat ion, a	y and du could ex ss than ion of s nd profi Accident Accident	ration or ist up to 1% of the pecified le): type <u>AF</u> type <u>AF</u>	f abn o eig e plan accid
	(4)	State cond: <u>hours</u> <u>life</u> Accie paran (a) (b) (c)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	urrence fr <u>max condi</u> nd will oc for any con eak, durat <u>212/110</u> 0.06 100	equenc tions cur le mbinat ion, a	y and du could ex ss than ion of s nd profi Accident Accident	ration or <u>ist up to</u> <u>1% of the</u> pecified le): type <u>AF</u> type <u>AF</u>	f abn o eig e pla acci CA/HE
	(4)	State cond: hours life Accie paran (a) (b) (c) (d)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	urrence fr <u>max condi</u> nd will oc for any con eak, durat <u>212/110</u> <u>0.06</u> <u>100</u> Less ₄ than <u>1x10 gamm</u>	equenc tions cur le mbinat ion, a 	y and du could ex ss than ion of s nd profi Accident Accident Accident	ration or ist up to 1% of the pecified le): type <u>AF</u> type <u>LOO</u> type <u>LOO</u>	f abn o eig e pla accio CA/HEI
	(4)	State cond: <u>hours</u> <u>life</u> Accid parar (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	urrence fr <u>max condi</u> nd will oc for any con eak, durat <u>212/110</u> 0.06 <u>100</u> Less4than <u>1x10 gamm</u> NA	equenc tions cur le mbinat ion, a a	y and du could ex ss than ion of s nd profi Accident Accident Accident Accident	ration or ist up to 1% of the 1% of the pecified le): type <u>AF</u> type <u>LOO</u> type <u>LOO</u> type <u>NA</u>	f abno o eigl e play accio CA/HEI CA/HEI
	(4)	State cond: hours life Accid paran (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	urrence fr <u>max condi</u> nd will oc for any con eak, durat <u>212/110</u> 0.06 <u>100</u> Less4than 1x10 gamm NA	equenc tions cur le mbinat ion, a 	y and du could ex ss than ion of s nd profi Accident Accident Accident Accident	ration or ist up to ist up to 1% of the pecified le): type <u>AF</u> type <u>LOO</u> type <u>LOO</u> type <u>NA</u>	f abno o eigl e plan accio CA/HEI CA/HEI
	(4)	State cond: hour: life Accie paran (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	urrence fr max condi nd will oc for any con eak, durat 212/110 0.06 100 Less4than 1x10 gamm NA	equenc tions cur le mbinat ion, au a	y and du could ex ss than ion of s nd profi Accident Accident Accident Accident	ration or ist up to 1% of the pecified le): type <u>AF</u> type <u>LOO</u> type <u>LOO</u> type <u>NA</u>	f abno o eigl e plan accio CA/HEI
· ·	(4)	State cond: hour: life Accie paran (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	urrence fr max condi nd will oc for any con eak, durat 212/110 0.06 100 Less4than 1x10 gamm NA	equenc tions cur le mbinat ion, au a	y and du could ex ss than ion of s nd profi Accident Accident Accident Accident	ration or ist up to 1% of the pecified le): type <u>AF</u> type <u>LOO</u> type <u>LOO</u> type <u>NA</u>	f abn(o_eig) e_plan acci(CA/HEI

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BINI	DER TI	TLE_FENWAL COMPUTED_BDM DATE 8-14-86 6 & 6 & 6 & 6 & 6 & 6 & 6 & 6 & 6 & 6 &
		CHECKED <u>AWL</u> DATE <u>8–16–86</u> <u>2429</u> 2~21-59
ĸ.	<u>REQU</u> (Con	IRED OPERATING ENVIRONMENT (Model No. 17323-0)(692' Rm A06) - tinued)
		Comments (duration/peak/profile/spray composition and pH, margin, etc.): <u>None</u>
	(6)	Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design basis accident conditions (Yes/No/NA)? Yes (Reference:
		*See comment Page B22).
	(7)	Subject to submergence (Yes/No/NA)? <u>No</u> (Reference: <u>See</u>
		page B30/A).
		Identify initiation time and duration of submergence: <u>NA</u>
	(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>NA</u> (Reference: <u>Environmental Data Drawing 47E235-68</u>).
•		If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify:
	(9) [,]	Special environmental calculations (temp., rad., etc.)
		Type RIMS No.

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BINDER NO. WBNEO-ITS-001	PLANT <u>WBN</u>	UNIT(S)_1	
BINDER TITLE FENWAL	COMPUTED	BDM DATE	$\frac{R_{-1}}{8-14-86} \frac{R_{-1}}{\frac{1}{12}} \frac{R_{-1}}{\frac{1}{12}}$
;	CHECKED	AWL DATE	8-16-86 24-912
•	•		× ~ • /

K. <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

JUSTIFICATION/COMMENTS

*The Environmental Data Drawing 47E235-68, Note 49 requires addi- R1 tional conduit sealing; however, Fenwal model numbers located in this room (692' Rm A06) are 17323-0 which have vendor supplied seals (see TAB F) on lead wires and adjustment knob.

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к. <u>Req</u>		·····	CHECKED AV			
K. <u>REQ</u>				DATEM _	<u>/-2-86 HD</u> 2/	<u>R</u> 21/89
	UIRED (OPERATING ENVIRON	<u>MENT</u> (Model I	No. 18023-7)		
Ref	erence	Environmental Dr	awing No. <u>471</u> and	235-39, (72 1 DCA-P-0235	9' Rm A06 1-06-0, -) 07–0
(1)	Norma	al Max	(2)	Abnormal Max		
	(a)	Temperature (°F)	<u>104</u>	(a) Tempera	ture (°F)	<u>110</u>
	(b)	Pressure (psig)	<u>ATM(-)</u>	(b) Pressur	e (psig)	ATM(
	(c)	Humidity (%)	<u>80 </u>	(c) Humidity	y (%)	<u>90</u>
	(d)	Radiation (rd)	1.8x10 ³ gamma	(d) Radiatio	on (rd)	<u>NA</u>
(3)	Proc	ess Int <u>erfaces</u> :	None		· · · · · · · · · · · · · · · · · · ·	
(3)	Proc	ess Interfaces:	None			<u> </u>
(3) (4)	Proce State cond: <u>eight</u>	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> t hours per excur	None urrence freque maximum conc sion and will	iency and du litions could Loccur less	ration of i exist f than 1%	abno or up of th
(3) (4)	State cond: <u>eigh</u>	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u>	None urrence freque maximum conc sion and wil:	lency and du litions could loccur less	ration of <u>i exist f</u> than 1%	abno or up of th
(3) (4) (5)	State cond: <u>eight</u> <u>plan</u> Accie para	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p	None urrence frequ maximum cono sion and wil: for any comb: eak, duration	nency and du litions could l occur less lnation of s n, and profi	ration of <u>i exist f</u> <u>than 1%</u> pecified le):	abno or up of th accid
(3) (4) (5)	Proce State cond: <u>eigh</u> <u>plan</u> Accie para (a)	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F)	None urrence freque maximum cond sion and will for any combe eak, duration 116°F (@ 1 m 125°F (PK)	lency and du litions could l occur less ination of s n, and profi- nin) Accident	ration of <u>i exist f</u> than 1% pecified le): type <u>AB</u>	abno or up of th accid
(3) (4) (5)	Proce State cond: <u>eight</u> <u>plant</u> Accie parat (a) (b)	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig)	None urrence frequ maximum cond sion and will for any comb: eak, duration 116°F (@ 1 m 125°F (PK) 0.15	lency and du litions could loccur less lnation of sy h, and profi- nin) Accident Accident	ration of <u>i exist f</u> <u>than 1%</u> pecified le): type <u>AB</u> type <u>AB</u>	abno or up of th accid
(3) (4) (5)	Proce State cond: <u>eigh</u> <u>plan</u> Accie para (a) (b) (c)	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	None urrence freque maximum cond sion and will for any comb: eak, duration 116°F (@ 1 m 125°F (PK) 0.15 100	lency and du litions could loccur less lnation of s n, and profi- nin) Accident Accident Accident	ration of <u>i exist f</u> <u>than 1%</u> pecified le): type <u>AB</u> type <u>AB</u>	abno or up of th accid
(3) (4) (5)	Proce State cond: <u>eigh</u> <u>plan</u> Accie para (a) (b) (c) (d)	ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	None urrence freque maximum cond sion and will for any combi- eak, duration 116°F (@ 1 m 125°F (PK) 0.15 100 1.3x10 gamma	lency and du litions could l occur less ination of syn, and profinin) Accident Accident Accident Accident	ration of <u>i exist f</u> <u>than 1%</u> pecified le): type <u>AB</u> type <u>AB</u> type <u>AB</u>	abno or up of th accid

WBEP-0094Q

BINDER	TITLEFENWAL	COMPUTED <u>BDM</u>	DATE <u>8-14-86 56 47</u>
		CHECKED AWL	DATE <u>8-16-86</u> <u>262</u> 2-21-64
к. <u>R</u> (EQUIRED OPERATING ENV) Continued)	<u>IRONMENT</u> (Model No.	
	Comments (duration margin, etc.): <u>No</u>	n/peak/profile/spra one	y composition and pH,
			·····
(6) Is the equipment s can affect the per accident condition	subject to moisture formance of the eq ns (Yes/No/NA)? <u>No</u>	or liquid intrusion wh uipment under design bas (Reference: <u>Drawin</u>
	47E235-39 does not	<u>require conduit s</u>	ealing analysis
(7) Subject to submerg	gence (Yes/No/NA)?	<u>No</u> (Reference: <u>See</u>
	page B30/A		
	Identify initiation	on time and duratio	n of submergence: <u>NA</u>
	· · · · · · · · · · · · · · · · · · ·		······
(8) Is the equipment s the total accident (Reference: <u>Drawi</u>	ubject to a beta r dose (Yes/No/NA)? ng 47E235-39	adiation contribution to
	If yes, identify t beta dose to be ad	the fraction of the ded to the total d	unattenuated free field ose and justify:
			· · · · · · · · · · · · · · · · · · ·
()	9) Special environmen	tal calculations (temp., rad., etc.)
	Type		RIMS No.
			_

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	CR 11	TLE <u>)</u>	FENWAL.	COMPUTED_	AWL	DATE <u>5-15-80</u>	6 <u>EEM</u> 2/21/ 6 <u>HDR</u> 2/21/
к.	REQU	IRED	OPERATING ENVIRON	<u>MENT</u> (Mode	l No.	18023-7)	
	Refe	rence	Environmental Dr	awing No.	47E235 and DC	<u>-40, (692' Rm)</u> A-P-02351-08-0	<u>A14)</u> , -09-0
	(1)	Norma	al Max	(2)	Abno	rmal Max	
		(a)	Temperature (°F)	<u>104</u>	(a)	Temperature (°F) <u>110</u>
		(b)	Pressure (psig)	<u>ATM(-)</u>	(b)	Pressure (psig	g) <u>ATM</u>
		(c)	Humidity (%)	80	(c)	Humidity (%).	<u>90</u>
		(d)	Radiation (rd)	3.5x10 ⁴ gamma	(d)	Radiation (rd)) <u>NA</u>
	(3)	Proc	ess Interfaces:	None			•
						······	
	(4)	State cond: eight plant	e anticipated occ itions: <u>Abnormal</u> t hours per excur : life.	urrence fr maximum c sion and w	equency onditio	y and duration ons could exist cur less than 1	of abr t for u 1% of t
	(4) (5)	State cond: <u>eight</u> <u>plant</u> Accic param	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> ient (worst case meter including p	urrence fr <u>maximum c</u> sion and w for any con eak, durat	equency ondition ill occurs nbination, ar	y and duration ons could exist cur less than 1 ion of specifie nd profile):	of abr <u>t for t</u> 1% of t ed acci
	(4) (5)	State cond: <u>eight</u> <u>plant</u> Accie paran (a)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>: life.</u> ient (worst case meter including po Temperature (°F)	urrence fr <u>maximum c</u> sion and w for any con eak, durat: <u>143</u>	equency ondition ill occ nbination, ar	y and duration ons could exist cur less than 1 ion of specifie nd profile): Accident type A	of abr <u>t for t</u> 1% of t ed acci
	(4)	State cond: <u>eight</u> <u>plant</u> Accic paran (a) (b)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> lent (worst case meter including po Temperature (°F) Pressure (psig)	urrence fr <u>maximum c</u> sion and w for any con eak, durat: <u>143</u> 0.15	equency onditio ill oco mbinati ion, ar	y and duration ons could exist cur less than 1 ion of specifie ad profile): Accident type A	of abr <u>t for t</u> 1% of t ed acci
	(4)	State cond: <u>eight</u> <u>plant</u> Accie paran (a) (b) (c)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>: life.</u> ient (worst case meter including por Temperature (°F) Pressure (psig) Humidity (%)	urrence fr <u>maximum c</u> sion and w for any con eak, durat: <u>143</u> 0.15 100	equency ondition ill occ nbination, ar A	y and duration ons could exist cur less than 1 ion of specifie nd profile): Accident type <u>A</u> Accident type <u>A</u> Accident type <u>A</u>	of abr <u>t for t</u> 1% of t ed acci AB AB
	(4)	State cond: <u>eight</u> <u>plant</u> Accie paran (a) (b) (c) (d)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> ient (worst case meter including por Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	urrence fr maximum c sion and w for any con eak, durat: 143 0.15 100 Less4than 1x10 gamma	equency ondition ill occo mbination, ar A A	y and duration ons could exist cur less than 1 ion of specifie ad profile): Accident type <u>A</u> Accident type <u>A</u> Accident type <u>A</u> Accident type <u>A</u>	of abr <u>t for t</u> 1% of t ed acci 1B 1B
	(4)	State cond: <u>eight</u> <u>plant</u> Accie paran (a) (b) (c) (d) (c)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> ient (worst case meter including por Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	urrence fr maximum c sion and w for any con eak, durat: 143 0,15 100 Less ₄ than 1x10 gamma NA	equency ondition ill occ nbination, ar A A A	y and duration ons could exist cur less than 1 ion of specifie nd profile): Accident type A Accident type A Accident type A Accident type L Accident type N	of abi t for t 1% of t ed acci AB AB
- -	(4)	State cond: eight plant Accio paran (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>c life.</u> lent (worst case meter including po Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	urrence fr <u>maximum c</u> <u>sion and w</u> for any con eak, durat: <u>143</u> 0.15 <u>100</u> Less ₄ than <u>1x10 gamma</u> <u>NA</u>	equency ondition ill occo mbination, ar A A A	y and duration ons could exist cur less than 1 ion of specifie ad profile): Accident type A Accident type A Accident type A Accident type I Accident type I	of abi t for t 1% of t ed acci AB AB AB

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BINDER TI	TLEFENWAL	_ COMPUTED_	BDM DAT	E <u>8-14-86</u> 2011 3/3/1/99
	<u>\</u>	_ CHECKED	AWL DAT	E <u>8-16-86</u> 1-21-39
K. <u>REQU</u> (Con	IRED OPERATING ENVIRO	<u>NMENT</u> (Mode	1 No. 18023-	 7)(692' Rm A14)
	Comments (duration/p margin, etc.): <u>None</u>	eak/profile	/spray compo	sition and pH,
				~
(6)	Is the equipment sub can affect the perfor accident conditions	ject to moi rmance of t (Yes/No/NA)	sture or liq ne equipment ? <u>No</u> (R	uid intrusion w under design ba eference:
	Drawing 47E235-40 do	<u>es not requ</u>	ire_conduit_	sealing analysi
(7)	Subject to submergent	ce (Yes/No/)	NA)? <u>No</u>	(Reference: <u>See</u>
	Identify initiation	time and du	ration of su	omergence: <u>NA</u>
(8)	Is the equipment sub the total accident do (Reference: <u>47E235-</u>	ject to a be ose (Yes/No 40	eta radiation /NA)? <u>NA</u>	contribution
	If yes, identify the beta dose to be addee	fraction of to the to	the unatten tal dose and	uated free fie justify:
(9)	Special environmenta	l calculatio	ons (temp.,)	ad., etc.)
	Type		<u>R</u> ,	I <u>MS No.</u>
			······	

BINDER N	U. <u>WBN</u>	EU-115-001 PLANI_	COMPUTED	RDM		R_1 R1	<u>DZ7</u> <u>R</u>
			CHECKED	AWL	_ DATE <u>5</u>	<u>ر الم-15-8</u> 0 <u>//</u> مرحد	21189 1012 14-84
K. <u>REO</u> Pof	UIRED	OPERATING ENVIRON	MENT (Mode)	L No. 1	3023-7)	(713' R	
(1)	Norm	al May	(2)	Abnor			
	(a)	Temperature (°F)	<u>104</u>	(a) '	Temperat	ure (°F)	110
	(b)	Pressure (psig)	ATM(-)	(b) :	ressure	e (psig)	ATM
	(c)	Humidity (%)	$\frac{80}{4 \times 10^4}$	(c) 1	Humidity	r (%)	<u>90</u>
	(d)	Radiation (rd)	gamma (<u>zone D</u>)	(d)	Radiatio	on (rd)	<u>NA</u>
(3)	Proc	ess Interfaces:	None		·		
(4)	Stat	e anticipated occ itions: Abnormal	urrence fro	equency	and dur	ation of	abn
(4)	Stat cond <u>eigh</u> <u>plan</u> Acci para	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p	for any convert	equency ondition ill occu mbination, and	and dur <u>is could</u> <u>ir less</u> on of sp i profil	eation of <u>exist f</u> than 1% pecified e):	abn or u of t acci
(4) (5)	Stat cond <u>eigh</u> plan Acci para (a)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F)	for any cor 128	equency ondition ill occu mbination, and Ad	and dur <u>ns could</u> <u>ur less</u> on of sp i profil ccident	than 1% cecified ce):	abn or u of t acci
(4) (5)	Stat cond eigh plan Acci para (a) (b)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig)	for any cor 128 0.03	equency ondition ill occr mbination ion, and Ad	and durns could ur less on of sp i profil ccident	type <u>AB</u>	abn or u of t acci
(4) (5)	Stat cond <u>eigh</u> plan Acci para (a) (b) (c)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	for any conversion and with the second secon	equency ondition ill occu mbination, and ion, and ion, and Addition, Addition Addition	and dur ns could ur less on of sp i profil ccident ccident	type <u>AB</u>	abn or u of t acci
(4) (5)	Stat cond <u>eigh</u> <u>plan</u> Acci para (a) (b) (c) (d)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	for any con eak, durat: <u>128</u> 0.03 Less ₄ than <u>1x10 gamma</u>	equency ondition ill occu obination ion, and ion, and Addition Add	and durns could ur less on of sp i profil ccident ccident ccident	type <u>AB</u>	abn or u of t acci
(4) (5)	Stat cond eigh plan Acci para (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	for any cor reak, durat: 128 0.03 100 Less ₄ than 1x10 gamma	equency ondition ill occu mbination, and ion, and ion, and Ad Ad Ad Ad Ad	and durns could ur less on of sp i profil ccident ccident ccident	type <u>AB</u> type <u>AB</u> type <u>L</u>	abn or u of t acci
(4) (5)	Stat cond eigh plan Acci para (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	for any conversion and with the second secon	equency ondition ill occu mbination ion, and ion, and A A A A A	and durns could ur less on of sp i profil ccident ccident ccident ccident	type <u>AB</u> type <u>AB</u> type <u>L</u>	abn or u of t acci
(4) (5)	Stat cond eigh plan Acci para (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	for any conversion and with the second secon	equency ondition ill_occu mbination ion, and A A A A	and durns could ur less on of sp i profil ccident ccident ccident ccident	type <u>AB</u> type <u>AB</u> type <u>L</u>	abn or u of t acci
(4)	Stat cond eigh plan Acci para (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	for any con eak, durat: 128 0.03 100 Less ₄ than 1x10 gamma	equency ondition ill occu abination ion, and A A A A	and durns could ir less on of sp i profil ccident ccident ccident ccident	type <u>AB</u> type <u>AB</u> type <u>AB</u>	abn or u of t acci
(4)	Stat cond eigh plan Acci para (a) (b) (c) (d) (e)	e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	for any cor beak, durat: 128 0.03 100 Less ₄ than 1x10 gamma	equency ondition ill_occr mbination ion, and A A A A	and durns could ur less on of sp i profil ccident ccident ccident ccident	type AB type AB type <u>AB</u> type <u>AB</u>	abno or uj of ti accio

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DINDER 1	CITLE FENWAL COMPUTED BDM DATE 8-14-8	16 <u>8874</u> 3/31/89
	CHECKED <u>AWL</u> DATE <u>8-16-8</u>	6 <u>H1942</u> 2-21-57
K. <u>RE(</u> (Co	OUIRED OPERATING ENVIRONMENT (Model No. 18023-7)(713' ontinued)	Rm A01)-
	Comments (duration/peak/profile/spray composition a margin, etc.): <u>None</u>	nd pH,
(6)	To the environment subject to pointure on liquid intr	uning wh
(6)) is the equipment subject to moisture or liquid intr can affect the performance of the equipment under d accident conditions (Yes/No/NA)? <u>No</u> (Reference	esign bas
(7)	Drawing 47E235-52 does not require conduit sealing) Subject to submergence (Yes/No/NA)? <u>No</u> (Referen	<u>analysis</u> ce: <u>See</u>
	page B30/A Identify initiation time and duration of submergenc	e: <u>NA</u>
(8)) Is the equipment subject to a beta radiation contri the total accident dose (Yes/No/NA)? <u>NA</u> (Reference: <u>47E235-52</u>	bution to
	If yes, identify the fraction of the unattenuated f beta dose to be added to the total dose and justify	ree fiel :
	·····	
(9)) Special environmental calculations (temp., rad., et	c.)
(9)) Special environmental calculations (temp., rad., et <u>Type</u> <u>RIMS No.</u>	c.)

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SINDER T.		ENWAL	COMPUTED	BDM	DATE 5	<u>5-15-86</u> <u>E</u> 2	EM
			CHECKED	AWL	DATE 5	5 <u>-15-86</u> H	<u>DR</u>
к. <u>Requ</u>	JIRED (PERATING ENVIRON	MENT (Model	L No.	18023-7)		
Ref	erence	Environmental Dra	awing No. <u>4</u>	7E235 692' 19-0,	<u>-62, -63,</u> <u>Rm A01) a</u> -20-0	-64 and DCA-P	-02351
(1)	Norma	al Max	(2)	Abno	rmal Max	·	
	(a)	Temperature (°F)	104	(a)	Temperat	ure (°F)	110
	(b)	Pressure (psig)	<u>ATM(-) '</u>	(b)	Pressure	e (psig)	<u>ATM(-</u>
	(c)	Humidity (%)	80	(c)	Humidity	7 (%)	90
			3.2×10^4				
•		- - - - - - - - - -	gamma			<i>.</i>	
(3)	(d) Proce	Radiation (rd) ess Interfaces:	gamma <u>(zone_C</u>) None	(d)	Radiatio	on (rd)	<u>NA</u>
(3) (4)	(d) Proce	Radiation (rd) ess Interfaces: e anticipated occ itions: Abnormal	gamma (<u>zone_C</u>) None urrence fro	(d)	Radiatio	on (rd)	NA
(3) (4)	(d) Proce	Radiation (rd) ess Interfaces: e anticipated occ itions: <u>Abnormal</u> t hours per excur t life.	gamma (<u>zone_C</u>) None urrence fro <u>maximum co</u> sion and w	(d) equenc onditi ill oc	Radiatio y and dur ons could cur less	on (rd) ration of <u>1 exist f</u> than 1%	NA abnor or up of the
(3) (4) (5)	(d) Proce State cond: eight plan; Accie para	Radiation (rd) ess Interfaces: e anticipated occ itions: <u>Abnormal</u> t hours per excur t life. dent (worst case meter including p	gamma (<u>zone C</u>) None urrence fro <u>maximum co</u> sion and with for any con eak, durat:	(d) equenc onditi ill oc nbinat	Radiation y and dur ons could cur less ion of sy nd profi	on (rd) ration of <u>i exist f</u> than 1% pecified Le):	NA abnor or up of the accide
(3) (4) (5)	(d) Proce State cond: eight plant Accie paras (a)	Radiation (rd) ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F)	gamma (<u>zone C</u>) None urrence from maximum consistent sion and with for any conseak, durat: 153	(d) equenc onditi ill oc nbinat ion, a	Radiatio y and dur ons could cur less ion of sp nd profi Accident	on (rd) cation of <u>i exist f</u> than 1% pecified Le): type <u>AB</u>	NA abnor of the accide
(3) (4) (5)	<pre>(d) Proce State cond: eight plan; Accid param (a) (b)</pre>	Radiation (rd) ess Interfaces: e anticipated occ itions: <u>Abnormal</u> t hours per excur t life. dent (worst case meter including p Temperature (°F) Pressure (psig)	gamma (<u>zone_</u> C) None urrence fro <u>maximum cons</u> sion and with for any conseak, durat: <u>153</u> 0.03	(d) equenc onditi ill oc nbinat ion, a	Radiatio y and dur ons coulo cur less ion of sy nd profit Accident Accident	on (rd) ration of <u>i exist f</u> than 1% pecified Le): type <u>AB</u> type <u>AB</u>	NA abnor or up of the accide
(3) (4) (5)	<pre>(d) Proce State cond: eight plant Accid param (a) (b) (c)</pre>	Radiation (rd) ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	gamma (<u>zone C</u>) None urrence from maximum consistent sion and with for any conservation eak, durat: <u>153</u> 0.03 100	(d) equenc onditi ill oc mbinat ion, a	Radiatio y and dur ons could cur less ion of sy nd profi Accident Accident Accident	on (rd) cation of <u>1 exist f</u> than 1% pecified Le): type <u>AB</u> type <u>AB</u>	NA abnor of the accide
(3) (4) (5)	<pre>(d) Proce State cond: eight plan; Accid param (a) (b) (c) (d)</pre>	Radiation (rd) ess Interfaces: e anticipated occ itions: <u>Abnormal</u> <u>t hours per excur</u> <u>t life.</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	gamma (<u>zone_C</u>) None urrence from maximum construction sion and with for any construction for any construction fo	(d) equenc onditi ill oc nbinat ion, a	Radiatio y and dur ons could cur less ion of sy nd profit Accident Accident Accident	on (rd) ration of <u>i exist f</u> than 1% pecified Le): type <u>AB</u> type <u>AB</u> type <u>AB</u>	NA abnor or up of the accide

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SINDER TI	TLEFENWAL	_ COMPUTEDBD	<u>1</u> DATE <u>8-14-86</u>	EEM
		CHECKEDAW	DATE <u>8-16-8</u> 6_	74.9R
• • • • • • •		<u> </u>	2	-24-39
K. <u>REQU</u> (Con	IRED OPERATING ENVIRO tinued) Comments (duration/p margin, etc.): None	<u>NMENT</u> (Model No eak/profile/sp	o. 18023-7)(692' Rm	АО1)-
				<u></u> _
(6)	Is the equipment sub can affect the perfo accident conditions	ject to moistu: rmance of the (Yes/No/NA)? <u>N</u> a	re or liquid intrus equipment under des (Reference:	ion which ign basis <u>Drawing</u>
	47E235-62 does not r	<u>equire conduit</u>	sealing analysis).
(7)	Subject to submergen	ce (Yes/No/NA)	<u>No</u> (Reference	: <u>See</u>
	page B30/A		•).
	Identify initiation	time and durat:	ion of submergence:	<u>NA</u>
		<u></u>	· · ·	
	·			
(8)	Is the equipment sub the total accident d (Reference: <u>47E235-</u>	ject to a beta ose (Yes/No/NA 62	radiation contribu)? <u>NA</u>	tion to
	If yes, identify the beta dose to be adde	fraction of the total	ne unattenuated fre dose and justify:	e field
•			· ·	
(9)	Special environmenta	l calculations	(temp., rad., etc.)
	Type		RIMS No.	
			· · · ·	
•			- <u>-</u>	

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PAGE B-32 R1

BINDER NO. <u>WBNEQ-IT</u>	<u>S-001</u> PLANT <u>WB</u>	NUNIT(S)1	SHEET <u></u> OF40
BINDER TITLE <u>FENWA</u>	L CO	MPUTED BDM DATE	R_1 R 8-18-86 <u>EEM</u>
	Сн	ECKED AWL DATE	8-25-86 400
			2-21-37
	· · · · ·		
	SUBMER	GENCE EVALUATION	-
	ACTIVAT.	FT.OOR FLEV/RM #/	MAX FLOOD ELEV
Component	ELEVATION	REQUIRED ACCIDENT	(From 47E235- R1
(As listed TAB A)	(From TAB F)	(From TAB A)	Series Drawings)
1-TS-1-17A-A	*695'-9"	692'/A06/L,AF	692'-2"
1-TS-1-17B-A	*695'-9"	692'/A06/L,AF	692'-2"
1-TS-1-18A-B	*695'-9"	692'/A06/L,AF	692'-2"
1-TS-1-18B-B	*695'-9"	692'/A06/L,AF	692'-2"
0-TS-12-91A-A	735'-9"	729'/A06/AB	NA
0-TS-12-91B-B	735 ' – 9''	729'/A06/AB	NA
0-TS-12-92A-A	724'-0"	692'/A14/AB	692'-1"
0-TS-12-92B-B	724'-0"	692'/A14/AB	692'-1"
0-TS-12-93A-A	- 715 ' 7''	713'/A01/AB	713'-1"
0-TS-12-93B-B	715'-10"	713'/A01/AB	713'-1"
0-TS-12-95A-A	705 '2''	692'/A01/AB	692'-1"
0-TS-12-95B-B	69 8'-9''	692'/A01/AB	- 692'-1" . R1
0-TS-12-96A-A	707 '0''	692'/A01/AB	692'-1''
0-TS-12-96B-B	706'-1"	692'/A01/AB	692'-1"
0-TS-12-98A-A	701'-4"	692'/A01/AB	692'-1"
0-TS-12-98B-B	700'-11"	692'/A01/AB	692'-1"
0-TS-12-99A-A	721'-6"	692'/A14/AB	692'-1"
0-TS-12-99B-B	724'-0"	692'/A14/AB	692'-1"

All temperature switches are located at least 2 feet above respective floor elevations. From Auxiliary Building Environmental Data Drawings, R1 flood levels for AB or AF HELBs do not exceed 1 foot; therefore, no switches are subject to submergence.

*Elevation measured to bottom of J.B. switches have the "flange" type mounting (see TAB H. 1.10.K) and are mounted on J.B. above low-point of J.B.



PAGE B-33 R1

	ED <u>61.</u> DAT مربط	re <u>570-56</u>
СНЕСКЕ	Q1. x	
	DA102 DA1	TE 5/20/86
		/ /
OCNDITIONS_1	O SPECIFIED CO	<u>NDITIONS</u>
se maximum p	arameters: (M/	N 17323-0)
<u>Specified</u>	Demonstrated	Reference
100 dava	24 hours	Tab D pg iii, X Sect. X (3.0)
<u>100 days</u>	<u>_24_N0010_</u>	Tab D Sect. X
<u>212°F</u>	<u>323 °F</u>	(Fig X-1, pg X-3)
0.06	7.9	Sect. X (Fig_X-2)
		Tab D, Sect. XIII
	100%	(3.10.3, pg_39
<u>NA</u>	NA	<u>NA</u>
1.18×10^4		See pg B12 (H5-C)
ganma	<u>_NA</u>	Tab D Sect. II(1.1)
No	<u>No</u>	See page B30/A
ration, flow ed normal do	rate, density, se plus integr	duration, and pH. ated accident dose
se profiles	and margin ass	essment:
	se maximum p <u>Specified</u> <u>100 davs</u> <u>212°F</u> <u>0.06</u> <u>100%</u> <u>NA</u> 1.18 x 10 ⁴ <u>gamma</u> <u>No</u> ration, flow ed normal do se profiles Te	se maximum parameters: (M/ <u>Specified</u> <u>Demonstrated</u> <u>100 days</u> <u>24 hours</u> <u>212°F</u> <u>323°F</u> <u>0.06</u> <u>7.9</u> <u>100%</u> <u>100%</u> <u>NA</u> <u>NA</u> <u>1.18 x 10⁴</u> <u>gamma</u> <u>NA</u> <u>No</u> <u>No</u> ration, flowrate, density, ed normal dose plus integr se profiles and margin ass Test Profile

Parameter	Test Profile E nv elops Specified <u>(Yes/No/NA)</u>	Reference
Temperature	<u>Yes (See sheet B32)</u>	Tab D Sect. X (3.0) Tab D Sect. X Figs. X-3, X-4
Pressure	Yes (See sheet B32)	Tab D Sect. X (3.0) Figs. X-3, X-4
Relative Humidity	Yes	Tab D, Sect. XIII (3.10.3, pg 39)
Chemical Spray	NA	NA
Submergence	<u>NA</u>	NA

PAGE <u>B-34</u>

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R_1 R_ BINDER TITLE FENWAL COMPUTED BDM DATE $5-15-86$ $\mathcal{E} \in \mathcal{I} \cap \mathcal{I}$ BINDER TITLE FENWAL COMPUTED BDM DATE $5-15-86$ $\mathcal{E} \in \mathcal{I} \cap \mathcal{I}$ CHECKED AWL DATE $5-15-86$ $\mathcal{I} \in \mathcal{I} \cap \mathcal{I}$	BINDER	NO. <u>WB</u>	NEQ-ITS-001	PLANT_	WBN	UNIT(S)_	1	SHEET_B32_	0F <u>40</u>
CHECKED AWL DATE 5-15-86 //+92	BINDER	TITLE	FENWAL		COMPUTED	BDM	DATE	R <u>1</u> R 5-15-86 <u><i>EE</i>27</u> 2/27/89	
2-21-89					CHECKED	AWL	DATE	<u>5-15-86 /+9e</u> 2-21-89	

L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS</u> (Continued)

JUSTIFICATION/COMMENTS

*The 24 hour duration test profile envelops the accident profile for the AF HELB specified in the category and operating time calculation for System 1 which is the only DBE which results in a R1 harsh environment. The 100-day post-DBE operability requirement is from a category B/LOCA requirement for these devices (M/N 17323-0). However, the environmental conditions resulting from a LOCA are essentially mild. (See K(5) page B20). The 100day post-LOCA operability requirement is accounted for due to the 5 demonstrated qualified life being 40.56 years (see TAB C, page C-2, $\frac{1}{5}$ Section H(8), but only a 40-year qualified life is specified on the QMDSs.

BINDER TIT	TLE COMPUTED 60	M DATE 5-	15-86
	CHECKED AN	L DATE 5-1	15-36
L. SUMM	ARY COMPARISON OF TEST CONDITIONS TO SPECI	FIED CONDITI	ONS M/N 17323-0)
	······································		(Continued)
(3)	Were margins applied to the test paramete the test program to assure that normal va accounted for? (Note margin applied, yes/	ers or otherwariation and a no/NA)	ise addressed in uncertainties ar
	Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/NA
	Temperature: +15 degrees F	+111 °F	Yes
	Pressure: +10% but no more than 10 psig	+7.84_psig	Yes
*	Radiation: +10% of accident dose	NA	<u>NA</u>
	Time: +10% (or 1 hour + operating time per NUREG-0588)	10%	Yes
	Voltage: +10% of rated value	10%	Yes
	Frequency: +5% of rated value	NA	NA
	Environmental Transient: the initial transient and the peak temperature applied twice	Margin of 111°F	Yes
	Vibration: +10% added to acceleration	NA	NA
	JUSTIFICATION/COMMENTS: <u>*See Page B12.</u>		· · · ·
			· · · · · · · · · · · · · · · · · · ·
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TVA 19537 (OE-3-86)

NDER I	IILE		$\frac{pp}{2} = \chi_{4} \pi^2 = p$	ATE <u>5-0,06</u>
		CHECKI	ED TRUE D	ATE / 23/ 86
. <u>Sur</u>	MARY COMPARISON OF TEST	CONDITIONS	TO SPECIFIED C	CONDITIONS
(1)) Comparison of worst-ca	ise maximum	parameters: (M	1/N 18023-7)
	Parameter	<u>Specified</u>	Demonstrated	Reference
	Operating Time	<u>l minute</u>	<u>100 days</u>	<u>Tab_D_SectX_(3.0)</u>
	Temperature (°F)	<u>153°F</u>	323°F	Tab D Sect. X (Fig X-1, pg X-3)
	Pressure (psig)	0.15	7.9	Tab D Sect. X (Fig X-2)
	Relative Humidity (%)	100%	100%	Tab D, Sect. XIII (3.10.3, pg 39)
	*Chemical Spray	<u>NA</u>	NA	<u>NA</u>
	•	Less than 5 x 10		
	Radiation (rd)	_Gamma	<u>_NA</u>	Tab D Sect. II(1.1)
	Submergence	<u>No</u>	No	See pg B30/A

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	<u>Tab D Sect. X (3.0)</u> Sect. X Figs. <u>Tab D X-3, X-4</u> Sect. X (3.0)
Pressure	Yes	Sect. X (3.0) Sect. X Figs. <u>Tab D X-3, X-4</u> Tab D, Sect XIII
Relative Humidity	Yes	(3.10.3, pg 39)
Submergence	NANA	<u>NA</u>
JUSTIFICATION/COMMENTS		

PAGE <u>B37</u>

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	CHECKED Had	<u>گ</u> DATE <u>3</u> /	16/86
L. SUM	MARY COMPARISON OF TEST CONDITIONS TO SPEC	IFIED_CONDITI	<u>ONS</u> (M/N 18023-7) (Continued)
(3)	Were margins applied to the test paramete the test program to assure that normal va accounted for? (Note margin applied, yes	ers or otherw ariation and (/no/NA)	ise addressed in uncertainties are
·	Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/NA
	Temperature: +15 degrees F	+170°F	Yes
	Pressure: +10% but no more than 10 psig	<u>+7.75 psig</u>	Yes
	* Radiation: +10% of accident dose	<u>NA</u>	<u>NA</u>
:	Time: +10% (or 1 hour + operating time per NUREG-0588)	10%	Yes
	Voltage: +10% of rated value	10%	Yes
	Frequency: +5% of rated value	<u>NA</u>	<u>NA</u>
	Environmental Transient: the initial transient and the peak temperature applied twice	Margin of 170°F	Yes
	Vibration: +10% added to acceleration	NA	<u>NA</u>
	JUSTIFICATION/COMMENTS: <u>* See Page B12</u>		e . e
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	· ·		ja da na san a na an a
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	CHECKED <u>AWL</u> DATE <u>5-16-86</u> 2-21-29
M. OPER	ABILITY TEST RESULTS
(1)	Identify the safety function(s) of this equipment: (Reference: <u>See page B-2 for category and operating time</u> assignments
	JUSTIFICATION/COMMENTS
(2)	Did the equipment perform its intended function during the simulated design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D. Section X (3.0)</u>
	JUSTIFICATION/COMMENTS
(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D. Sections X (3.0).</u> XI
	JUSTIFICATION/COMMENTS
(4)	Did the test demonstrate the operability requirements for required time interval for which the equipment is required operate (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, page X,</u> Section X (3.0)
	JUSTIFICATION/COMMENTS
	Abnormal Conditions: Were abnormal conditions or anomalie
(5)	properly addressed and resolved (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Page iv-xi</u>

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BINDER NO. WBNEQ-ITS-001 PLAN	T <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>B36/A</u> OF <u>40</u>
BINDER TITLE FENWAL	COMPUTED BDM	$\begin{array}{c} R \underline{1} R \underline{1} \\ DATE \underline{5-20-86} \underbrace{\mathcal{EEM}}_{\mathcal{FI}} \underline{\mathcal{EI}} \end{array}$
······································	CHECKEDAWL	DATE <u>5-20-86</u> <u>Hor</u>

M. <u>OPERABILITY TEST RESULTS</u> (Continued)

JUSTIFICATION/COMMENTS

*There were 23 anomalies which occurred during testing. Of the 23, 10 anomalies (#'s 3, 4, 6, 8/A, 16, 17, 20, 21, 22/A, 23) involved specimens 7-9 and 13-15 (M.N.'s 17323-0, and 18023-7, respectively.) The anomalies are summarized on pages iv-xi of the Wyle report. Anomaly resolutions were reviewed and concurred with. Resolution of anomaly 22/A will be evaluated upon receipt of the revised demonstrated and required accuracy calculations (see open item 3, sheet B1).

R1

BIND	ER NO. WBNEQ-1	TS-001	PLANT_	WBN	UNIT(S)	1	SHEE	т <u></u> с)F _
BIND	FENWA	L		COM	PUTED BOR	DATE	5-15-84	R R	
					CKED ANIS		5-16-86		
				Une	CRED _1101A_	DATE			
N.	MAINTENANCE A	ND SURV	VEILLANC	CE					
	Has the quali and inspectic which aid in (yes/no/NA)? Binder - Qual	fication n param detection <u>Yes</u> ification	on progr neters v ing degr (Ent ion Mair	ram identi which are rading mat ter all re ntenance D	fied those s essential to erials or eq quirements i ata Sheets).	urveilla maintai uipment n Sectio	nce, main n qualifi performan n G of th	tenance, cation a ce e EQC	nd
	JUSTIFICATION	COMMEN	NTS All	<u>l requirem</u>	ents_entered	in QMDS	<u>s.</u>		
							· _		
	 , ,		· · · ·		<u> </u>				
						<u></u>			
					· · · · · · · · · · · ·			 	
	4017-70-01-0-0	· · · ·	· .				· · · · · · · · · · · · · · · · · · ·	, , , , , , , , , , , , , , , , , , ,	
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BIN	IDER TITLE FENWAL COMPUTED COMPUTED CHECKED	Bom DATE 54-86 " H H
0.	SUMMARY OF REVIEW	Yes/No/NA
	 Documented evidence of qualification adeq (Have all assumptions, mathematical mod all extrapolations of test data used in analysis been justified and documented) 	uate <u>Yes</u> els, and an ?
	(2) Any exceptions (i.e., sound reasons to the taken to the specified qualification le adequately justified?	e contrary) <u>NA</u> vel
	(3) Choice of qualification methodology adequation justified?	ately <u>Yes</u>
	(4) If analysis was performed, complete the f	ollowing:
	(a) Were equipment performance requirement identified?	ts <u>NA</u>
•	(b) Were specific features and failure modes of the specific features and failure modes of the specific features and failure modes and the specific features and the specific	des and <u>NA</u>
	(c) Were assumptions and mathematical mode together with appropriate justification their use?	els used tion forNA
	(d) Were environmental parameters which an equipment performance identified?	ffectNA
	(5) Adequate similarity between equipment and specimen established?	testYes
	(6) Aging degradation evaluated adequately?	Yes
	(a) Mechanical and/or cycle aging addresse	ed? Yes
	(b) Equipment aged to end of life condition application of DBE conditions?	on prior to <u>Yes</u>
	(c) Absence of preaging in test/analysis j	justified? <u>NA</u>
	(d) Materials susceptible to thermal/radia	tion <u>Yes</u>

PAGE B-4-2

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BINDER NO	WBNEQ-ITS-001 WBN UNIT(S)	
BINDER TIT	LE COMPUTED DATE	R R
	CHECKED ALL DATE	25/86
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
0. <u>SUMM</u>	<u>ARI OF REVIEW</u> (Continued)	Yes/No/NA
" <b>(</b>	(e) Normally operating state of device (e.g., normally energized) considered?	Yes
(7) (	Qualified life or replacement schedule established?	Yes
(8) (	Criteria regarding temperature/pressure exposure satisfied?	Yes
(	a) Peak temperature adequate	Yes
(	(b) Peak pressure adequate	Yes
. (	(c) Duration adequate	Yes
(	(d) Required profile enveloped adequately	Yes
(	(e) Steam exposure adequate	Yes
(9) (	Criteria regarding test sequence satisfied?	Yes
(10) (	Criteria regarding spray satisfied?	NA
(	(a) Was the spray testing done while under the extremes of pressure and temperature?	<u>NA</u>
(	(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed those to be used for the plant?	<u>NA</u>
(11) (	Criteria regarding submergence satisfied?	Yes
(12) (	Criteria regarding radiation satisfied?	Yes
(	(a) Was dose rate considered?	<u>NA</u>
(	(b) Was beta radiation considered?	<u>NA</u>
(13)	Criteria regarding operability status/mode satisfied?	Yes
(14)	Criteria regarding test failures or anomalies satisfied?	Yes

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BIND	ER NO.	WBNE	Q-ITS-001 PLANT_	WBN	UNIT(S)_	1	_ SHEE	T <u>B40</u> OF <u>4</u>
BIND	ER TII	LE <u>F</u>	ENWAL	COMPUTED_	BDM	DATE	к. <u>9-3-86</u>	EEM 887
				CHECKED	AWL	DATE	<u>9–3–86</u>	HDR <u>Auc</u> 2/21/89
0.	Summa	RY OF	REVIEW (Continu	ed)				
_							,	<u>Yes/No/NA</u>
•	(15)	Crite	ria regarding fu	nctional t	esting s	atisfi	ied?	<u>Yes</u>
		(a)	Does the test pla acceptance crite:	an/report ria for ec	specify uipment	an perfoi	med?	Yes
		(b)	Was an initial ba establish require	ase line t ed perform	est done ance cha	to ractei	ristics	? <u> Yes</u>
		(c)	Has the test ana performance spec (e.g., voltage,	lyis demon ifications load frequ	strated and cha ency, an	that racter d othe	ristics er	
			electrical chara	cteristics	) can be	ensui	red?	Yes
	(16)	Crit	eria regarding in	nstrument	accuracy	satis	sfied?	**
	(17)	Test sati	duration margin sfied?	(1 hour +	• functio	n tíme	2)	Yes
	هـ	(a)	Is the minimum a least 1 hour?	specified	operatin	g time	e at	Yes
		(b)	If exception to time was taken, provided?	the 1-hou was adequ	ur minimu Late just	m open ificat	rating tion	NA
	(18)	Crit	eria regarding s	ynergistic	effects	satis	sfied?	Yes
	(19)	Crit	eria regarding m	argins sat	isfied?			Yes
	(20)	Main adeq	tenance and surve uately identified	eillance 1 d?	equireme	nts		Yes
Ρ.	DISCU	SSION						
	<u>**See</u>	open	item 3. sheet B	2				
	·					<u>.                                    </u>		
		· ····	······					
							×	

BINDER TITLE ^{STATIC-0-RING} TEMPERATURE SWITCHES	WBN UNIT(S) COMPUTED CHECKED CHECKED	1 SHEET _1 R DATE <u>S - 22-8%</u> DATE <u>6/3/86</u>	OF <u>1</u> 	00-51T
		••••	•	
TAB A - Identification	of equipment comprisi	ng the equipment type	3	
	PAGE A-1		EQP136.51	

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BINDER NO. : WBNEQ-ITS -002 MANUFACTURER : SOR PAGE 1 OF 6

R4

# PRINT 6 25/89



-LOCATION	<u>Cat</u> (2)	<u>OPER TIME</u>	<u>event</u>	SAFETY FUNCTION
692 A29 85KLC-837662	A	IMN	AB	DETECT STEAM LINE BREAK AND ISOLATE FLOW FROM THE TURBINE BLDG TO AUX BLDG.
692' A29 86PLB-376059	A	IMIN	AB	DETECT STEAM LINE BREAK AND ISOLATE FLOW FROM THE TURBINE BLDG TO AUX BLDG.
692' A30 85KLC-837662	A	IMIN	AB	DETECT STEAM LINE BREAK AND ISOLATE FLOW FROM THE TURBINE BLDG TO AUX BLDG.
692' A30 85KLC-837662 '	A	1MIN	AB	DETECT STEAM LINE BREAK AND ISOLATE FLOW FROM THE TURBINE BLDG TO AUX BLDG.
737' A01 84K2-835754	Â A A A A	100D 1M0 1M0 1M0 1M0 1M0	L RH/A CV/A AF AB	IF ASSOCIATED HS IN AUTO, TEMP SWITCH REQUIRED TO START ROOM COOLER FAN ON HIGH TEMP.
PREPARER/DATE CHECKED/DATE	<u></u> <u>BI</u> AV	) M V L		R 1 R 3 R 4 WCG WCG WCD 4-4-59 10-12-59 6-14-90 KBN HDR QAA 4-28-89 10-18-59 6/27/90
	-LOCATION- ELEV(1) RM/RAD CONTRACT 692 & A29 85KLC-837662 692 & A29 86PLB-376059 692 & A30 85KLC-837662 692 & A30 85KLC-837662 737 & A01 84K2-835754 PREPARER/DATE CHECKED/DATE	LOCATION	$\frac{LOCATION}{ELEV(11)}  \underline{RM/RAD}  \underline{CAT}  \underline{OPER}  \underline{IIME}$ $\frac{692'}{85KLC-837662}  A  1MN$ $\frac{692'}{86PLB-376059}  A  1MIN$ $\frac{692'}{85KLC-837662}  A  1MIN$ $\frac{692'}{85KLC-837662}  A  1MIN$ $\frac{692'}{85KLC-837662}  A  1MIN$ $\frac{692'}{85KLC-837662}  A  1MIN$ $\frac{737'}{84K2-835754}  A  100D$ $A  1MO$ $A  1MO$ $A  1MO$ $A  1MO$ $A  1MO$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $



PRINT DATE: 02/02/39 .

SINDER NO. : W3NEQ-ITS -002 MANUFACTURER : SOR PAGE 2 OF 6

4/28/89

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#### WATTS BAR NUCLEAR PLANT TASA - FOUIPMENT IDENTIFICATION NATRIX

	-1 OC AT I ON			
EQIS_NUBBER UNIL_DEVICE_IQ_NOL AIMITH_ DESCRIPTION MQDEL_NUBBER	ELEVII) BUCBAD CONIBACI	CAI QPER_IIME	EYENI	SFEELX ERNCIION
WBN-D-TS -030-01928 -A 0-TS -030-01928 -A SFP & Therm Barrier BSTR Pump Cooler Fan 201tab125jjttx5	737° AO1 85KJ2-336755	A 1000 A 1M0 A 1M0 A 1M0 A 1M0 A 1M0	L RH/A CV/A AF AB	IF ASSOCIATED HS IN STANDBY, TEMP SWITCH IS REQUIRED TO CLOSE ON ROOM HIGH TEMP.
WBN-J-TS -030-0193A -9 0-TS -030-0193A -9 SFP 3 THERM BARRIER BSTR PUMP COOLER FAN 201TAB125JJTTX6	737' A ⁰ 1 84K2-835754	A 100D A 1M0 A 1M3 A 1M4 A 1M4 A 1M4	L RH/A CV/A AF AB	IF ASSOCIATED HS IN AUTO, TEMP Switch Required to start Room cooler fan on high temp.
WBN-D-TS -030-0193B -B 0-TS -030-0193B -B SFP % THERM BARRIER BSTR PUMP COOLER FAN 201TAB125JJTTX6	737" A01 85KN2-836755	A 1000 A 1m0 A 1m0 A 1m0 A 1m0 A 1m0	L RH/A CV/A AF AB	IF ASSOCIATED HS IN STANDBY, T REQD TO CLOSE ON ROOM HIGH TEM
WEN-1-TS -030-0194A -A 1-TS -030-0194A -A PENETRATION ROOM COOLER FAN 201TA9125JJTTX0	737" 405 83xJ9-833871	- A 1005 A 140 A 140 A 140 A 140 A 150	L RH/A CV/A AF AB	IF ASSOCIATED HS IN AUTO, TEMP Switch read to Start Room Cooler Fan on High Temp.
#54-2-15 -030-0194A -A 2-TS -030-0194A -A PENETRATION ROOM COOLER FAN 201TA3125JJTTX5	737° 409 73XJ9-333371	A 1000	L	REQ'L FOR AUTO START OF UNIT 2 ROOM COOLER WHICH SERVES ABGTS TRAIN B.
PAGE	· • •			3 R
$\frac{1}{\omega}$	PREPARERIDATE	BDM	8/1	2/86 4.4.84
	CHECKED/DATE	AWL	8/1	6/86 KEL

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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EGIS NUNBER UNIT DEVICE ID		LOCATION SLEY(1) RM(PAD CONIRAGI	<u>CA</u> I (2)	Q2ER_TIME	EXENI	SAEEIY_EUNCIION
WSN-1-TS -030-01948 -A 1-TS -030-019 PENETRATION ROOM COOLER FAN	48 -A 201TAB125JJTTX6	737° A05 85kj2-336755	A A A A	1000 1N0 1N0 1N0 1N0 1M0	L RH/A CV/A AF AB	IF ASSOCIATED HS IN STANDBY, TEMP SWITCH IS REQUIRED TO CLOSE ON ROOM HIGH TEMP.
WBH-2-TS -030-01948 -A 2-TS -030-019 PENETRATION ROOM COOLER FAN	48 -4 2017A9125JJTTX5	737* A09 85KJ2-236735	A	1000	L	REQOD FOR AUTO START OF UNIT 2 ROOM COOLER WHICH SERVES ABGTS TRAIN B.
WBN-1-TS -030-0195A -B 1-TS -030-019 Penetration Room Cooler Fah	5A -3 201tab125jjttx6	737' AO5 83xJ9-333871	A A A A	1060 1M0 140 140 140 140	L RH/A CV/A Af Ab	IF ASSOCIATED HS IN AUTO, TEMP Switch read to start room Cooler fan on high temp.
W&N-2-TS -030-0195A -5 2-TS -030-019 Penetration room cooler fan	5A -B 201TA3125JJTTX5	737° 409 83xj9-833871	A	1900	L	REQ'D FOR AUTO START OF UNIT 2 Room cooler which serves abgts Train 8.
WON-1-TS -030-01958 -3 1-TS -030-019 PENETRATION ROOM COOLER FAN	58 -8 201tan125jjttxo	7374 AO5 35 KJ2-336755	A A A A A	1000 130 140 140 140 140	L RH/A CV/A AF AB	IF ASSOCIATED HS IN STANDBY/ TEMP SWITCH IS REQUIRED TO CLOSE ON ROOM HIGH TEMP.
<i>H</i> - <i>H</i>		PREPARER/DATE CHECKED/DATE_	BDM AWI	1 	8/12 8/16	186 KBU 4.86 KBU 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.89 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99 4.99





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#### WATTS BAR NUCLEAR PLAN TABA-EQUIPMENT IDENTIFICATION MATRIX PLANT

-	LOC AT ION	-		
EQIS_NUMBER UNII_DEVICE_ID_NOA DESCRIPTION MODEL_NUMBE	ZMIIH_ ELEV(1) RM/PA B CONIRACI	D CAI QEER_IIN _ (2)	IE EYENI SAEE	IY_EUNCIION
WBN-2-TS -030-01958 -B 2-TS -030-01958 -3 PENETRATION ROOM COOLER FAN 201TA2135JJ	737• A09 JTTX6 &5KJ2-836755	A 1000	L REG Room Trai	D FOR AUTO START OF UNIT 2 Cooler which serves abgts N B.
WBN-1-TS -030-0196A -A 1-TS -030-0196A -A PENETRATION ROOM COOLER FAN 201TA5125JJ	7131 - A06 177,85 - 538,19- 133,371	A 1000 A 1M0 A 1M0 A 1M0 A 1M0 A 1M0	L IFA RH/A REQU CV/A FAN AF AB	SSOCIATED HS IN AUTO, TS IRED TO START ROOM COOLER ON HI TEMP.
WBN-1-TS -C30-01968 -A 1-TS -J30-01948 -A PENETRATION ROOM COOLER FAN 201TA9125JJ	713' 406 ITTX6 85KJ9-836755	A 1900 A 180 A 180 A 180 A 140 A 180	L IFA RH/A TEMP GV/A CLOS AF AB	SS ^D CIATED HS IN STANDBY, Switch IS required to e on room high temp.
WBN-1-TS -030-0197A -B 1-TS -030-0197A -B PENETRATION ROOM COOLER FAN 201TAB125JJ	713' 406 JTTX6 83XJ9-333871	A 100D A 1M0 A 1M0 A 1M0 A 1M0 A 1M0	L IFA RH/A SWIT CV/A ROOM AF AB	SSOCIATED HS IN AUTO, TEMP CH REQUIRED TOSTART COOLER FAN ON HIGH TEMP.
WBN-1-TS -030-0197B -B 1-TS -030-0197B -2 PENETRATION ROOM COOLER FAN 201TA5123JJ	713' 496 JTTX6 85KJ2-836755	A 1090 A 1M0 A 1M0 A 1M0 A 1M0 A 1M0	L IF A RH/A TEMP CV/A CLOS AF AB	SSOCIATED HS IN STANDBY/ SWITCH IS REQUIRED TO E ON ROOM HIGH TEMP.
GE A-5	PFEPARER/DA	T≞BDM AWL	8/12/86 8/26/86	R_L R R ANCF! 4-4-89

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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

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	EQIS_BUBBEB DESCBICIION	UNII_DEVIC	E_IQ_NQL AZHIIH	LOCATION ELEY(1) CONIBACI.	842240	ča I (2)	OPER_IIME	EXENI	SAEETY_EUNCIION
i i	WBN-2-TS -030-0200A -A Egts Cooler Fan	2-TS -030	- 0200A - A 201 TAB 125 JJT TX 6	757 <b>!</b> 85 kJ2-836	A16 755	Ą	1000	Ļ	EGTS HVAC REQUIRED FOR UNIT 1 Loca Mitigation.
۱ F	WEN-1-TS -030-0201A -A PIPE CHASE COOLERS FAN	1-TS -030	-0201A -A SEE OPEN ITEM 1	692"	AO 3	A A A A A	1000 1H0 1H0 1H0 1H0	L RH/A CV/A AF AB	L: ABI OR ESF SIGNAL WILL AUTO START FANS. RH, CV, AF, AB: AUTO START COOLING FANS ON PIPE CHASE HIGH TEMP.
k P	IBN-1-TS -030-02018 -A PIPE CHASE COOLERS FAN	1-TS -030	-02018 -A 201tab125Jjttx6	692 <b>•</b> 86 pl b-3673	AO 3 3 1 0	A A A A	1000 1mo 1mo 1mo 1mo	L RH/A CV/A AF AB	IF ASSOCIATED HS IN STANDBY-TS REQD TO CLOSE ON ROOM HIGH TEM
H P	IBN-1-TS -030-0202A -B IPE CHASE COOLERS FAN	1-75 -030	-U202A -B See open item 1	692° y	408	A A A A	1000 1H0 1X0 1H0 1H0	L RH/A CV/A AF AB	L: ABI OR ESF SIGNAL WILL AUTO START FANS. RH, CV, AF, AB: AUTO-STARTCOOLING FANSON PIPE CHASE HIGH TEMP.
	BN-1-TS -030-02028 -B IPE CHASE COOLERS FAN	1-75 -030-	-02028 -8 201 TAB12 5J JT TX6	692" A 85KJ2−8367	AO8 755	4 A A A	1000 1 HO 1 HO 1 HO 1 HO	L RH/A CV/A AF AB	IF ASSOCIATED HS IN STANDBY-TS Reqd to close on room high tem
A-6 R				PFEPARE Checked	R/DATE_	BDM AWL	5/ 6/	30/86 3/86	R_1RR 





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#### AATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

LOC AT I ON									
EQIS_NUMBES Description	LUII.	QEVICE_ID_NO. dod:	AZMIIH_ EL_NUMBER	ELEV(1) CONIRACI	BHZBAD	<u>CA</u> I (2)	QPES_TIME	EVEUI	SAFETY_EUNCTION
WBN-?-TS -030-0207A EGTS COOLER FAN	-8 2-15	-030-0207A 201	-8 TA5125JJTTX5	757• 85kj2-83	A15 5755	A	1600	L [°] .	EGTS HVAC REQ'D FOR UNIT 1 LOC MITIGATION.
W6N-1-TS -074-0043 Rhr Return Lîne Break D	-A 1-TS Etection	-074-0043 SEE	-A Open iten 1	713•	A?3	A	15 min 30 min	RH∕A CV∕A	MUST PROVIDE SIGNAL TO INITIATE MANUAL ISOLATION DURING A LINE BREAK
W3N-1-TS -074-0044 Rhr Return Line Break D	-A 1-TS Etection	-074-0044 SEE	-A Open Iten 1	7131	A 2 8	A A	15mtn 30min	RH/A CV/A	MUST PROVIDE SIGNAL TO INITIATE MANUAL ISOLATION DURING A LINE BREAK
WBN-1-TS -074-0045 Rhr Return Line Break D	-B 1-TS Etection	-074-0045 Seē	-B OPEN ITEM 1	713'	A 2 3	A A	15 MIN 30 MIN	RH/A Cv/a	MUST PROVIDE ^S IGNAL TO Initiate manual isolation During a line break
WEN-1-TS -074-0046 RHR RETURN LINE BREAK D	- B 1-TS ZTECTION	-074-0046 See	-b Open Iten 1	713'	828	A A	15min 30min –	RH/A CV/A	MUST PROVIDE SIGNAL TO INITIATE MANUAL ISOLATION DURING A LINE BREAK
PAGE A						RD	м	5/30	R / R R
				PREPA	RER/DATE	AW	L	6/03	2186 KBU 4/23,337
BINDER NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 1 OF 1									
-----------------------------------------------------------									
BINDER TITLE_STATIC-O-RING COMPUTED /R1 wer DATE 4-4-85									
<u>TEMPERATURE SWITCHES</u> CHECKED /R1 KBJ DATE 4/24/69									

## TAB A

## NOTES

1. Elevations shown are <u>Actual</u> elevations for equipment located in the Reactor Building and <u>Floor</u> elevations for equipment located outside the Reactor Building. Actual elevations for all equipment are documented in TAB F.

2. See Page B-1 for source of Category and Operating Time assignments.

## PAGE A-8 R1

BINDER NO. WB	NEQ-ITS-002 PLANT WB	<u>N</u> UNIT(S) <u>1</u>	SHEET _1 OF RR
BINDER TITLE	STATIC O-RING	_ COMPUTED DATE	5.22 86
TEMPERATURE	SWITCHES	CHECKED ANL DATE	6/3/8/
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TAB B -	Checklist for evaluati including summary and	on of environmental qualif conclusion	ication

PAGE B-1

TVA 19537 (OE-3-86)

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EMPI	ERATURE SWITCHES	CHECKED THE DA	re <i>q/<u>25</u>/<u>8</u>2</i>
A.	DOCUMENTATION		
•	Equipment Description	Temperature Switches	
	Vendor/Manufacturer	Static O-Ring	
	Equipment Model No.(s)	201TA-B125-JJTTX6	
	•	201TA-B123-JJTTX7	
	QUALIFICATION REPORTS		
	(1) Title/Number/Revis	ion See below	RIMS
			DATE
	(2) Title/Number/Revis:	ion	RIMS
			DATE
	(3) Title/Number/Revis:	ion	RIMS
		· · · · · · · · · · · · · · · · · · ·	DATE
	OTHER (ANALYSIS, VENDOR	DATA, ETC.)	
	(1)AETC "Generic Qualif	ication of Class 1E Electrical	L Equipment Used
	for Nuclear Power Ge	nerating Stations", Report No.	70 % 1000 101)
	Rev. 1, Date 2-28-83	, (RIMS: EEB 840612 500 and F	1E Electrical
	(2) AETC "Qualification"	Testing and Analysis of Class	TE Electrical
	Lquipment in Accorda	No. 184/1-83N Por 1 Date 9-	-17-83 RTMS.
	1/344-82N-D, Report	NO. 16441-65N, Rev. 1, Date 6-	-17-65, KIN5.
		instion of Class 1P Plastrics	Fauinment Used
	(3)AETC "Generic Qualir	ication of Class IE Electrica.	r Equipment Osed

PAGEB-2

DINDER	NO. WBNEO-ITS-002 PLANT WBN UNIT(S) 1 SHEET 2 0	F <u>60</u>
BINDER	TITLE STATIC-O-RING COMPUTED BDM DATE 8/09/86 AUCT	
TEMPE	CRATURE SWITCHES CHECKED AWL DATE 8/26/86	
A. <u>DOC</u>	UMENTATION	
UIN	ER (ANALISIS, VENDOR DATA, ETC.) (Continued)	
<b>(4)</b>	AETC "Qualification Testing of Class 1E Electrical Equipment in Accordance with IEEE Standard 323-1974", Report No. 18577-83N, Rev. 1, Dated 7-18-83, RIMS: B43 851223 510.	
(5)	AETC "Qualification Testing of Class 1E Electrical Equipment in Accordance with IEEE Standard 323-1974", Report No. 18878-84N-2, Rev. 1, Date 8-30-84, RIMS: EEB 850122 301.	
(6)	Aux. Boiler Category and Operating Times WBNOSG4-006 Rev. 4 (B45 851031 226).	
· (7)	Containment HVAC Category and Operating Times WBNOSG4-008 Rev. 15 (B26 900309 231).	
(8)	RHR Category and Operating Times WBNOSG4-020 Rev. 8 (B26 900309 232). من الملكم 2 من المالية من الملكة المكلم الم	R4
(9)	Unit 2 Components Required for Unit 1 Operation Category and Operating Times WBNOSG4-040 Rev. 7 (B26 900327 203).	
(10)	Calculation WBNTSR-014 R0 (B26 890725-551).	
(11)	DCA-P02351-17-0	
(12)	NTS "Report of Test for SLB Testing of SOR Model 12TA-B4-NX-C1A-JJX6 Pressure Switch" Report No. 21510-86N, Revision 0, dated January 14, 1986.	R4
(13)	Deleted	
(14)	Material Aging Calculation (WAC-92).	
(15)	System 30 Demonstrated Accuracies (B43 851029 926).	
(16)	System 12 Demonstrated Accuracies (B43 851121 915).	
(17)	HVAC and RHR Demonstrated Accuracies (see Open Item No. 1).	
(18)	HVAC Set-point Evaluation (B45 860317 236).	
(19)	Aux. Boiler Set-point Evaluation (B45 860530 219) (see Open Item No. 2)	
(20)	HVAC and RHR Set-point Evaluation (see Open Item No. 1)	
	BINDER  A. <u>DOC</u> OTH (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (12) (13) (14) (15) (16) (17) (18) (19) (20)	<ul> <li>MANDA NO. MANDELID-DUZ FLANT WEB UNIT(S) 1 SHEET 2 0 BINDER INTLE STATIC-O-RING COMPUTED BDM DATE \$/09/36 4007 TEMPERATURE SWITCHES CHECKED AWL DATE \$/26/36 4007 TEMPERATURE SWITCHES CHECKED AWL DATE \$/26/36 4007 420/70</li> <li>A. DOCUMENTATION OTHER (ANALYSIS, VENDOR DATA, ETC.) (Continued)</li> <li>(4) ARTC "Qualification Testing of Class LE Electrical Equipment in Accordance with IEEE Standard 323-1974", Report No. 18577-83N, Rev. 1, Dated 7-18-83, RIMS: B43 851223 510.</li> <li>(5) AETC "Qualification Testing of Class LE Electrical Equipment in Accordance with IEEE Standard 323-1974", Report No. 18878-84N-2, Rev. 1, Date 8-30-84, RIMS: EEE 850122 301.</li> <li>(6) Aux. Boiler Category and Operating Times WENOSG4-006 Rev. 4 (B45 851031 226).</li> <li>(7) Containment HVAC Category and Operating Times WENOSG4-008 Rev. 15 (B26 900309 231).</li> <li>(8) RHE Category and Operating Times WENOSG4-008 Rev. 15 (B26 900309 231).</li> <li>(9) Unit 2 Components Required for Unit 1 Operation Category and Operating Times WENOSG4-040 Rev. 7 (B26 900327 203).</li> <li>(10) Calculation WENTSR-014 RO (B26 890725-551).</li> <li>(11) DCA-P02351-17-0</li> <li>(12) MTS "Report of Test for SLE Testing of SOR Model 127A-B4-NX-CIA-JIX6 Pressure Switch" Report No. 21510-86M, Revision 0, dated January 14, 1986.</li> <li>(13) Deleted</li> <li>(14) Material Aging Calculation (WAC-92).</li> <li>(15) System 30 Demonstrated Accuracies (B43 851029 926).</li> <li>(16) System 12 Demonstrated Accuracies (B43 851029 926).</li> <li>(17) HVAC and EHE Demonstrated Accuracies (See Open Item No. 1).</li> <li>(18) HVAC Set-point Evaluation (B45 860317 236).</li> <li>(19) Aux. Boiler Set-point Evaluation (B45 860530 219) (see Open Item No. 2)</li> <li>(20) HVAC and EHE Set-point Evaluation (B45 860530 219)</li> </ul>

	BINDER NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 2A OF 6 R 1 R	0_
	BINDER TITLE STATIC-O-RING COMPUTED BDM DATE 8/19/86	•
)	<u>TEMPERATURE SWITCHES</u> CHECKED <u>AWL</u> DATE <u>8/26/86</u>	
	A. DOCUMENTATION	
	(21) SCR WBNFOP8603/R1 (B71 860509 007).	
	(22) 100 Day LOCA Dose in EGTS WENNAL3-031 Rev. 1 (B45 880826 235).	R1
-	(23) NCRs $6224/RO$ and $6774/RO$ .	
	(24) Deleted	R1
	(25) SOR Letter Addressing Qualified Life (EEB 840802 004).	]
	(26) SOR Confirmation Letter (B71 860521 100).	
	<ul> <li>(27) Environmental Data Drawing 47E235-85 Rev. 1.</li> <li>(28) Environmental Data Drawing 47E235-86 Rev. 1.</li> <li>(29) Environmental Data Drawing 47E235-46 Rev. 1.</li> </ul>	
)	<ul> <li>(30) Environmental Data Drawing 47E235-47 Rev. 2.</li> <li>(31) Environmental Data Drawing 47E235-48 Rev. 3.</li> <li>(32) Environmental Data Drawing 47E235-49 Rev. 2.</li> </ul>	R1
,	<ul> <li>(33) Environmental Data Drawing 47E235-56 Rev. 1.</li> <li>(34) Environmental Data Drawing 47E235-57 Rev. 2.</li> <li>(35) Environmental Data Drawing 47E235-59 Rev. 2.</li> </ul>	
	<ul> <li>(36) Environmental Data Drawing 47E235-60 Rev. 1.</li> <li>(37) Environmental Data Drawing 47E235-78 Rev. 3.</li> <li>(38) Environmental Data Drawing 47E235-61 Rev. 1.</li> </ul>	
	(39) SOR Confirmation Letter Addressing Switch Orientation B71 860610 100	
	Note: All references in this section are to AETC Test Report 17344-82N-C unless otherwise stated.	
	Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the binder. This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.	R1

PAGE B-4 R1

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מאדם	ER NO. <u>WBNEQ-ITS-002</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>3</u> OF R 3 R
BIND	ER TITLE_STATIC-O-RING COMPUTED_BDM DATE 8/27/86 40.97
<u> </u>	MPERATURE SWITCHES CHECKED AWL DATE 8/27/86
<i></i>	/0-17- 87
P	CONCLUSION OF PENIEW (Check only one block)
<b>D</b> .	CONCLUSION OF REVIEW (Check only one block)
	X Equipment Qualified
ñ	Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule
	Equipment Qualification Not Established by Documentation
	Equipment Not Qualified Based on Test Failures
	OPEN ITEMS AND QUALIFICATION DEFICIENCIES
	(1) SCRWBNEOP8603 must be implemented and closed.
	(2) Set-point evaluation outstanding for system 12 switches. The
	demonstrated accuracy and act aciet analystical much he
	revised for system 30 temperature switches.
	(3) Deleted
	(4) Deleted
	(5) Deleted
	•
	COMMENTS/RECOMMENDATIONS None
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<u> </u>	MPERATURI	E SWITCHES		CHECKE	D <u>AWL</u>	DATE <u>67</u>	/ <u>03/8</u> 6 <u>/(E)</u> +/::*/i*	а 
с.	QUALIFI	CATION CRI	<u>FERIA</u>					
	Criteria Followia	a Used to l ng (Indicat	Demonst te Which	rate Qual n Criteri	ification a is Appli	is in Acc .cable):	cordance w:	ith th
	<u> </u>	Components and/or NU	s are Qu REG-0588	ualified 8 Categor	to the Cri y I (IEEE3	teria of 23-1974)	10CFR50.49	9
		Components Category (IEEE323-)	s are Qu II or th 1971)	ualified ne DOR Gu (DOR Guid	to the Cri idelines o elines App	teria of of 1E Bull plicable t	NUREG-0588 Letin No. 7 to only BFN	3 79-01E N)
	JUSTIFI	CATION/COM	IENTS		·			
	<u>,</u>						······	
	INDICATI	E OTHER REC	GULATORY	Y DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER REG 3-1974	GULATOR	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI IEEE 32: IEEE 344	E OTHER REG 3-1974 4-1975	GULATORY	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI IEEE_32. IEEE_344	E OTHER REG 3-1974 4-1975	GULATOR	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER REG 3-1974 4-1975	GULATORY	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER REC 3-1974 4-1975	GULATOR	DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER RE( 3-1974 4-1975	GULATOR	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER REC 3-1974 4-1975	GULATOR	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER REC 3-1974 4-1975	GULATOR:	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER RE( 3-1974 4-1975	GULATOR	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET
	INDICATI	E OTHER REC 3-1974 4-1975	GULATORY	2 DOCUMEN	TS AND/OR	INDUSTRY	STANDARDS	MET

BIND	ER NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 5 OF 60 R R R R R R R R R R R R R R R R R R R
TEMP	ERATURE SWITCHES CHECKED AUL DATE 6/3/66
D.	QUALIFICATION METHODOLOGY (Check only one block)
,	Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
	X Test of Similar Items with Supporting Analysis
	Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
	Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis
	JUSTIFICATION/COMMENTS The Certificates of Conformance (see TAB C,
	Section 16) for these temperature switches list the first four reports
	in Section A as applicable to show generic qualification. Report 17344-
	82N-C is mainly used as a basis for qualification of these switches.
	The fifth report, 18878-84N-2, is used to obtain an activation
	energy for silicone rubber and for thermal aging data on silicone
	rubber.
	Qualification of the temperature switches is accomplished by consid-
	ering separately the two basic subassemblies of the device. The
	temperature switch is composed of the switch (electrical) and the
	sensor (mechanical).
	Examination of catalog information (TAB E) shows that the switch sub-
	assembly is identical to that tested in 17344-82N-C with two excep
	tions - the material used in the secondary diaphragms and the
	attachment at the pressure port.
	PAGE B-7

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BINDI	R TITLE STATIC O-RING COMPUTED BAM DATE S-31-80
TEMP	ERATURE SWITCHES CHECKED AND DATE 6/3/82
	JUSTIFICATION/COMMENTS (Continued)
•	The secondary diaphragms of the plant equipment have grey silicone
	rubber (see TAB C, Section #22 on index): the tested switch has fluor-
	inated silicone on dacron polyester cloth. Several factors allow the
	assumption that the silicone rubber is as good as or better than the
	fluorinated silicone on dacron polvester cloth for this application.
· ,	These are:
	1) The fluorinated silicone and silicone rubber are both members of the
	silicone family of materials. The activation energy, which is an
	indication of thermal stability, is higher for silicone rubber
	<u>(1.59eV - see 18878-84N-2, Section 3.0) than it is for fluorinated</u>
	silicone (1.2eV - see 17344-82N-C, Appendix D) or for dacron
	polyester_cloth (1.18eV - see 17344-82N-C, Appendix D). Therefore.
	the silicone rubber is less susceptible to the long-term effects of
	time and temperature.
	2)Silicone rubber has been thermally aged for 131 hours at 280°F
	(see 18878-84N-2, Appendix E). This represents a life of 725 years
	at the normal and abnormal service temperatures (see calculation
	WAC-92 in TAB C). Therefore, silicone rubber is not sensitive
	to thermal aging at these temperatures.
	·

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TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-ITS-002	PLANT WBN	UNIT(S) <u>1</u>	SHEET 7 OF 60
BINDER TITLE STATIC O-RI		D <u>Ben</u> DATE	<u>5-319</u> ,
TEMPERATURE SWITCHES	CHECKED	HAL DATE	6/3/86

JUSTIFICATION/COMMENTS (Continued)

simulation (See 18878-84N-2, Section 7.5.2). This temperature very adequately envelops the maximum accident temperature (219°F) for the areas in which these switches are located. Therefore, silicone rubber is not sensitive to accident temperatures for this application. 4) Radiation testing has been done on the silicone rubber to a dose of 3.3x10⁷rads (see 18441-83N, Section 5.1.B). Therefore, silicone rubber is not significantly affected by radiation doses of least 3.3x10⁷rads.

In conclusion, the silicone rubber can perform as well as or better than the fluorinated silicone in the plant applications.

The attachment at the pressure port of a pressure switch is a pressure port fitting: in a temperature switch it is a temperature bulb (see Sales Manuals in TAB E). In this binder, the temperature bulb is considered as a separate subassembly in the qualification of the temperature switch.

Therefore, the testing performed on the pressure switch in 17344-82N-C is representative of the environment in which the switch subassemblies are located in the plant providing that radiation exposure for a 40year life plus DBE accident is limited to 3.3x10⁷ rads.

BINDER NO. WBNEQ-ITS-002	PLANT WBN	UNIT(S)	SHEET <u>8</u> OF <u>60</u>
BINDER TITLESTATIC O-RI	NG COMP	UTEDBAM_ DATE	R R
TEMPERATURE SWITCHES	CHEC	KED ANL DATE	4/3/86

JUSTIFICATION/COMMENTS (Continued)

The sensor subassembly is a purely mechanical device consisting of a T316 stainless steel tube filled with Dupont "Freon-12" charge material (see 18441-83N, pg 5-6). Being such, this device is not required to be qualified to IEEE 323-1974. It will, however, be evaluated to demonstrate that it would not be affected by the accident environments to which it could be exposed.

The stainless steel is not sensitive to the temperature and radiation levels being considered in this binder.

"Freon-12" is not susceptible to thermal aging at the temperatures being considered as evidenced by the thermal decomposition data in 18441-83N, Appendix E. It shows a decomposition rate of 1% per year at at temperatures greater than 900°F. Irradiation testing performed on the temperature switch in 18441-83N, Section 5.1.B, shows that "Freon-12" is not significantly affected by doses to at least 3.3x10⁷ rads.

Therefore, based on the data presented above and on sound engineering rationale, the mechanical temperature bulb assembly could withstand the harsh environments under consideration in this binder.

PAGEB-10

TE	MPERA	TURE SWITCHES	CHECKED	AWL DATE 6/	04/86 <u>KA)</u> 4/23/67			
Ε.	EQUI Is t iden (Yes	PMENT DESCRIPTION he equipment iden tical to the plan /No/NA)? <u>No</u>	tified in the o t equipment what	qualification doc ich requires qual	umentation ification			
	·		<u>Plant Device</u> Temperature	Qualification Document	Reference			
	(1)	Equipment Type	<u>Switch</u> Static	<u>See (1) below</u> Static	Sect. 3.0			
	(2) (3)	Manufacturer Model Number(s)	<u>O-Ring</u> 201TA-B125- JJTTX6	<u>O-Ring</u> 12TA-B4-NX- <u>C1A-JJTTX6</u>	<u>pg 3-1</u> Add. I, Sect. 3.0 pg 3-2			
			201TA-B123- JJTTX7	201TA-B125 -JJ (See (2) below)	Add. I, Sect. 3.0 pg 3-1			
	(4)	Serial Number(s)	See Sheet 10	<u>82-6-384</u> <u>83-4-3530</u>	Sect. 3.0 pg 3-1 18441-83N, Sec 3.0 pg 3-2			
	(5)	Identify Componen Unique checkshee attached:	nt- <u>None</u> t					
	JUSTIFICATION/COMMENTS							
	(1) The temperature switch is qualified using tests of pressure switches (17344-82N-C and 18878-84N-2) and a test of a							
		temperature switc	h (18441-83N).	· ·				
	<u>(2)</u>	The differences be	etween the plan	nt model and the	models			
		tested are in the	last section (	of the model numb	ers (i.e.			

PAGE B-11 R1

SINDER NO. WBNEQ-ITS-	002 PLANT WBN	UNIT(S) 1 SHEET	<u>10</u> OF 60
SINDER TITLE STATIC-	O-RING COMPUTED BDM	L DATE <u>8/12/86_WCC</u>	<u>wer</u>
•		4/2	+/89
TEMPERATURE SWITCHE	S CHECKED_AWI	DATE <u>8/25/86_KBR</u>	<u>7404</u>
		·····	2070900
1. From TAB B. Sect	<u>ion E(4)</u> :		
EIN	Serial Numbers	PO Number	
<u></u>			
0-TS-12-94A	85-7-4260	85K1C-837662	
0-TS-12-94B	86-10-2389R	86PLB-376059	F
0-TS-12-97A	85-7-4262	85K1C-837662	•
0-TS-12-97B	85-7-4263	85K1C-837662	• •
0-TS-30-192A	84-9-3733	<b>84KN2-83575</b> 4	•
0-TS-30-192B	85-3-3457	85KJ2-836755	•
0-TS-30-193A	84-9-3734	<b>84KN2-835754</b>	
0-TS-30-193B	85-3-3452	85KJ2-836755	
1-TS-30-194A	84-2-249	83XJ9-833871	
1-TS-30-194B	85-3-3439	85KJ2-836755	
1-TS-30-195A	84-2-250	83XJ9-833871	
1-TS-30-195B	85-3-3440	85KJ2-836755	
1-TS-30-196A	84-2-252	83XJ9-833871	
1-TS-30-196B	85-3-3437	85KJ2-836755	
1-TS-30-197A	84-2-254	83XJ9-833871	
1-TS-30-197B	85-3-3438	85KJ2-836755	
1 00 00 0014			

85-12-269

* 85-3-3444

84-2-248

84-2-251

85-3-3449

85-3-3450

85-3-3451

85-3-3458

*

*

*

86PLB-367310

85KJ2-836755

83XJ9-833871

85KJ2-836755

83XJ9-833871

85KJ2-836755

85KJ2-836755

85KJ2-836755

*

* See Open Item No. 1

1-TS-30-201B

1-TS-30-202A

1-TS-30-202B

2-TS-30-194A

2-TS-30-194B

2-TS-30-195A

2-TS-30-195B

2-TS-30-200A

2-TS-30-207A

1-TS-74-43

1-TS-74-44

1-TS-74-45

1-TS-74-46

PAGE B-12 R3

	BINDER NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 11 OF BINDER TITLE STATIC O-RING COMPLITED BOATE STATE
	TEMPERATURE SWITCHES CHECKED AND DATE 4/3/86
	JUSTIFICATION/COMMENTS (Continued)
	2. From TAB B, Section E(3): (Continued)
	(reference TAB E).
	X6 = Designates the required documentation for a nuclear qualified
	switch (reference SOR letter in TAB C).
	X7 = Designates nuclear qualified switch and also indicates it has
	a smaller temperature bulb.
	response time and a narrower range (40-150 °F).
	125 = Contains standard spring and has a range of 40-225°F.
	Reference: TAB C, SOR Confirmation letter; TAB E, Vendor
	Drawings and Sales manual.
•	· · · · ·
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7	
	DACE B-12

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		יידי ארו ס	R <u>1</u> R <u>4</u>
SINDER TITLE STATIO	<u>C-O-RING</u> COMPUTED_	BDM DAIE	<u>5722780 wcg n</u> <u>7-4-89</u> 6-1
TEMPERATURE SWITC	HES CHECKED	AWL DATE	6/03/86 KBN /
F. INSTALLATION I	NTERFACES		<u>,</u>
List all inter	faces pertinent to EO	identified in	the qualification
documentation	and/or evaluation and	reference the	source. Is the
interface a re	quirement for our appl	lication (Yes/N	No)? (Note below
If yes, enter	requirement in QMDS, 1	ir no, provide	justification.
•	•	Plant	
		Requirement?	Reference
<u>Interface</u>	<u>Identify Interface</u>	<u>(Yes/No)</u>	Test Report
		V. a	Sect. 7.8.1
Mounting Bolts	See (1) below	<u>ies</u>	pages 7-19
External Proce Connections	ss <u>None</u>	NA	NA
			77.4
Electrical	<u>See (4) on page 13</u>	<u>NA</u>	<u>NA</u>
Gonnections			Sect. 7.10.4
Conduit Seals	See (2) below	<u>No</u>	pages 7-37
Connector	·		
Seals	<u>See (4) on page 13</u>	<u>NA</u>	NA
		<b>T</b>	Sect. 7.10.4
Orientation	See (3) page 13	Ies	pages /-5/
Physical		•	
Configuration	None	NA	NA
	See (4) and (5),		
Other	page 13	<u>     Yes                               </u>	See (4) and (3
JUSTIFICATION/	COMMENTS		
(1) 3 Standard	l grade 1/4" U-bolts;	<u>this requireme</u>	nt is also state
in SOR's a	eneral instructions f	or qualified s	witches - SOR
document N	No. 8215-439R1 (refere	nce TAB H, pag	<u>e 1).</u>
(2) The Enviro	onmental Drawings iden	tify areas wit	<u>h high potential</u>
for_conder	isate formation and sp	<u>ecifies condui</u>	t sealing
<u>requiremen</u>	nts (see Section K(6)	of TAB B). Ad	ditionally.
conduit se	eals are required by t	<u>he test report</u>	: however, since

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WBEP-0139Q

BINDER T	TLE_STATIC-O-RINGCOMPUTED_BDMDATE 5/22/86 west
TEMPERA	TURE SWITCHES CHECKED AWL DATE 6/03/86 KEA
From TA	AB B. Section F: (Continued)
	switches, a conduit seal requirement is not necessary for the plant equipment.
(3)	Test report 17344-82N-C mounted the unit with the pressure por vertical axis parallel to earth. The general instruction shee sent with the switches, however, states that the switches should be mounted with the pressure port vertical axis oriented downward. The purpose of testing the switch in the horizontal position was to show that the switch is not position sensitive. (Reference TAB C).
(4)	The test report does not identify a requirement for the inter- face to field wiring: however, connections should be per qualified plant procedures and sealed with Raychem heat-shrink tubing. Refer to Binder WBNEQ-SPLC-001 regarding qualification of the Raychem splice.
(5)	Test report 17344-82N-C tested a pressure switch with a plugged housing which resulted in severe setpoint shifts due to pressure buildup in the housing at high temperatures (LOCA testing). Report 18577-83N is a LOCA test of a second switch with the housing vented. In this test the setpoint shift was acceptable. For plant applications, housing venting require- ments are dependent upon local temperature extremes. Venting is required for components located in environments with maximum accident temperatures greater than their abnormal temperatures. (See TAB G, QMDS).

PLUSEQ/139.30

TEMPERATURE SWITCHES       CHECKED       AMA       DATE 4/3/26         G. TEST SEQUENCE         (1) Test Sequence: Was the test sequence established to simulate the accident environment in accordance with IEEE-323 (74), paragraph 6.3 (yes/no/NA)? (note below)       Yes/No/NA         Reference (1)       Sect. 2.0         (a) Equipment inspected for damage Yes       Page 2-1         (a) Equipment aged:       Sect. 2.0         (b) Baseline performance       Yes         measurements taken       Sect. 2.0         (c) Equipment aged:       Sect. 2.0         Radiation       Yes         year       Yes         (d) Vibration/seismic testing       Sect. 2.0         (e) Design basis event (DBE)       Sect. 2.0         exposure       Yes         gage 2-2       Sect. 2.0         (e) Design basis event (DBE)       Sect. 2.0         (f) Post-DBE exposure       Yes         (g) Final inspection and       **See         (g) Final inspection and       **See         (f) Post-bBE exposure       Yes (Reference *Sec page 1/42)         (g) Final inspection and       **See         (g) Final inspection and       **See         (g) Final inspection and       **See         (g) Final inspection and	BIND	er no. er titi	WBNEQ-ITS-002 PLANT WBN	UNIT(S) ED DATE	SHEET <u>14</u> OF <u>60</u> R R
<ul> <li>G. TEST SEQUENCE <ul> <li>(1) Test Sequence: Was the test sequence established to simulate the accidant environment in accordance with IEEE-323 (74), paragraph 6.3. (yes/no/NA)? (note below) <ul> <li>Yes/No/NA</li> <li>Reference (1)</li> <li>Sect. 2.0</li> <li>(a) Equipment inspected for damage</li> <li>Yes</li> <li>Page 2-1</li> <li>Sect. 2.0</li> <li>(b) Baseline performance</li> <li>Yes</li> <li>Page 2-1</li> <li>measurements taken</li> <li>(c) Equipment aged:</li> <li>Sect. 2.0</li> <li>Page 2-1</li> <li>Measurements taken</li> <li>(c) Equipment aged:</li> <li>Sect. 2.0</li> <li>Radiation</li> <li>Yes</li> <li>Page 2-1</li> <li>Sect. 2.0</li> <li>Wear</li> <li>Yes</li> <li>Page 2-2</li> <li>(d) Vibration/seismic testing</li> <li>conducted</li> <li>Yes</li> <li>Page 2-2</li> <li>(e) Design basis event (DBE)</li> <li>sect. 2.0</li> <li>Sect. 2.0</li> <li>Page 2-2</li> <li>(f) Post-DBE exposure</li> <li>Yes</li> <li>Page 2-2</li> <li>(g) Final inspection and</li> <li>disassembly</li> <li>NO</li> <li>Page 14A</li> </ul> </li> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 14/A)</li> <li>(3) Have the test equipment, test equipment accuracies and calibration do been appropriately documented (yes/no/NA)? Yes</li> <li>(Reference See (3) below ).</li> <li>JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N. Section 5.1.B., page 5-2 and Section 2.0 of 17344-82N-C. page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul></li></ul>	TEMP	ERATU	RE SWITCHES CHECKED	DATE	6/3/86
<ul> <li>(1) Test Sequence: Was the test sequence established to simulate the accident environment in accordance with IEEE-323 (74), paragraph 6.3. (yes/no/NA)? (note below) </li> <li> <ul> <li>Yes/No/NA</li> <li>Reference (1)</li> <li>Sect. 2.0</li> <li>(a) Equipment inspected for damage</li> <li>Yes</li> <li>Page 2-1</li> <li>Sect. 2.0</li> <li>(b) Baseline performance</li> <li>Measurements taken</li> </ul> </li> <li>(c) Equipment aged: <ul> <li>Yes</li> <li>Page 2-1</li> <li>Sect. 2.0</li> <li>Wear</li> <li>Yes</li> <li>Page 2-2</li> <li>(d) Vibration/seismic testing</li> <li>conducted</li> <li>Yes</li> <li>Page 2-2</li> <li>(e) Design basis event (DBE)</li> <li>exposure</li> <li>Yes</li> <li>Page 2-2</li> <li>(g) Final inspection and</li> <li>**See</li> <li>disassembly</li> <li>NO</li> <li>Page 14A</li> </ul> </li> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes</li> <li>(Reference See (3) below ).</li> <li>JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report</li> <li>17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.3.</li> <li>Page 5-2 and Section 2.0 of 17344-82N-C. Page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-</li> </ul>	G.	TEST	SEQUENCE		
(a) Equipment inspected for damage Yes       page 2-1 Sect. 2.0         (b) Baseline performance       Yes       page 2-1 Sect. 2.0         (c) Equipment aged:       Sect. 2.0         Thermal       Yes       page 2-1 Sect. 2.0         (c) Equipment aged:       Sect. 2.0         Radiation       Yes       page 2-1 Sect. 2.0         Wear       Yes       page 2-1 Sect. 2.0         (d) Vibration/seismic testing conducted       Yes       page 2-2 Sect. 2.0         (e) Design basis event (DBE)       Sect. 2.0         exposure       Yes       page 2-2 Sect. 2.0         (f) Fost-DBE exposure       Yes       page 2-2 Sect. 2.0         (g) Final inspection and disassembly       NO       page 14A         (2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference Sec (3) below ).       JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report         17344-62N-C unless otherwise stated.       (2)18441-83N, Section 5.1.B.       page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.         (3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.       Section 2.0 of 17344-82N-C and Appendix F of Addendum I to 17344-		(1)	Test Sequence: Was the test sequer accident environment in accordance (yes/no/NA)? (note below)	nce established with IEEE-323 ( <u>Yes/No/NA</u>	to simulate the 74), paragraph 6.3.2 <u>Reference (1)</u>
<ul> <li>(b) Baseline performance <u>reasurements taken</u></li> <li>(c) Equipment aged: <u>Sect. 2.0</u></li> <li>Radiation <u>Yes</u> <u>Page 2-1</u></li> <li>See (2)</li> <li>Radiation <u>Yes</u> <u>Page 2-1</u></li> <li>See (2)</li> <li>Radiation <u>Yes</u> <u>Page 2-1</u></li> <li>(d) Vibration/seismic testing <u>Sect. 2.0</u></li> <li>(e) Design basis event (DBE) <u>Sect. 2.0</u></li> <li>(f) Post-DBE exposure <u>Yes</u> <u>Page 2-2</u></li> <li>(g) Final inspection and <u>**See</u> <u>disassembly</u> <u>NO</u> <u>Page 14A</u></li> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? <u>Yes</u> (Reference <u>*See page 144</u></li> <li>(3) Have the test equipment, test equipment accuracies and calibration date the set sequence <u>See (3) below</u> ).</li> <li>JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report <u>17344-82N-C unless otherwise stated.</u> (2)18441-83N, Section 5.1.B. <u>Page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</u></li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul>			(a) Equipment inspected for damag	e <u>Yes</u>	Sect. 2.0 $\underline{\text{page } 2-1}$ Sect. 2.0
<ul> <li>(c) Equipment aged: Thermal Yes page 2-1 See (2) Radiation Yes below Wear Yes page 2-1 (d) Vibration/seismic testing Sect. 2.0 Wear Yes page 2-1 (e) Design basis event (DBE) Sect. 2.0 exposure Yes page 2-2 (e) Design basis event (DBE) Sect. 2.0 (f) Post-DBE exposure Yes page 2-2 (g) Final inspection and **See disassembly NO page 14A (2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 14A (3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Beference See (3) below ). JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.3. page 5-2 and Section 2.0 of 17344-82N-C, page 2-2. (3)Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.</li> </ul>			(b) Baseline performance measurements taken	Yes	page 2-1
Thermal       Yes       page 2-1         Radiation       Yes       below         Sect. 2.0       Wear       Yes         (d) Vibration/seismic testing conducted       Yes       page 2-1         (d) Vibration/seismic testing conducted       Sect. 2.0         (e) Design basis event (DBE) exposure       Sect. 2.0         (f) Post-DBE exposure       Yes         (g) Final inspection and disassembly       NO         (l) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 144)         (3) Have the test equipment, test equipment accuracies and calibration day been appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).         JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report         17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.         (3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.			(c) Equipment aged:		Sect. 2.0
Radiation       Yes       below         Wear       Yes       Dage 2-1         (d) Vibration/seismic testing conducted       Sect. 2.0         (e) Design basis event (DBE) exposure       Sect. 2.0         (e) Design basis event (DBE) exposure       Sect. 2.0         (f) Post-DBE exposure       Yes         (g) Final inspection and disassembly       NO         (2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 14A)         (3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).         JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.         (3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.			Thermal	Yes	<u>page 2-1</u> See (2)
Wear       Yes       Page 2-1         (d) Vibration/seismic testing conducted       Sect. 2.0         (e) Design basis event (DBE) exposure       Sect. 2.0         (e) Design basis event (DBE) exposure       Sect. 2.0         (f) Post-DBE exposure       Yes         (g) Final inspection and disassembly       NO         (2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 144)         (3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).         JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report         17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.         (3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.			Radiation	Yes	below Sect. 2.0
<ul> <li>(d) Vibration/seismic testing</li></ul>			Wear	Yes	page_2-1
<ul> <li>(e) Design basis event (DBE) Sect. 2.0</li> <li>exposure Yes page 2-2 Sect. 2.0</li> <li>(f) Post-DBE exposure Yes page 2-2</li> <li>(g) Final inspection and **See disassembly NO page 14A</li> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 14/2)</li> <li>(3) Have the test equipment, test equipment accuracies and calibration debeen appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).</li> <li>JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul>			(d) Vibration/seismic testing conducted	Yes	page_2-2
<ul> <li>(f) Post-DBE exposure Yes page 2-2</li> <li>(g) Final inspection and **See page 14A</li> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 14/4)</li> <li>(3) Have the test equipment, test equipment accuracies and calibration date been appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).</li> <li>JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.8, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul>			(e) Design basis event (DBE) exposure	Yes	Sect. 2.0 page $2-2$ Sect. 2.0
<ul> <li>(g) Final inspection and **See <u>page 14A</u></li> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? <u>Yes</u> (Reference <u>*See page 144</u></li> <li>(3) Have the test equipment, test equipment accuracies and calibration date been appropriately documented (yes/no/NA)? <u>Yes</u> (Reference <u>See (3) below</u>).</li> <li>JUSTIFICATION/COMMENTS (1) References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul>			(f) Post-DBE exposure	Yes	page 2-2
<ul> <li>(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes (Reference *See page 14.4)</li> <li>(3) Have the test equipment, test equipment accuracies and calibration day been appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).</li> <li>JUSTIFICATION/COMMENTS (1)References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul>			(g) Final inspection and disassembly	NO	**See page_14A
<ul> <li>(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference See (3) below ).</li> <li>JUSTIFICATION/COMMENTS (1) References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</li> <li>(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-82N-D.</li> </ul>		(2)	Was the same piece of equipment us described in item (1) above (yes/n	ed throughout th o/NA)? <u>Ye</u> s (Refe	ne test sequence erence <u>*See page 14A</u> ).
JUSTIFICATION/COMMENTS (1) References refer to AETC Test Report 17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B, page 5-2 and Section 2.0 of 17344-82N-C, page 2-2. (3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.		(3)	Have the test equipment, test equi been appropriately documented (yes (Reference <u>See (3) below</u> ).	pment accuracies /no/NA)? <u>Yes</u>	and calibration data
<u>17344-82N-C unless otherwise stated. (2)18441-83N, Section 5.1.B,</u> <u>page 5-2 and Section 2.0 of 17344-82N-C, page 2-2.</u> (3)Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344- 82N-D.		JUST	TIFICATION/COMMENTS (1)References r	efer to AETC Tes	st Report
page 5-2 and Section 2.0 of 17344-82N-C, page 2-2. (3)Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-		<u>1734</u>	4-82N-C unless otherwise stated. (	<u>2)18441-83N, Sec</u>	tion 5.1.B,
(3) Appendix E of 17344-82N-C and Appendix F of Addendum I to 17344-		page	<u>2 5-2 and Section 2.0 of 17344-82N-C</u>	, page 2-2.	<u></u>
82 N-D.		<u>(3)</u> A	Appendix E of 17344-82N-C and Append	ix F of Addendum	<u>n I to 17344-</u>
	,	<u>82 N-</u>	<u>-D.</u>		<u></u>

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BINDER NO. WBNEQ-ITS-002 PLANT	WBN	UNIT(S)	1	SHEET OF60
BINDER TITLE STATIC 0-RING	_ COMPUT	ED	_ DATE 5-31-	<u>пп</u> 36
TEMPERATURE SWITCHES	CHECKE	DANR	DATE 6/3	186

*During the accelerated aging, SOR replaced the "N6" switch housing with a "TA" type (See 17344-82N, Section 7.2.3, page 7-42). The epoxy lead wire seal, with cover gasket and silicone thread sealant also were replaced: however, a supplemental thermal aging was conducted to compensate. The remainder of the test sequence was completed with the same device.

**Final disassembly and inspection of the test device was not performed: however, a post-accident visual inspection was performed.

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BIND		WBNEQ-ITS-002 PLANT WBN UNIT(S)	1 SHEET <u>15</u> OF R R DATE <u>6.24-86</u>		
<u> </u>	ELAIU	CHECKED KICK	_ DATE <u>9~7105</u>		
н.	AGIN	G			
•	<ul> <li>(1) Was aging considered in the qualification program</li> <li>(Yes/no/NA)? Yes (Reference See Comments).</li> </ul>				
		JUSTIFICATION/COMMENTS Sections 7.2, page 7	7-6; 7.3, page 7-13;		
		7.5, page 7-16; 7.8.5, page 7-25; and 5.1.B	18441-83N, page 5-2.		
	(2)	Were the following effects considered in the	e aging program:		
		Aging Effect	Yes/No/NA Reference		
		Thermal aging	Yes page 7-6 See (1)		
		Radiation exposure	Yes below Sect. 7.85		
		Vibration (non-seismic) aging	Yes page 7-25 Sect. 7.3		
		Operational (electrical/mechanical/process) stress aging	Yes page 7-13		
		JUSTIFICATION/COMMENTS (1)Section 7.5, page	e 7-16 and Section 5.1.B		
		of 18441-83N.			
	(3)	Were all known synergistic effects which are significant effect on equipment performance program (yes/no/NA)? <u>Yes</u> (Reference <u>See Com</u>	e believed to have a considered in the aging mments ).		
		JUSTIFICATION/COMMENTS No synergistic effect	ts are known for the		
		material contained within this device in its	s specific configuration		
·	•	(O-Ring). Any unknown synergistic effects w	will be compensated		
		for by the large margin in testing (Section	7.7, pages 7-17 and 18).		
	(4)	Thermal Aging:			
		(a) Was thermal aging considered in the qua (yes/no/NA)? Yes (Reference Section 7.	alification program .2, page 7-6 ).		
		JUSTIFICATION/COMMENTS None			
		$\mathbf{R}$ in			

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BINDER TITLE _ST	ATIC 0-RING COMPUTED BOM DATE 6-24-86
TEMPERATURE SU	DITCHES CHECKED $H \mathcal{R}^2$ DATE $\frac{2}{2} \frac{4}{8}$
H. (4) Therma	1 Aging: (Continued)
(b)	Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference: <u>See Comments</u> ).
	JUSTIFICATION/COMMENTS 17344-82N-C, Appendix D, 18878-84N-2,
	Section 3.0, and 18441-83N, Appendix E.
(c)	Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference See Comments ).
	JUSTIFICATION/COMMENTS Appendix F, Section 9.1, page 41.
(d)	Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Section 7.2.3, page 7-11).
	Parameter Plant Maximum Normal Test Equivalent
	Temperature (°F) *111.06         302         111           Time         40 Years         100 Hrs         1004.75 Years
	JUSTIFICATION/COMMENTS <u>*Plant maximum normal includes 1% of</u>
	40-year plant life at maximum abnormal temperature.
	See TAB C for equivalent life calculation.
(e)	Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Section 5.2, page 5-2 ).
	JUSTIFICATION/COMMENTS
(f)	If activation energies were used for determining accelerated aging parameters, are they properly referenced to the source of the technical data (yes/no/NA)? Yes (Reference See Comment)
	JUSTIFICATION/COMMENTS 17344-82N-C, Appendix D, 18878-84N-2,
	Section 3.0, and 18441-83N, Appendix E. (See page 17 for

PAGE <u>B-19</u>

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BINDER M BINDER T TEMPER	WBNEQ-ITS-002       WBN       1       17       6         NO.       PLANT       UNIT(S)       SHEET       OF         STATIC O-RING       R       R       R       R         COMPUTED       BAM       DATE $\mathcal{L} = 13 - \mathcal{E} \mathcal{L}$ Image: Computed c
H. (4)	Thermal Aging, Section (f): (Continued)
÷	However, the actual Arrhenius calculations are found in Section
	7.3, pages 7-9 and 7-11. Originally, the weak-link material in the
	switches was thought to be nitrile rubber with an activation energy
	of 1.04eV. Thus, an aging time of 277.7 hours was determined
	(Section 7.2.1, page 7-9). Subsequent to the aging process, data
	was provided to show that nitrile rubber was not present in the
	switch. Thus, based on data in Appendix D, the actual weak-link
	material was a dacron polyester cloth with an activation energy of
	1.18eV. Prior to irradiation, SOR replaced the N6 housing with a
	TA housing which involved replacement of some previously aged
	components (Section 7.2.3, page 7-11). Therefore, a supplemental
	thermal aging was done to retain the aged status of the test unit.
	The plant devices, however, do not have dacron polyester cloth.
د	Instead, they have grey silicone rubber (see TAB C, Section 22)
	which has an activation energy of 1.59 eV (18878-84N-2, Section 3.0).
	That then makes the weak-link material for the switch to be the
	Emmerson and Cummings 2651 Epoxy Potting Compound with an activa-
	tion energy of 1.24 eV. The Arrhenius calculations for the supple-
	mental aging are found in 17344-82N-C, pages 7-11 and 7-13 and
	calculate the qualified life for switches with the dacron polyester
	cloth. The qualified life for the plant devices is determined by
	calculations found in TAB C, Section 9.

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BINDER NO	PLANTATIC 0-RING	UNIT(S)	SHEET OF
BINDER TITLE TEMPERATURE SW	ITCHES	COMPUTED <u>DBM</u> DAT CHECKEDQ <u>UE 21-3</u> DAT	TE <u>6-13-86</u>
H. (4) <u>Therma</u>	1 Aging: (Continued)		
(g)	lf a regression line parameters, are test line (yes/no/NA)? <u>NA</u>	were used for determin points or failure mode (Reference <u>NA</u> ).	ning accelerated aging as identified on the
	JUSTIFICATION/COMMENT	CS <u>None</u>	
(h)	Was the equipment ope (yes/no/NA)? <u>No</u> (Ref	erated during the thern erence <u>Section 7.2.2,</u>	nal aging page 7-10 ).
	JUSTIFICATION/COMMENT	TS <u>Only contact resist</u>	ance measurements
	were taken during the	ermal aging.	
(5) Radi	ation Aging Exposure:		
(a)	Was radiaton aging ex program (yes/no/NA)?	posure considered in t <u>Yes</u> (Reference <u>Sectio</u>	the qualification on 7.5, page 7-16 ).
	JUSTIFICATION/COMMENT	S <u>See (1) page 19.</u>	
(b)	Were the materials su identified in the qua Section 7.7, page 7-1	sceptible to radiation lification program (ye 7 and 18441-83N, Secti	a degradation es/no/NA)? <u>No</u> (Referen on 5.1.B).
	JUSTIFICATION/COMMENT	CS <u>See (2) page 19.</u>	
(c)	Was the basis for rad qualification program	liation aging exposure n (yes/no/NA)? <u>No</u> (Refe	identified in the erence <u>See Comments</u> ).
	JUSTIFICATION/COMMENT	S <u>See (2) page 19.</u>	

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BINDE	R TITLE STATIC O-RING COMPUTED BUN DATE 5-22-36
TEMPEI	RATURE SWITCHES CHECKED AWE DATE 4/3/86
	(1) From TAB B, Section H(5)(a): (Continued)
e.	Radiation withstand capability of the switch part of the device is
	proven in Section 7.5 of 17344-82N-C, where the device is exposed
	2.2x10 ⁸ rads and then successfully completes the seismic and LOCA
	portions of the test. However, withstand capability of the grey
	silicone rubber in the secondary diaphragm and of the temperature-
	sensing bulb is proven in Addendum I of 17344-82N-D, where it is
	irradiated_to 3.3x10 ⁷ rads
	(2) From TAB B, Sections H(5)(b) and H(5)(c): (Continued)
	A generic level of irradiation was administered in both reports.
	The 2.2x10 ⁸ rads dose was generic for inside containment (see
	The 2.2x10 ⁸ rads dose was generic for inside containment (see 
	The 2.2x10 ⁸ rads dose was generic for inside containment (see 
	The 2.2x10 ⁸ rads dose was generic for inside containment (see 

PAGER-22

TE	MPERATURE	SWITCHES	CHECKED_AWL/RNB	DATE <u>6/13/86</u> <u>*/80</u> 
Н.	AGING (Co	ontinued)	<u> </u>	
	(5) (d)	Is the radiation acceptable (Yes/) See Comments	test exposure d No/NA)? <u>Yes</u>	ose and dose rate (Reference:
		Plant normal amb dose (rd)	ient radiation	$7.5 \times 10^{6} rads (737'P.C)$
		Test exposure do	se (rd)	*2.2x10 rads/3.3x10 rad
		Test exposure do	se rate (rd/hr)	*2.36x10 ⁶ rads/hr
				*2.2x10 ⁵ rads/hr
		Test exposure so (e.g., Co-60 g	urce type amma)	*Cobalt-60 Gamma
		JUSTIFICATION/CO	MMENTS <u>*Section</u> 7344-82N-D.	7.5 of 17344-82N-C.
	(6) Vibr	ation (non-seismi	c) Aging:	•
•	(a)	Were the effects normal and abnorn qualification pro Section 7.8.5, pa	of non-seismic mal operation ad ogram ¹ <u>Yes</u> age 7-25	vibration induced during dressed in the (Reference:)
		JUSTIFICATION/CON	MMENTS None	
	(Ъ)	Was the basis for in the qualifica (Reference: <u>Sec</u>	r vibration agin tion program (Ye ction 7.8.5, pag	g identified and justifi s/No/NA)? <u>Yes</u> e 7-25)
		JUSTIFICATION/CON	MMENTS <u>None</u>	
(	(7) Opera	tional Stress Agin	ng:	•
	(a)	Were the effects of operational stress operation adressed (Yes/No/NA)? <u>Yes</u>	of electrical, mo ses induced durin d in the qualific _ (Reference: )	echanical, and process ng normal and abnormal cation program Section 7.3, page 7-13)
		JUSTIFICATION/COM	MENTS None	

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BINDER J	ITLE STATIC-O-RING COMPUTED BDM DATE 6/03/86
TEMPEF	ATURE SWITCHES CHECKED AWL DATE 6/03/86 KBU 4/2:
	(0, (0, -1))
n. <u>AGI</u>	G (Continued)
(7)	(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference:
	Section 7.3, page 7-13
	JUSTIFICATION/COMMENTS <u>None</u>
(8)	Was the qualified life of the equipment and its basis defined in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>Section 7.2.3, pages 7-11 and 7-13</u>
	Qualified life (Document in QMDS) <u>40 years</u>
	JUSTIFICATION/COMMENTS See note (1) on page 22.
(9)	Were replacement intervals for the equipment or its component defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u>
(9)	Were replacement intervals for the equipment or its component defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u>
(9)	Were replacement intervals for the equipment or its component defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u>
(9)	Were replacement intervals for the equipment or its component. defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u> JUSTIFICATION/COMMENTS <u>The qualification program does not</u>
(9)	Were replacement intervals for the equipment or its components defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u> JUSTIFICATION/COMMENTS <u>The qualification program does not</u> <u>define any replacement intervals for the switch or any of its</u>
(9)	Were replacement intervals for the equipment or its component. defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u> JUSTIFICATION/COMMENTS <u>The qualification program does not</u> <u>define any replacement intervals for the switch or any of its</u> <u>components. SOR. however. does require replacement of the</u>
(9)	Were replacement intervals for the equipment or its component. defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u> JUSTIFICATION/COMMENTS <u>The qualification program does not</u> define any replacement intervals for the switch or any of its components. SOR, however, does require replacement of the cover gasket whenever the cover is removed. (See TAB H -
(9)	Were replacement intervals for the equipment or its component. defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>See Comments</u> JUSTIFICATION/COMMENTS <u>The qualification program does not</u> define any replacement intervals for the switch or any of its components. SOR, however, does require replacement of the cover gasket whenever the cover is removed. (See TAB H - SOR General Instructions 8215-475, Rev. 2, and TAB I -

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BINDER NO. WBNEQ-ITS-002 PLANT	WBN UNIT(S) $1$ SHEET $22$ OF $60$
BINDER TITLE	COMPUTED DATE R
TEMPERATURE SWITCHES	CHECKED AND DATE 9/3/84

From TAB B, Section H(8):

(1) The service temperature of 160°F used in Section 7.2.3 is higher than e maximum normal/abnormal temperatures seen by the switches in their varus locations. The qualified life calculation is based on the worst case "maximum normal temperature" of 111°F and the "maximum abnormal temperature" of 111°F and the "maximum abnormal temperature" of 117°F (see TAB C for calculation). Reference TAB B Section (K) for maximum normal and abnormal temperatures, for respective locations.

BINDER NO. WBNEQ-ITS-002 PLANT_	WBN         UNIT(S)         1         SHEET         23         OF         60           R         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B
BINDER TITLE STATIC 0-RING	COMPUTED DATE
TEMPERATURE SWITCHES	CHECKED and late 673-86

## I. MATERIALS ANALYSIS

Identification of Materials Susceptible to Significant Thermal and/or Radiation Degradation and Aging (Use Section C of EQC Binder for Detailed Materials Analysis)

		Radiation		Activation	
	Material/Property/Function	Threshold	<u>Reference</u>	Energy	Reference
					See (1)
(a)	Viton E60C or Fluorel 2174	<u>Not</u>	Given	<u>1.32eV</u>	below
(1)			<b></b>	·	See (1)
(D)	Nomex Paper	Not	Given	1.00ev	Delow (1)
$\langle a \rangle$	Cilians Dubber	Nat	Cimer	1 50 017	below
(6)	Silicone Rubber	NOL	Given	1.596	$\frac{\text{Derow}}{\text{See}(1)\&(3)}$
$(\mathbf{A})$	Ethylana Propulana Publar	Not	Given	1 2807	helow
(4)	Engreen & Cummings 2651		GIVEN	1.2007	See (1)
(e)	Epoxy Potting Compound	Not	Given	1.24eV	below
(0)	Belden No. 32418. Silicone	Rubber			See (1)
(f)	Glass Braid Impregnated	Not	Given	1.51eV	below
	Rodgers No. 640		· · · · · · · · · · · · · · · · · · ·		See (1)
(g)	Glass Filled Phenolic	Not	Given	1.75eV	below
	······································		· <u></u>		See (1)
(h)	Grey Silicone Rubber	Not	Given	<u>1.59e</u> V	<u>below</u>
					See (1)
(i)	Kapton Polyimide	Not	Given	<u>1.41eV</u>	below
JU	STIFICATION/COMMENTS		<u></u>		
(1	)The materials for the temp	aratura swit	tch woro tak	en from the	comparison
<u>\</u>	The materials for the tempe	statute Swith	ten were tak	en riom ene	comparizoon
	list in Addendum I of 17344	4-82N-D. A	ctivation en	ergies for a	11 materials
	except grey silicone rubber	r were taken	n from 17344	-82N-C, Appe	ndix D. The
	activation energy for gray	silicone m	ther was to	kep from Se	oction 3.0 of
	activation energy for grey	STTLCOUG TO	TARET MOD CO	inch LIOM De	
	18878-84N-2 (TAB D).				
(2	Material function can be for	ound in 1887	/8-84N-2, Se	ection 3.0 (1	'AB D).

(3) A literature search has determined that the only material subject to

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synergistic effects is ethylene propylene rubber used in the O-Ring.

BINDER NO PLANT	<u>WBN</u> UNIT(S) <u>1</u> SHEET <u>23A</u> OF <u>60</u> B B
BINDER TITLE STATIC O-RING	COMPUTED DATE
TEMPERATURE SWITCHES	CHECKED Que / PALO DATE 1-13-8"

I. <u>MATERIALS ANALYSIS</u> (Continued)

The onset of synergistic effects occurs at relatively high dose levels compared to normal service conditions and therefore is not a significant aging concern. Figure 2 of NUREG/CR-2157 shows a relationship between dose rate and dose for an EPR material. Up to about 10 to 20 Mrad there is an insignificant difference in observed property degradation due to the dose rate effect, especially in view of the normal variation in properties experienced by EPRs over this same range. Low service doses should minimize the impact of potential synergisms with respect to aging for this equipment.

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BINDER TI	FLE STATIC O-RING COMPUTED BON DATE 6-3-86
TEMPERA	TURE SWITCHES CHECKED AND DATE 4/3/84
J. <u>EQ</u> <u>SP</u> (1)	JIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE ECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS ) Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure not met (yes/no/NA)? Yes (Reference See page 25). Identify Acceptance Criteria: See page 25.
(2)	) Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verifie before, after, and periodically during the test to judge equipment performance (yes/no/NA)? <u>Yes</u> (Reference <u>See page 25</u> ). Identify baseline and functional testing: <u>See page 25</u> .
•	JUSTIFICATION/COMMENTS None
(3	) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? <u>Ye</u> s (Reference <u>Section 7.10.5, page 7-42</u> ). JUSTIFICATION/COMMENTS <u>None</u>

INDI	ER TITLE DATE 5-22-86
:EMP	ERATURE SWITCHES CHECKED ATE 4/3/82
	From TAB B, Sections J(1) and (2): (Reference 17344-82N-C, Appendix F, Sections 7.0 and 16.0)
••	<u>1. Dielectric Withstand Voltage</u>
	Baseline Criteria: less than 2mA leakage at 1240 VAC
	rms_applied_for_l_minute
	Post-LOCA Criteria: Same
	2. Insulation Resistance
-	Baseline Criteria: Greater than 100 M at 500 VDC applied for 1 minut
	Post-LOCA Criteria: Greater than or equal to 1 M at 500 VDC applied
	for 1 minute
	3. Contact Resistance
	Baseline Criteria: 200 M less than at 1 amp
	Post-LOCA Criteria: Same
	4. Overpressure Test
	Baseline Criteria: No pressure loss at 200 psig
•	Post-LOCA Criteria: Same
	5. Operability
	Baseline Criteria: Must operate within the adjustable range
	Post-LOCA Criteria: Must actuate on increasing and decreasing
	pressure at rated voltage and current. Setpoint
	repeatability was not required due to the
	temperature-influenced shift on the setpoint.

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	MPERA	TURE	SWITCHES	CHECKED <u>AWL</u> DA	ATE <u>6/24/86 AZA 4/23/A</u> ?
J.	<u>EQUI</u> <u>PERF</u> (Con	PMENT ORMAN tinue	<u>ELECTRICAL</u> CE SPECIFICA	CHARACTERISTICS NECESSARY ATIONS CAN BE SATISFIED UNI	TO ENSURE THE DER ACCIDENT CONDITIC
	(4)	Do t oper	the applied 1 ating condit	.oads during baseline test: :ions (Yes/No/NA)? <u>Yes</u>	ing reflect normal (Reference:
		See	below		)
		JUST	IFICATION/CO	MMENTS Only the applied	load during DBE was
		iden	tified - 120	) VAC at 5A (Section 7.10.	5. page 7.42).
	(5)	Iden equi	tify electri pment perfor	cal characteristics necess mance specifications can b	sary to ensure the be satisfied.
		(a)	Parameter	Plant Normal Conditions	Reference
			Voltage	120 VAC	(1)
			Load	NA	
			Frequency	60 ± 0.6 Hz	(1)
			Accuracy	<u>NA</u>	
			Other(s)		
			NA	•	
			JUSTIFICATI	(1) CON/COMMENTS <u>Variations</u>	in voltage, load,
			and frequen	acy are accounted for in th	ne design process
			and will no	t vary from the continuous	operating
			characteris	tics outlined in section 8	3.3.1 of Watts Bar
			Final Safet	v Analysis Report.	

TEMPERA	TURE SWITCHE:	S CHECKED_AWL/RNB DATE	4-12-54 6/13/86 <u>//61/</u> 4/24/64
J. <u>EQUI</u> <u>PERF</u> (Con	PMENT ELECTR ORMANCE SPEC tinued)	ICAL CHARACTERISTICS NECESSARY TO IFICATIONS CAN BE SATISFIED UNDER	ENSURE THE ACCIDENT CONDITI
(b)	Parameter	Specific Accident Conditions	Reference
	Voltage	120 ± 2.4 VAC	(1)
	Load	NA	
	Frequency	$\frac{60 \pm 0.6 \text{ Hz}}{201 \text{ TA} - \text{B} 125 - 1175 + + P 10°F}$	(1)
**	Accuracy	$\frac{2011\text{A}-B125-JJTTx7 \pm 8.00^{\circ}\text{F}}{2011\text{A}-B125-JJTTx7 \pm 8.00^{\circ}\text{F}}$	AB C, B458605302
	Other(s)	NA.	
	vary from th	ne continuous operating characteri	stics outlined i
(c)	vary from th section 8.3. Parameter	ne continuous operating characteri 1 of Watts Bar Final Safety Analy 	<u>stics outlined i</u> sis Report (FSAR 
(c)	vary from th section 8.3. Parameter Voltage	ne continuous operating characteri 1 of Watts Bar Final Safety Analy 	Reference Sect. 7.10.5 page 7-42
(c)	vary from th section 8.3. Parameter Voltage Load	ne continuous operating characteri 1 of Watts Bar Final Safety Analy 	Reference Sect. 7.10.5 page 7-42 Sect. 7.10.5 page 7-42
(c)	vary from th section 8.3. Parameter Voltage Load Frequency	ne continuous operating characteri 1 of Watts Bar Final Safety Analy 	Reference Sect. 7.10.5 page 7-42 Sect. 7.10.5 page 7-42
(c) **	vary from th section 8.3. Parameter Voltage Load Frequency Accuracy	ne continuous operating characteri 1 of Watts Bar Final Safety Analy Demonstrated Conditions 120 VAC 5A NA 201TA-B125-JJTTx6 * 201TA-B123-JJTTx7 ± 7.07°F	Reference Sect. 7.10.5 page 7-42 Sect. 7.10.5 page 7-42 Sect. 7.10.5 page 7-42 * TAB C TAB C, B43 851121 91
(c) **	vary from th section 8.3. Parameter Voltage Load Frequency Accuracy Other(s)	<pre>he continuous operating characteri 1 of Watts Bar Final Safety Analy </pre>	Reference Sect. 7.10.5 page 7-42 Sect. 7.10.5 page 7-42 Sect. 7.10.5 page 7-42 * TAB C TAB C, B43 851121 91
(c) **	vary from th section 8.3. Parameter Voltage Load Frequency Accuracy Other(s) JUSTIFICATIO	<pre>ne continuous operating characteri 1 of Watts Bar Final Safety Analy Demonstrated Conditions</pre>	cess and will no         stics outlined i         sis Report (FSAR
(c) **	<pre>vary from th section 8.3. Parameter Voltage Load Frequency Accuracy Other(s) JUSTIFICATIO See Open Ite</pre>	<pre>ne continuous operating characteri 1 of Watts Bar Final Safety Analy </pre>	Reference         Sect. 7.10.5         page 7-42         Sect. 7.10.5         page 7-42

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BINDER NO	. <u>WBNEQ-ITS-002</u> PLANT	<u>WBN</u> UNI	T(S) <u>1</u> SHEET R <u>1</u> DATE <u>6/03/86</u>	R R
TEMPERA	TURE SWITCHES	CHECKED AWL/RNB	DATE <u>6/03/86</u> <i>F/2</i>	
K. <u>REQU</u> Refe	IRED OPERATING ENVIRONME rence Environmental Drav	<u>INT</u> ving No. <u>47E235</u>	<u>-85, -86 (692' Rm</u>	<u>A29)</u>  R
(1)	Normal Max	(2) Abno	rmal Max	
	(a) Temperature (°F) <u>1</u>	11 (a)	Temperature (°F)	<u>117</u>
	(b) Pressure (psig) A	IM(-) (b)	Pressure (psig)	<u>ATM(-)</u>
	(c) Humidity (%) <u>6</u>	3 (c)	Humidity (%)	<u>70</u>
	(d) Radiation (rd) <u>1</u>	<u>.7x10 g</u> amma(d)	Radiation (rd)	<u>NA</u>  P
(3)	Process Interfaces: <u>N</u>	one		
(4)	State anticipated occu	rrence frequence	y and duration of	abnormal
	conditions: <u>Inese con</u> <u>per excursion and will</u>	occur less tha	un 1% of plant lif	e
(5)	Accident (worst case f parameter including pe	or any combinat ak, duration, a	ion of specified and profile):	accident
	(a) Temperature (°F)	219	Accident type	AB
	(b) Pressure (psig)	0.20	Accident type	<u>AB</u>
	(c) Humidity (%)	100	Accident type	<u>AB</u>
	(d) Radiation (rd)	Less ₄ than <u>1x10_gamma</u>	Accident type	_L I
	(e) Spray Type	<u>NA</u>	Accident type	NA
F .	•			

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BINDER TI	TLE <u>STATIC-O-RING</u> COM	PUTED <u>BDM</u>	DATE <u>8/20/86</u> 7-459
TEMPERA	ATURE SWITCHES CHE	CKED <u>AWL</u>	DATE <u>8/25/86</u> 4/111/197
K. <u>REQI</u>	JIRED OPERATING ENVIRONMENT	(Continue	d)
	Comments (duration/peak/p margin, etc.): <u>Accident</u>	rofile/spra temperature	y composition and pH, and pressure will
	decrease linearly to the	normal maxin	num values at the end o
	24 hours.	<u></u>	
(6)	Is the equipment subject can affect the performanc accident conditions (Yes/ Environmental Data Drawin	to moisture e of the equ No/NA)? <u>No</u> g 47F235-85	or liquid intrusion wh uipment under design ba (Reference: <u>See_</u>
(7)	Subject to submergence (Y pages B-51 and B-52	es/No/NA)?	<u>No</u> (Reference: <u>See</u>
	Identify initiation time	and duration	n of submergence: <u>NA</u>
			· · · · · · · · · · · · · · · · · · ·
(8)	Is the equipment subject the total accident dose ( (Reference: <u>Environmenta</u>	to a beta ra Yes/No/NA)? 1 Data Draw:	adiation contribution t <u>No*</u> ing 47E235-85
	If yes, identify the frac beta dose to be added to	tion of the the total do	unattenuated free fiel ose and justify: <u>NA</u>
	* Location is outside the	reactor bu	ilding, therefore, no
	beta contribution.	, <u></u> ,	
(9)	Special environmental cal	culations (	temp., rad., etc.)
	Type		RIMS No.
· .	See TAB B, Section A	-	See TAB B, Section A
		_	
		_	

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<ul> <li>K. <u>REQUIRED OPERATING ENVIRONMEN</u> Reference Environmental Drawis</li> <li>(1) Normal Max <ul> <li>(a) Temperature (°F) 111</li> <li>(b) Pressure (psig) ATM</li> <li>(c) Humidity (%) 63</li> <li>(d) Radiation (rd) 2.0</li> </ul> </li> <li>(3) Process Interfaces: None <ul> <li>(4) State anticipated occurre conditions: These conditions: These conditions: These conditions is the second is the second</li></ul></li></ul>	4/24/69 I ng No. <u>47E235-85, -86 (692' Rm A30)</u> (2) Abnormal Max (a) Temperature (°F) <u>117</u> (-) (b) Pressure (psig) <u>ATM(-)</u> (c) Humidity (%) <u>70</u> (c) Hu
<ul> <li>(1) Normal Max <ul> <li>(a) Temperature (°F) 111</li> <li>(b) Pressure (psig) ATM</li> <li>(c) Humidity (%) 63</li> <li>(d) Radiation (rd) 2.0</li> </ul> </li> <li>(3) Process Interfaces: None <ul> <li>(4) State anticipated occurre conditions: These condi</li> <li>per excursion and will or per excursion and will or parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul> </li> </ul>	<pre>(2) Abnormal Max(a) Temperature (°F) <u>117</u> (-)(b) Pressure (psig) <u>ATM(-)</u>(c) Humidity (%) <u>70</u> (c) Hu</pre>
<ul> <li>(a) Temperature (°F) <u>111</u></li> <li>(b) Pressure (psig) <u>ATM</u></li> <li>(c) Humidity (%) <u>63</u></li> <li>(d) Radiation (rd) <u>2.0</u></li> <li>(3) Process Interfaces: <u>Non</u></li> <li>(3) Process Interfaces: <u>Non</u></li> <li>(4) State anticipated occurre conditions: <u>These condi</u></li> <li><u>per excursion and will oper excursion and will oper angeter including peak</u></li> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul>	(a) Temperature (°F) <u>117</u> (b) Pressure (psig) <u>ATM(-)</u> (c) Humidity (%) <u>70</u> (c) Humidi
<ul> <li>(b) Pressure (psig) ATM</li> <li>(c) Humidity (%) 63</li> <li>(d) Radiation (rd) 2.0</li> <li>(3) Process Interfaces: Non</li> <li>(3) Process Interfaces: Non</li> <li>(4) State anticipated occurre conditions: These condi</li> <li>per excursion and will or</li> <li>per excursion and will or</li> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul>	(-) (b) Pressure (psig) ATM(-) (c) Humidity (%) 70 6 c10 gamma(d) Radiation (rd) NA ence frequency and duration of abnorm tions could exist for up to 8 hours rour less than 1% of plant life
<ul> <li>(c) Humidity (%) 63</li> <li>(d) Radiation (rd) 2.0</li> <li>(3) Process Interfaces: None</li> <li>(3) Process Interfaces: None</li> <li>(4) State anticipated occurre conditions: These condi</li> <li>per excursion and will or</li> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 219</li> </ul>	(c) Humidity (%) <u>70</u> 6 <u>6</u> <u>6</u> <u>6</u> <u>70</u> <u>70</u> <u>70</u> <u>8</u> <u>8</u> <u>8</u> <u>8</u> <u>9</u> <u>9</u> <u>9</u> <u>9</u> <u>9</u> <u>9</u> <u>9</u> <u>9</u>
<ul> <li>(d) Radiation (rd) <u>2.0</u></li> <li>(3) Process Interfaces: <u>Non</u></li> <li>(4) State anticipated occurre conditions: <u>These condi</u></li> <li><u>per excursion and will or</u></li> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul>	ence frequency and duration of abnorm tions could exist for up to 8 hours
<ul> <li>(3) Process Interfaces: Non-</li> <li>(4) State anticipated occurre conditions: These condi</li> <li>per excursion and will or</li> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul>	ence frequency and duration of abnorm tions could exist for up to 8 hours
<ul> <li>(4) State anticipated occurre conditions: <u>These condi</u></li> <li><u>per excursion and will or</u></li> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul>	ence frequency and duration of abnorm tions could exist for up to 8 hours
<ul> <li>(5) Accident (worst case for parameter including peak</li> <li>(a) Temperature (°F) 21</li> </ul>	<u></u>
(a) Temperature (°F) 21	any combination of specified acciden, duration, and profile):
	Accident type <u>AB</u>
(b) Pressure (psig) <u>0.</u>	20 Accident type <u>AB</u>
(c) Humidity (%) <u>100</u>	) Accident type <u>AB</u>
Le: (d) Radiation (rd) <u>lx</u>	ss ₄ than <u>O gamma</u> Accident type <u>L</u>
(e) Spray Type <u>NA</u>	Accident type NA

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TE	MPERA	TURE SWITCHES CHECKED AWL DATE 8/26/86 Ker
		4/28/64
к.	<u>REQU</u>	IRED OPERATING ENVIRONMENT (Continued)
		Comments (duration/peak/profile/spray composition and pH,
		margin, etc.): Accident temperature and pressure will
		decrease linearly to the normal maximum value at the end of
		24 hours.
	(6)	Is the equipment subject to moisture or liquid intrusion whi can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? <u>No</u> (Reference: <u>See</u> <u>Environmental Data Drawing 37E235-85</u>
	(7)	Subject to submergence (Yes/No/NA)? <u>No</u> (Reference: <u>See</u> pages B-51 and B-52
	·	Identify initiation time and duration of submergence: <u>NA</u>
•		
·	(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>No*</u> (Reference: <u>Environmental Data Drawing 47E235-85</u>
		If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA</u>
		* Location is outside the reactor building, therefore, no
		beta contribution.
	(9)	Special environmental calculations (temp., rad., etc.)
		Type RIMS No.
		See TAB B. Section A See TAB B. Section A

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EQUIRED eference 1) Norm (a) (b) (c) (d) 3) Proc 	OPERATING ENVIRO E Environmental D mal Max Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) cess Interfaces: E anticipated oc ditions: These c	NMENT (2) (2) 104 ATM(-) 80 1.8x10 ³ gamma None currence frequent onditions course	E235-46, -4 Abnormal Ma (a) Temper (b) Pressu (c) Humidi (d) Radiat	ature ature are (ps ity (%) cion (r duration or up t	4/223/2371 (°F) <u>110</u> ig) <u>ATM</u> 90 d) <u>NA</u> n of abn o 8 hour
eference 1) Norm (a) (b) (c) (d) 3) Proc  4) Stat cond	e Environmental D mal Max Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) cess Interfaces: ce anticipated oc litions: <u>These c</u>	(2) (2) <u>104</u> <u>ATM(-)</u> <u>80</u> <u>1.8x10</u> gamma <u>None</u> <u>currence frequentions cou</u>	E235-46, -/ Abnormal Ma (a) Temper (b) Pressu (c) Humidi (d) Radiat uency and d ld exist fo	<pre>ity (737 ity (73</pre>	(°F) <u>110</u> ig) <u>ATM</u> <u>90</u> d) <u>NA</u> n of abn o 8 hour
<ol> <li>Norm         <ul> <li>(a)</li> <li>(b)</li> <li>(c)</li> <li>(d)</li> </ul> </li> <li>3) Proce         <ul> <li></li></ul></li></ol>	nal Max Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) cess Interfaces: ce anticipated oc litions: <u>These c</u>	(2) <u>104</u> <u>ATM(-)</u> <u>80</u> <u>1.8x10 gamma</u> <u>None</u> currence frequentions courses	Abnormal Ma (a) Temper (b) Pressu (c) Humidi (d) Radiat uency and d ld exist fo	ax rature ure (ps ity (%) tion (r uration	(°F) <u>110</u> ig) <u>ATM</u> <u>90</u> d) <u>NA</u> n of abn o 8 hour
<ul> <li>(a)</li> <li>(b)</li> <li>(c)</li> <li>(d)</li> <li>3) Proc</li> <li></li> <li>4) Stat</li> <li>cond</li> </ul>	Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) cess Interfaces: ce anticipated oc ditions: These c	<u>104</u> <u>ATM(-)</u> <u>80</u> <u>1.8x10³gamma</u> <u>None</u> currence frequentitions course	<ul> <li>(a) Temper</li> <li>(b) Pressu</li> <li>(c) Humidi</li> <li>(d) Radiat</li> <li>uency and design for the second s</li></ul>	ature re (ps ity (%) tion (r luration or up t	(°F) <u>110</u> ig) <u>ATM</u> <u>90</u> d) <u>NA</u> n of abn o 8 hour
(b) (c) (d) 3) Proc  4) Stat cond	Pressure (psig) Humidity (%) Radiation (rd) cess Interfaces: ce anticipated oc litions: <u>These c</u>	ATM(-) <u>80</u> <u>1.8x10</u> gamma <u>None</u> currence frequent onditions course	<pre>(b) Pressu (c) Humidi (d) Radiat uency and d ld exist for</pre>	ure (ps ity (%) tion (r uration	ig) <u>ATM</u> <u>90</u> d) <u>NA</u> n of abn o 8 hour
(c) (d) 3) Proc  4) Stat cond	Humidity (%) Radiation (rd) cess Interfaces: ce anticipated oc litions: <u>These c</u>	80 <u>1.8x10</u> gamma <u>None</u> currence frequent onditions cou	(c) Humidi (d) Radiat uency and d ld exist fo	ity (%) ion (r luratio	<u>90</u> d) <u>NA</u> n of abn o 8 hour
(d) 3) Proc  4) Stat cond	Radiation (rd) cess Interfaces: ce anticipated oc litions: <u>These c</u>	<u>1.8x10 g</u> amma <u>None</u> currence frequent	(d) Radiat	luratio	d) <u>NA</u>
<ol> <li>Proc</li> <li></li> <li></li> <li>4) Stat cond</li> </ol>	cess Interfaces: ce anticipated oc litions: <u>These c</u>	None currence frequence frequen	uency and d ld exist fo	luration	n of abn o 8 hour
4) Stat	e anticipated oc litions: <u>These c</u>	currence frequencies onditions cou	uency and d ld exist fo	luratio	n of abn o 8 hour
per	excursion and wi	11 occur less	than 1% of	plant	life.
5) Acci para	dent (worst.case meter including	for any comb: peak, duration	ination of n, and prof	<pre>specif ile):</pre>	ied acci
(a)	Temperature (°F	) <u>128</u>	Accident	: type	<u>RH</u>
(b)	Pressure (psig)	0.03	Accident	type	AF/AB
(c)	Humidity (%)	100	Accident	type	RH/CV/A
(d)	Radiation (rd)	Less ₄ than <u>1x10 gamma</u>	Accident	type	LOCA/HE
(e)	Spray Type	<u>NA</u>	Accident	type	<u>NA</u>
	(c) (d) (e)	(c) Humidity (%) (d) Radiation (rd) (e) Spray Type	<pre>(c) Humidity (%) <u>100</u> Less₄than (d) Radiation (rd) <u>lx10 gamma</u> (e) Spray Type <u>NA</u></pre>	<pre>(c) Humidity (%) <u>100</u> Accident Less4than (d) Radiation (rd) <u>lx10 gamma</u> Accident (e) Spray Type <u>NA</u> Accident</pre>	<ul> <li>(c) Humidity (%) <u>100</u> Accident type</li> <li>(d) Radiation (rd) <u>1x10 gamma</u> Accident type</li> <li>(e) Spray Type <u>NA</u> Accident type</li> </ul>

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BINDER TI	TLE <u>STATIC-O-RING</u> COMPUT	ED_BDM DATE <u>8/19/86</u>	
TEMPERA	TURE SWITCHES CHECKE	$D_{\underline{AWL}} DATE 8/26/86 \times \frac{1}{4/28}$	37
K. <u>REQU</u>	IRED OPERATING ENVIRONMENT (	Continued)	
	Comments (duration/peak/prof margin, etc.): <u>Accident tem</u>	ile/spray composition and pH perature and pressure will	<b>,</b>
	decrease linearly to the nor	mal maximum values at the en	<u>d of</u>
	24 hours.		
(6)	Is the equipment subject to can affect the performance o accident conditions (Yes/No/ Environmental Data Drawing 4	moisture or liquid intrusion f the equipment under design NA)? <u>No</u> (Reference: <u>Se</u> 7E235-46	whic basi )
(7)	Subject to submergence (Yes/ pages B-51 and B-52	No/NA)? <u>No</u> (Reference: )	<u>See</u> )
	Identify initiation time and	duration of submergence: _]	NA
(8)	Is the equipment subject to the total accident dose (Yes (Reference: <u>Environmental D</u>	a beta radiation contribution /No/NA)? <u>No*</u> ata Drawing 47E235-46	)
	If yes, identify the fraction beta dose to be added to the	n of the unattenuated free f total dose and justify:	ield NA
	* Location is outside the re	actor building, therefore no	
	beta contribution.		
(9)	Special environmental calcul	ations (temp., rad., etc.)	
	Type	RIMS No.	
	See TAB B. Section A	See TAB B, Section	<u>4</u>
			<u></u>

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<u> </u>	MPERA	TURE	SWITCHES	_ CHECKED <u>AWL</u>	DATE <u>6/</u>	04/( <u>05/8</u> 6 <u>KF</u> 04/2	)4/89 7: <u>3N ///</u> 28/89 ¥/
<b>K.</b>	<u>REQU</u> Refe	IRED rence	OPERATING ENVIRO Environmental D	NMENT Prawing No. <u>47</u>	<b><u><b>E</b>235–48, –49</u></b>	<u>(737 R</u> m	<u>1 A05)</u>
	(1)	Norm	al Max	(2)	Abnormal Max	:	
		(a)	Temperature (°F)	104	(a) Tempera	ture (°F)	110
		(b)	Pressure (psig)	<u>ATM(-)</u>	(b) Pressur	e (psig)	ATM(-)
		(c)	Humidity (%)	80	(c) Humidit	y (%)	90
		(d)	Radiation (rd)	5 <u>8.8x10</u> gamma	(d) Radiati	on (rd)	NA
	(3)	Proc	ess Interfaces:	None		<u> </u>	
	(4)						
	(4)	Stat cond per	e anticipated oc itions: <u>These c</u> excursion and wi	currence frequ onditions coul 11 occur less	uency and du ld exist for than 1% of	ration of <u>up to 8</u> plant lif	abnorm hours e.
	(4)	Stat cond per Acci para	e anticipated oc itions: <u>These c</u> excursion and wi dent (worst case meter including p	currence frequent onditions could 11 occur less for any combi- peak, duration	uency and du ld exist for than 1% of ination of s n, and profi	ration of <u>up to 8</u> plant lif pecified le):	abnorm hours e. acciden
	(4)	Stat cond per Acci para (a)	e anticipated oc itions: <u>These c</u> excursion and wi dent (worst case meter including p Temperature (°F	currence frequent onditions could 11 occur less for any combi- peak, duration ) <u>195</u>	uency and du ld exist for than 1% of ination of s n, and profi Accident	ration of <u>up to 8</u> plant lif pecified le): type <u>RH/</u>	abnorm hours e. acciden
	(4)	Stat cond per Acci para (a) (b)	e anticipated oc itions: <u>These c</u> excursion and wi dent (worst case meter including Temperature (°F Pressure (psig)	currence frequent onditions could 11 occur less for any combi- peak, duration ) <u>195</u> 0.03	uency and du ld exist for than 1% of ination of s n, and profi Accident Accident	ration of <u>up to 8</u> plant lif pecified le): type <u>RH/</u>	abnorm hours e. acciden A
	(4)	Stat cond per Acci para (a) (b) (c)	e anticipated oc itions: <u>These c</u> <u>excursion and wi</u> dent (worst case meter including ) Temperature (°F Pressure (psig) Humidity (%)	currence frequent onditions could 11 occur less for any combi- peak, duration ) 195 0.03 100	uency and du ld exist for than 1% of ination of s n, and profi Accident Accident Accident	ration of <u>up to 8</u> plant lif pecified le): type <u>RH/</u> type <u>RH/</u>	abnorm hours e. acciden A A CV/AB/A
	(4)	Stat cond per Acci para (a) (b) (c) (d)	e anticipated oc itions: <u>These c</u> <u>excursion and wi</u> dent (worst case meter including Temperature (°F Pressure (psig) Humidity (%) Radiation (rd)	currence frequence onditions could for any combination of the second state of the sec	uency and du ld exist for than 1% of ination of s and profi Accident Accident Accident Accident	ration of <u>up to 8</u> plant lif pecified le): type <u>RH/</u> type <u>RH/</u> type <u>RH/</u>	abnorm hours e. acciden A CV/AB/A A/HELB
	(4)	Stat cond per Acci para (a) (b) (c) (d) (e)	e anticipated oc itions: <u>These c</u> <u>excursion and wi</u> dent (worst case meter including ) Temperature (°F Pressure (psig) Humidity (%) Radiation (rd) Spray Type	currence frequent onditions could 11 occur less for any combi- peak, duration ) 195 0.03 100 6.21 x 10 *	uency and du ld exist for than 1% of ination of s n, and profi Accident Accident Accident Accident Accident	ration of <u>up to 8</u> plant lif pecified le): type <u>RH/</u> type <u>RH/</u> type <u>RH/</u> type <u>LOC</u>	abnorm hours e. acciden A A <u>CV/AB/A</u> A/HELB

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TEMPERA	TURE SWITCHES CHECKED AWL DATE 8/26/86 fer - 4/23/14/1
K. <u>REQU</u>	<u> IIRED OPERATING ENVIRONMENT</u> (Continued)
	Comments (duration/peak/profile/spray composition and pH, margin, etc.): Accident temperature and pressure will
	decrease linearly to the normal maximum at the end of 24
	hours.
(6)	Is the equipment subject to moisture or liquid intrusion whi can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? <u>Yes</u> (Reference: <u>See</u> <u>Environmental Data Drawing 47E235-48, note 47</u>
(7)	Subject to submergence (Yes/No/NA)? <u>No</u> (Reference: <u>See</u> pages B-51 and B-52
	Identify initiation time and duration of submergence: <u>NA</u>
(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>No*</u> (Reference: <u>Environmental Data Drawing 47E235-48</u>
	If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA</u>
	* Location is outside the reactor building, therefore no
	beta contribution.
(9)	Special environmental calculations (temp., rad., etc.)
	Type RIMS No.
	See TAB B, Section A See TAB B, Section A
	<u> </u>

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TE	DER TI	TLESTATIC-O-RINGCOMPUTED BDMDATE6/03/86WCG2.2004/04/897-TURE SWITCHESCHECKED AWLDATE6/03/86KBN2.004/28/89%
К.	<u>REQU</u>	IRED OPERATING ENVIRONMENT
	Refe	rence Environmental Drawing No. <u>47E235-56, -57 (713' Rm A06)</u>
4	(1)	Normal Max (2) Abnormal Max
		(a) Temperature (°F) <u>104</u> (a) Temperature (°F) <u>110</u>
		(b) Pressure (psig) ATM(-) (b) Pressure (psig) ATM(-
		(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>
		(d) Radiation (rd) <u>2.2x10 g</u> amma(d) Radiation (rd) <u>NA</u>
	(3)	Process Interfaces: None
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours per excursion and will occur less than 1% of plant life.
	(4)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):
	(4) (5)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accide parameter including peak, duration, and profile): (a) Temperature (°F) <u>199*</u> Accident type <u>RH</u> .
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 199*         Accident type RH         (b) Pressure (psig) 0.03
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 199*         Accident type RH         (b) Pressure (psig) 0.03         Accident type RH         (c) Humidity (%)
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 199*         Accident type RH         (b) Pressure (psig) 0.03         Accident type AB         (c) Humidity (%)         (d) Radiation (rd) 2 x 10 ⁶
	(4)	State anticipated occurrence frequency and duration of abnormal conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 199*         Accident type RH         (b) Pressure (psig) 0.03         Accident type RH/CV/AI         (c) Humidity (%)       100         Accident type RH/CV/AI         (d) Radiation (rd) $2 \times 10^6$ Accident type NA

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BINDER TI	TLE <u>STATIC-O-RING</u> COMPUTE	D BDM DATE 8/19/86 wer
TEMPERA	TURE SWITCHES CHECKEI	<u>AWL</u> DATE <u>8/26/86 ۲۸۸)</u> 4/42/61
K. <u>REQU</u>	IRED OPERATING ENVIRONMENT (C	ontinued)
	Comments (duration/peak/profi margin, etc.): <u>Accident temp</u>	le/spray composition and pH, erature and pressure will
	decrease linearly to the norm	al maximum values at the end of
	24 hours.	
(6)	Is the equipment subject to m can affect the performance of accident conditions (Yes/No/M Environmental Data Drawing 47	oisture or liquid intrusion which the equipment under design base A)? <u>Yes</u> (Reference: <u>See</u> E235-56, note 47
(7)	Subject to submergence (Yes/N pages B-51 and B-52	o/NA)? <u>No</u> (Reference: <u>See</u>
	Identify initiation time and	duration of submergence: <u>NA</u>
•		
(8)	Is the equipment subject to a the total accident dose (Yes/ (Reference: <u>Environmental Da</u>	beta radiation contribution to No/NA)? <u>No*</u> ta Drawing 47E235-56
	If yes, identify the fraction beta dose to be added to the	of the unattenuated free field total dose and justify: <u>NA</u>
	* Location is outside the rea	ctor building, therefore no
	beta contribution.	
(9)	Special environmental calcula	tions (temp., rad., etc.)
	Type	RIMS No.
	See TAB B. Section A	See TAB B. Section A
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<u> </u>	DER TI	TLE_STATIC-O-RINGCOMPUTED_BDMDATE $6/03/86$ WCG $\omega$ 04/04/89 $7-3$ ATURE SWITCHESCHECKED_AWLDATE $6/03/86$ KBN $\beta/7$ 04/28/89 $\leq/2$
К.	<u>REQU</u> Refe	VIRED OPERATING ENVIRONMENT erence Environmental Drawing No. <u>47E235-60, -59 (692' Rm A08)</u>
•	(1)	Normal Max (2) Abnormal Max
		(a) Temperature (°F) <u>104</u> (a) Temperature (°F) <u>110</u>
		(b) Pressure (psig) <u>ATM(-)</u> (b) Pressure (psig) <u>ATM(-)</u>
		(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>
		(d) Radiation (rd) $7.5 \times 10^{6}$ gamma(d) Radiation (rd) NA
	(3)	Process Interfaces: <u>None</u>
		· · · · · · · · · · · · · · · · · · ·
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: These conditions could exist for up to 8 hours per excursion and will occur less than 1% of plant life.
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accident parameter including peak, duration, and profile): (a) Temperature (°F) <u>210*</u> Accident type <u>RH</u>
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):         (a) Temperature (°F) 210*         Accident type RH         (b) Pressure (psig) 0.03
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):         (a) Temperature (°F) 210*         Accident type RH         (b) Pressure (psig) 0.03         Accident type RH/AB         (c) Humidity (%)
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):         (a) Temperature (°F) 210*         (b) Pressure (psig) 0.03         Accident type RH/AB         (c) Humidity (%) 100         Accident type RH/CV/AB/AF         (d) Radiation (rd) 5x10 ⁶ gamma
	(4)	State anticipated occurrence frequency and duration of abnorma conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):         (a) Temperature (°F) 210*         Accident type RH         (b) Pressure (psig) 0.03         Accident type RH/AB         (c) Humidity (%) 100         Accident type RH/CV/AB/AF         (d) Radiation (rd) 5x10 ⁶ gamma         Accident type NA

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TEMPERA	TURE SWITCHES CHECKED AWL	DATE <u>8/25/86 Kith</u>
K. <u>REQU</u>	IRED OPERATING ENVIRONMENT (Continue)	i)
	Comments (duration/peak/profile/spray margin, etc.): <u>Accident temperature</u>	y composition and pH, and pressure will
	decrease linearly to the normal maxim	num values at the end of
(6)	Is the equipment subject to moisture can affect the performance of the equ accident conditions (Yes/No/NA)? Yes Environmental Data Drawing 47E235-60	or liquid intrusion whic ipment under design basi (Reference: <u>See</u> note 47
(7)	Subject to submergence (Yes/No/NA)?	<u>No</u> (Reference: <u>See</u> )
	Identify initiation time and duration	n of submergence: <u>NA</u>
	* See Open Item No. 1 for 1-TS-30-201	LA and -202A
(8)	Is the equipment subject to a beta rathe total accident dose (Yes/No/NA)? (Reference: <u>Environmental Data Drawing</u> )	Adiation contribution to <u>No*</u> ing 47E235-60 )
	beta dose to be added to the total do	ose and justify: <u>NA</u>
	* Location is outside the reactor buint beta contribution.	ilding. therefore no
(9)	Special environmental calculations (t	emp., rad., etc.)
	Type	RIMS No.
	See TAB B. Section A	See TAB B. Section A
		· · · · · · · · · · · · · · · · · · ·

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	PERA	TURE SWITCHES         CHECKED_AWL         DATE         6/03/86         KBN         Red           04/28/89         8
K	REOU	IRED OPERATING ENVIRONMENT
	Refe	rence Environmental Drawing No. <u>47E235-48 (737' Rm A09)</u>
ব	(1)	Normal Max (2) Abnormal Max
		(a) Temperature (°F) <u>104</u> (a) Temperature (°F) <u>110</u>
		(b) Pressure (psig) <u>ATM(-)</u> (b) Pressure (psig) <u>ATM(-</u>
		(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>
		(d) Radiation (rd) $\frac{5}{8.8 \times 10}$ gamma(d) Radiation (rd) NA
	(3)	Process Interfaces: <u>None</u>
		· · ·
	(4)	State anticipated occurrence frequency and duration of abnor
	(4)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u>
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours per excursion and will occur less than 1% of plant life.
	(4)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u>
	(4)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accide
	(4)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):
	(4)	State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u> <u>per excursion and will occur less than 1% of plant life.</u> Accident (worst case for any combination of specified accide parameter including peak, duration, and profile): (a) Temperature (°F) <u>110</u> Accident type <u>L</u>
	(4)	State anticipated occurrence frequency and duration of abnor conditions:       These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 110         Accident type L         (b) Pressure (psig) NA         Accident type L         (c) Humidity (%)
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 110         Accident type L         (b) Pressure (psig) NA         Accident type L         (c) Humidity (%)         NA         Accident type L         (d) Pressure (resign to the provide the parameter type to provide the parameter type to provide the parameter type to p
	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hoursper excursion and will occur less than 1% of plant life.Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):(a) Temperature (°F) 110Accident type L(b) Pressure (psig) NAAccident type L(c) Humidity (%)NAAccident type L(d) Radiation (rd) $1.18 \times 10^6 \star$ Accident type LOCA/HELE
· · · · · · · · · · · · · · · · · · ·	(4)	State anticipated occurrence frequency and duration of abnor conditions: These conditions could exist for up to 8 hours         per excursion and will occur less than 1% of plant life.         Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):         (a) Temperature (°F) 110         Accident type L         (b) Pressure (psig) NA         Accident type L         (c) Humidity (%)         NA         Accident type L         (d) Radiation (rd)         1.18 x 10 ⁶ *         Accident type NA         Accident type NA

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INDER_TI	RR TLESTATIC-O-RINGCOMPUTED_BDMDATE <u>8/19/86</u>
TEMPERA	TURE SWITCHES CHECKED AWL DATE 8/23/86+46)
C. <u>REQU</u>	IRED OPERATING ENVIRONMENT (Continued)
a	Comments (duration/peak/profile/spray composition and pH, margin, etc.): <u>Accident temperature and pressure will</u>
	decrease linearly to the normal maximum values at the end
	of 24 hours.
(6)	Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design basis accident conditions (Yes/No/NA)? <u>Yes</u> (Reference: <u>See</u> <u>Environmental Data Drawing 47E235-48, note 47</u> ).
(7)	Subject to submergence (Yes/No/NA)? <u>No</u> (Reference: <u>See</u> pages B-51 and B-52 and Open Item No. 3 ).
	Identify initiation time and duration of submergence: <u>NA</u>
(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>No*</u> (Reference: <u>Environmental Data Drawing 47E235-48</u> ).
	If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>NA</u>
	* Location is outside of the reactor building, therefore no
	beta contribution.
(9)	Special environmental calculations (temp., rad., etc.)
	Type RIMS_No.
	See TAB B, Section A See TAB B, Section A

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BINDER T	ITLE <u>STATIC-O-</u>	-RING	_ COMPUTED <u>BI</u>	M DATI	E <u>8/12</u>	186	
TEMPER	ATURE SWITCHES		_ CHECKED <u>AWI</u>	DATI	E <u>8/16</u>	<u>/86 Kb</u> 4/12-	N 169
K. <u>REQ</u> I	JIRED OPERATING	ENVIRO	NMENT				
Refe	erence Environm	ental Di	rawing No. <u>47</u>	<u>E235-78 (75</u>	57'Rm	A16)	
(1)	Normal Max		(2)	Abnormal Ma	LX.	<u></u>	
	(a) Temperatu	re (°F)	104	(a) Temper	ature	(°F)	110
	(b) Pressure	(psig)	ATM	(b) Pressu	ure (ps	sig)	ATM
	(c) Humidity	(%)	80	(c) Humidi	ty (%)	)	90
	(d) Radiation	(rd)	3 <u>1.8x10 g</u> amma	(d) Radiat	ion (1	rd)	NA
(3)	Process Inter	faces:	None				<del></del>
(4)	State anticipa conditions:	ated occ These co	currence freq	uency and d ld exist fo	uratic r <u>up</u> t	on of a to 8 he	abnorm ours
(4)	State anticipa conditions: <u>per excursion</u> Accident (wors	ated occ These co and wil st case	currence freq onditions cou l occur less for any comb	uency and d ld exist fo than 1% of ination of	uratio <u>r up t</u> <u>plant</u> specif	on of a co 8 ho : life ied ac	abnorm ours
(4)	State anticip conditions: <u>per excursion</u> Accident (wors parameter inc)	ated occ These co and wil st case luding p	for any combined, duration	uency and d ld exist fo than 1% of ination of a, and prof	uratio r_up_t _plant specif ile):	on of a	abnorm ours
(4)	State anticip conditions: <u>per excursion</u> Accident (wors parameter incl (a) Temperatu	ated occ These co and wil st case luding p ure (°F)	for any combinet, duration	uency and d ld exist fo than 1% of ination of a, and prof Accident	uratic <u>r up t</u> <u>plant</u> specif ile): type	on of a co 8 ho : life ied ac LOCA	abnorm ours
(4)	State anticip conditions: <u>per excursion</u> Accident (wors parameter inc) (a) Temperatu (b) Pressure	ated occ These co and wil st case luding p ure (°F) (psig)	currence freq mditions cou 1 occur less for any comb eak, duration 110 NA	uency and d ld exist fo than 1% of ination of and prof Accident Accident	uratio <u>r_up_t</u> <u>plant</u> specif ile): type type	on of a co 8 ho : life ied ac LOCA LOCA	abnorm ours
(4)	State anticip conditions: <u>per excursion</u> Accident (wors parameter incl (a) Temperatu (b) Pressure (c) Humidity	ated occ <u>These co</u> <u>and wil</u> st case luding p ure (°F) (psig) (%)	for any combined, duration	uency and d ld exist fo than 1% of ination of a, and prof Accident Accident	uratic <u>r up t</u> <u>plant</u> specif ile): type type type	ied ac LOCA	abnorm ours
(4) (5)	State anticip conditions: <u>per excursion</u> Accident (wors parameter inc. (a) Temperatu (b) Pressure (c) Humidity F(d) Radiation	ated occ <u>These co</u> <u>and wil</u> st case luding p ure (°F) (psig) (%) n (rd)	currence freq <u>inditions cou</u> <u>1 occur less</u> for any comb eak, duration <u>110</u> <u>NA</u> <u>NA</u> <u>1.8x10⁶ gamma</u>	uency and d <u>ld exist fo</u> <u>than 1% of</u> ination of and profination Accident Accident Accident	uratio <u>r_up_t</u> <u>plant</u> specif ile): type type type	on of a co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co co co co co co co co co co co co	abnorm ours
(4) (5)	State anticip conditions: <u>per excursion</u> Accident (wors parameter inc: (a) Temperatu (b) Pressure (c) Humidity (d) Radiation (e) Spray Typ	ated occ <u>These co</u> <u>and wil</u> st case luding p ure (°F) (psig) (%) h (rd) pe	currence freq onditions cou l occur less for any comb eak, duration <u>110</u> <u>NA</u> <u>NA</u> <u>1.8x10 gamma</u> <u>NA</u>	uency and d ld exist fo than 1% of ination of a, and prof Accident Accident Accident Accident Accident Accident	uratio <u>r up t</u> <u>plant</u> specif ile): type type type type type	on of a co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co 8 ho co co co co co co co co co co co co co	abnorm ours cciden
(4) (5) <u>Addi</u>	State anticip conditions: <u>per excursion</u> Accident (wors parameter inc: (a) Temperatu (b) Pressure (c) Humidity (d) Radiation (e) Spray Typ :ional Reference	ated occ <u>These co</u> <u>and wil</u> st case luding p ure (°F) (psig) (%) h (rd) pe <u>ces</u>	surrence freq enditions cou l occur less for any comb eak, duration <u>110</u> <u>NA</u> <u>NA</u> <u>1.8x10 gamma</u> <u>NA</u>	uency and d ld exist fo than 1% of ination of and prof Accident Accident Accident Accident Accident Accident	uratio <u>r_up_t</u> <u>plant</u> specif ile): type type type type	on of a con 8 ha con 8 ha con 1 ife ied ac LOCA LOCA LOCA NA	abnorm ours cciden
(4) (5) <u>Addi</u>	State anticip conditions: <u>per excursion</u> Accident (wors parameter inc: (a) Temperatu (b) Pressure (c) Humidity (d) Radiation (e) Spray Typ :ional Reference	ated occ <u>These co</u> <u>and wil</u> st case luding p ure (°F) (psig) (%) n (rd) pe <u>ces</u>	surrence freq enditions cou 1 occur less for any comb eak, duration 110 NA 1.8x10 ⁶ gamma NA	uency and d ld exist fo than 1% of ination of a, and prof Accident Accident Accident Accident Accident Accident	uratio <u>plant</u> <u>plant</u> specif ile): type type type type	on of a on of a ied ac LOCA LOCA LOCA NA	abnorm ours cciden

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PAGE B-46 R1

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TEMPERA	TURE SWITCHES CHECKE	D <u>AWL</u> DATE <u>8/25/86</u> 4	(fr)
K. <u>REQI</u>	IRED OPERATING ENVIRONMENT ( Comments (duration/peak/prof margin, etc.): Accident ten	Continued) ile/spray composition and	рН, 1
	decrease linearly to the nor	mal maximum values at the	end
	of 24 hours.		
(6)	Is the equipment subject to can affect the performance of accident conditions (Yes/No/ Environmental Data Drawing 4	moisture or liquid intrus of the equipment under des (NA)? <u>No</u> (Reference: 17E235-78	ion wh ign ba <u>See</u>
(7)	Subject to submergence (Yes, pages B-51 and B-52 and Oper	No/NA)? <u>No</u> (Reference Item No. 1	: <u>See</u>
	Identify initiation time and	duration of submergence:	NA
(8)	Is the equipment subject to the total accident dose (Yes (Reference: <u>Environmental I</u>	a beta radiation contribu /No/NA)? <u>No</u> Data Drawing 47E235-78	tion t
	If yes, identify the fraction beta dose to be added to the	on of the unattenuated fre total dose and justify:	e fiel _NA
	Location is outside the read	tor building, therefore n	o beta
	contribution.	<u> </u>	
(9)	Special environmental calcul	ations (temp., rad., etc.	)
	Ţvpe	RIMS No.	
	See TAB B, Section A	<u>See TAB B. Secti</u>	on A
•			··-

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BINDER 1	TITLE_ <u>STATIC-O-RING</u> COMPUTED_BDMDATE 6/03/86 wer
TEMPER	RATURE SWITCHES CHECKED AWL DATE 6/04/86 KEN
K. <u>RE(</u>	QUIRED OPERATING_ENVIRONMENT
Rei	ference Environmental Drawing No. <u>47E235-59, -61, (713' A28)</u>
(1)	) Normal Max (2) Abnormal Max
	(a) Temperature (°F) <u>104</u> (a) Temperature (°F) <u>110</u>
	(b) Pressure (psig) <u>Atm(-)</u> (b) Pressure (psig) <u>Atm(</u>
	(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u> 7.5x10 ⁶
	(d) Radiation (rd) <u>gamma</u> (d) Radiation (rd) <u>NA</u>
(3)	) Process Interfaces: <u>None</u>
(4)	) State anticipated occurrence frequency and duration of abnor conditions: <u>These conditions could exist for up to 8 hours</u>
	per excursion and will occur less than 1% of plant life.
(5)	) Accident (worst case for any combination of specified accide parameter including peak, duration, and profile):
	(a) Temperature (°F) <u>210</u> Accident type <u>RH</u>
	(b) Pressure (psig) <u>0.03</u> Accident type <u>RH</u>
	(c) Humidity (%) <u>100</u> Accident type <u>RH/CV</u>
	<pre>(c) Humidity (%) <u>100</u> Accident type <u>RH/CV</u> (d) Radiation (rd) <u>5x10⁶gamma</u> Accident type <u>LOCA</u></pre>
	<ul> <li>(c) Humidity (%) <u>100</u> Accident type <u>RH/CV</u></li> <li>(d) Radiation (rd) <u>5x10⁶ gamma</u> Accident type <u>LOCA</u></li> <li>(e) Spray Type <u>NA</u> Accident type <u>NA</u></li> </ul>
	<pre>(c) Humidity (%) <u>100</u> Accident type <u>RH/CV</u> (d) Radiation (rd) <u>5x10⁶gamma</u> Accident type <u>LOCA</u> (e) Spray Type <u>NA</u> Accident type <u>NA</u></pre>

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TEMPERA	ATURE SWITCHES CHECKED AWL DATE 8/16/86 Ker
	4/23/j29
K. <u>REQI</u>	<u> IIRED_OPERATING_ENVIRONMENT</u> (Continued)
	Comments (duration/peak/profile/spray composition and pH, margin, etc.): <u>Accident temperature and pressure will</u>
	decrease linearly to the normal maximum values at the end
	of 24 hours.
(6)	Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? <u>Yes</u> (Reference:
	See Environmental Data drawing 47E235-61, note 47
(7)	Subject to submergence (Yes/No/NA)? <u>No*</u> (Reference: See pages B-51 and B-52 and Environmental Data Drawing 47E235-61, Table 1.
•	Identify initiation time and duration of submergence: <u>NA</u>
	*See Open Item No. 1 for system 74 switches
(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>No*</u> (Reference: <u>Drawing 47E235-61</u>
	If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify:
	*Equipment located outside the reactor building, therefore
	no beta contribution.
(9)	Special environmental calculations (temp., rad., etc.)
	Type RIMS No.
	See TAB B, Section A See TAB B, Section A

PLUSEQ/139.58

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1	BINDER NO. WBNEQ-ITS-002 PLANT	WBN UNIT(S)	1 SHEET46_ OF60
(	BINDER TITLE STATIC 0-RING		DATE 63.86
	TEMPERATURE SWITCHES	CHECKED <u>AWR</u>	DATE <u>6/3/82</u>

K.(6) <u>GENERAL:</u>

Justification for Eliminating Consideration of Moisture Intrusion into SOR Temperature Switches

In 17344-82N-C, where moisture intrusion through the seal was noted, the LOCA test conditions included 100% relative humidity, a 120 psig atmosphere, and a 6200 ppm Boron spray. During an accident, the equipment would be exposed to 100% humidity at less than 0.1 psig (no caustic spray): therefore, there would be no driving force for moisture intrusion.

Also, the LOCA/HELB test of 18577-83N was run with the same model switch using the same types of materials at 100% humidity but without caustic spray and only a 48 psig atmosphere and moisture intrusion was not observed. (Insulation resistance at post-HELB test was in excess of 1 Giga. ohm. SOR provides a conduit seal on these switches; therefore, based on the above, moisture intrusion need not be considered.

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BINDER NO. WBN	EQ-ITS-002 P	LANT <u>WBN</u> UNIT(S)	<u>1</u>
BINDER TITLE	STATIC-0-RING	COMPUTED_BDM DA	R_1_ R ATE <u>8/20/86 wer</u>
TEMPERATURE	SWITCHES	CHECKED AWL DA	ATE 8/25/86 / Ca
			4/221/1047
K.(/) <u>GENER</u>	AL SUBMERGENCE	<u>EVALUATION</u>	
			Worst Case
-	Actual	Floor Elevation/	Accident/Flood
Component	Elevation	Rm#/Required Accident	Level (Environmental R1
<u>(TAB_A)</u>	<u>(TAB F)</u>	(TAB·A)	Data Drawings)
0-TS-12-944	708'	6921/A29/AB	6921-21
0 - TS - 12 - 94R	708'-0"	692 /A29/AD	·692'-2''
0 - TS - 12 - 97A	705'-7 1/2"	692'/A30/AB	692'-2"
0 - TS - 12 - 97B	704'-6 1/2"	692'/A30/AB	692'-2"
0 - TS - 30 - 192A	741'-6"	737'/A01/I. RH. CV. AF. AB	052 -2 NA
0 - TS - 30 - 192B	741 '6"	737'/A01/L.RH.CV.AF.AB	NA
0 - TS - 30 - 193A	741 5 1/2"	737'/A01/I, RH CV AF AB	NA
0 - TS - 30 - 193R	742'-1"	737'/A01/I, RH CV AF AB	NA
1 - TS - 30 - 194A	739'-11"	$737'/A05/I_{1}RH_{1}CV_{2}AF_{1}AB$	NA
1 - TS - 30 - 194B	739'-0"	737'/A05/L, RH, CV, AF, AB	NA
1 - TS - 30 - 195A	740'-3"	737'/A05/L, RH, CV, AF, AB	NA
1-TS-30-195B	740'-4"	737'/A05/L.RH.CV.AF.AB	NA
1-TS-30-196A	715'-5 1/2"	713'/A06/L.RH.CV.AF.AB	713'1"
1-TS-30-196B	714'-10"	713'/A06/L.RH.CV.AF.AB	713'1"
1-TS-30-197A	714'-2 1/2"	713'/A06/L.RH.CV.AF.AB	713'1"
1-TS-30-197B	714'-2 1/2"	713'/A06/L.RH.CV.AF.AB	713'1"
1-TS-30-201A	*	692'/A08/L.RH.CV.AF.AB	692'2"
1-TS-30-201B	696'-3 1/2"	692'/A08/L,RH,CV,AF,AB	692'2"
1-TS-30-202A	*	692'/A08/L.RH.CV.AF.AB	692'2"
1-TS-30-202B	.696'-3 1/4"	692'/A08/L,RH,CV,AF,AB	692'2"
2-TS-30-194A	746'-1"	737'/A09/L	NA
2-TS-30-194B	739 <b>'-8''</b>	737'/A09/L	NA
2-TS-30-195A	743'-0"	737'/A09/L	NA
2-TS-30-195B	739'-7 1/2"	737'/A09/L	NA
2-TS-30-200A	760'-11"	737'/A16/L	NA
2-TS-30-207A	758'-9 1/2"	737'/A16/L	NA
1-TS-74-43	*	713'/A28/RH,CV	713'-3"
1-TS-74-44	*	713'/A28/RH,CV	713'-3"
1-TS-74-45	*	713'/A28/RH,CV	713'-3"

*See Open Item No. 1

1-TS-74-46

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|R1

713'-3"

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713'/A28/RH,CV

BINDER NO. WBNEQ-ITS-002 PLANT	WBN UNIT(S) 1 SHEET 48 OF 60
BINDER TITLE STATIC 0-RING	_ COMPUTED DATE 6-3-86
TEMPERATURE SWITCHES	CHECKED DATE 6/3/8

K.(7) GENERAL:

All temperature switches are located greater than 1.0' above respective floor elevations. The flood levels do not exceed 3" above floor elevations: therefore, the temperature switches are not subject to submergence.

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BINDER NO. WB	NEO-ITS-002 PL	ANT <u>WBN</u>	_ UNIT(S)	<u>1</u> SE	IEET <u>49</u>	_0F <u>_60</u> _
				F	≀ <u> </u>	
BINDER TITLE_	STATIC-O-RING	COMPUTED_BDN	1 DATE	<u>6/13/8</u> 6_	WCG	<u> x 2 m</u>
				C	)4/04/89	7-26-89
	SWITCHES	_ CHECKED_AWL,	<u>/RNB</u> DATE	<u>6/13/8</u> 6_	KBN	117
				C	)4/28/89	42/50

### L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case.maximum parameters:

Parameter	<u>Specified</u>	Demonstrated	Reference
Operating Time	100		page 7-41
Temperature (°F)	219	_430	page 7-41
Pressure (psig)	Atm	<u>120 psig</u>	page 7-41
Relative Humidity (%)	. 100	_100	page 7-36
Chemical Spray*	<u>NA</u>	<u>NA</u>	NA
Radiation (rd)**	ganma	gamma	<u>See page 20(1)</u> R2
Submergence	NA	NA	<u>NA</u>

*Includes spray concentration, flowrate, density, duration, and pH.

**Enter 40-year integrated normal dose plus integrated accident dose and specify type.

R2

(2) Comparison of worst-case profiles and margin assessment:

	Test Profile				
Parameter	Envelopes Specified (Yes/No/NA)	Reference			
Temperature	Yes	Fig 14 page 7-41			
Pressure	Yes	Fig 14 page 7-41			
Relative Humidity	Yes	Sect. 7.10.3 page 7-36			
Chemical Spray	NA	NA			
Submergence	NA	NA			
JUSTIFICATION/COMMENTS	(1) The 30-day DBE	simulation			
translates into more than the 100 days required operating					
time See post DPF life calculation in TAR (					
CTWC: DEE DOBC-DDE III	<u>e carcuraeton th tup</u>				

**PAGE B-53 R2** 



TEM	PERA	TURE SWITCHES CHECKED AWL D	ATE <u>8/16/8</u> 6	<u>Ken</u>
L.	SUMM/ (Cont	ARY COMPARISON OF TEST CONDITIONS TO SPECI tinued)	FIED CONDIT	IONS
	(3)	Were margins applied to the test paramete addressed in the test program to assure t and uncertainties are accounted for? (No Yes/No/NA).	rs or other hat normal te margin a	wise variation pplied,
		Suggested Margins per IEEE-323(74)	Margin <u>Applied</u>	Yes/No/NA
		Temperature: +15 degrees F	<u>&gt;15°F</u>	Yes
		Pressure: +10% but no more than 10 psig	<u>+120 psig</u>	Yes
		Radiation: +10% of accident dose	>> 10%	Yes
		Time: +10% (or 1 hour + operating time per NUREG-0588)	+ 376%	See (1) below
		Voltage: ±10% of rated value	51 (2)	Yes
		Frequency: ±5% of rated value	NA	NA
		Environmental Transient: the initial transient and the peak temperature applied twice	2 <u>Transient</u> s	Yes
		Vibration: +10% added to acceleration	NA	NA
		JUSTIFICATION/COMMENTS (1) Yes: this fig	ure reflect:	s the
		margin between the equivalent post-DBE li	fe calculat	ed in
		TAB C, page 3. and athe required post-DBE	life.	
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BINDER	NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 51 OF R R R R R R R R R R R R R R R R R R R
	RATURE SWITCHES CHECKED ATE 4/3/84
L.	SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)
	(2)Per 17344-82N-C, Appendix F, page 22 and Section 7.1.1, page 7-1,
	the switch has been tested with the application of a higher than rated voltage (1240 VAC rms for 1 minute) to demonstrate that the switch can
	operate safely at rated voltage and withstand momentary surges due to
, ,	switching. A large margin is also provided by plant application since the plant circuit is 120 VAC (Vital Instr. Power Calculation, reference
	TAB E), and the maximum rated value of the switch is 250 VAC (reference
	TAB I). During DBE testing 120 VAC @ 5amps was applied (sect. 7.10.5, page 7-42) which falls within ⁺ 10% of normal plant voltage.

TEM	PERAT	URE SWITCHES CHECKED AND DATE 4/4/86
м.	OPER	ABILITY TEST RESULTS
2	(1)	Identify the safety function(s) of this equipment: (Reference See TAB A ).
		JUSTIFICATION/COMMENTS
	(2)	Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference See pages 55 and 56 ).
		JUSTIFICATION/COMMENTS
	(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference See pages 55 and 56 ).
		JUSTIFICATION/COMMENTS
	(4)	Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? Yes (Reference See Section 8.3 and Table 5, and post-DBE calculation in TAB C ).
		JUSTIFICATION/COMMENTS
	(5)	Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference See below ).
		JUSTIFICATION/COMMENTS See Section 7.11, page 7-42 and Section
		8.3, page 8-2 and pages 53 and 54 for justification.

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BINDER NO. WBNEQ-ITS-002 PLANT_	WBN UNIT(S) 1 SHEET 53 OF 60
BINDER TITLE STATIC O-RING	COMPUTEDBDm DATE
TEMPERATURE SWITCHES	CHECKED AND DATE 6/4/8

# M. OPERABILITY TEST RESULTS

- (5) <u>Test Anomalies</u>
- 1. Due to functional anomalies noted for other test units being simultaneously tested with the SOR test unit, Magnetrol decided to interrupt the LOCA/MSLB simulation test to investigate. The specified test chamber step-down to 259°F/20 psig was continued to room ambient. Test restart was initiated after a 25.5 hour downtime. Calrod-induced heating, in lieu of additional steam injection, was utilized to retain the 259°F/20 psig plateau. A 25.5 hour period was added to the end of the test. The SOR test unit was operated without anomaly both immediately prior to the test chamber cooldown and immediately subsequent to re-achieving the 259°F/20 psig plateau.
- 2. Visual inspection of the test unit after post-LOCA/MSLB simulation testing revealed that the switch lead wires, external to the sealed electrical port, were brittle and cracked. This, however, did not affect the function of the unit as shown by the results of functional tests run during the simulation in Table 5, page 7-43; therefore, this anomaly is not significant.
- 3. The insulation resistance of the test unit decreased significantly (see Table 5, page 7-43) due to moisture/condensate penetration of the switch housing. Despite this, the test unit did function; therefore, this anomaly is not significant.

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	BINDER NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 54 OF BINDER TITLE STATIC O-RING COMPUTED BAM DATE 6-436 R R R TEMPERATURE SWITCHES CHECKED AND DATE 4/4/26	60
	Test Anomalies (Continued)	
	4. As shown in Table 5, page 7-43, the test unit failed the post-LOCA	
	which meets the requirements specified in the Category and Operating	
	Times for these temperature switches. This anomaly, therefore, is not	•
	significant (reference sections 7.11 and 8.3).	
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	PAGEB-58	

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BINDER NOWBNEQ-ITS-002 PLAN	TWBNUNIT(S)	1 SHEET5 OF60
BINDER TITLE STATIC 0-RING	COMPUTED BOM	DATE <u>2-4-66</u>
TEMPERATURE SWITCHES	CHECKED ANR	DATE4/4/86

From TAB B, Section M(2) and M(3):

The switch in 17344-82N-C was exposed to a simulated LOCA/MSLB. In the test setup, however, the switch housing was not vented. As a result, the high temperatures in the simulation caused a pressure buildup within the sealed housing and therefore a shift in the setpoint of the switch. This effect was noted in Table 5, page 7-43 of 17344-82N-C. In order to demonstrate the ability of the Model 12TA-B4 switch to perform its intended function, a second switch was tested in a simulated design basis accident (reference 18577-83N, TAB D). This second switch, S/N 82-6-1267R, was built using various previously aged parts from switches in test reports 17344-82N-C, 17344-82N-D and Addendum I of 17344-82N-D (reference SOR letter TAB E, page 8). This was necessary to place the tested unit in an end-of-life condition. The resulting test unit was a model 12TA-B4 switch with identical materials as were in the switch tested in 17344-82N-C. All materials were in an end-of-life condition at least equal to those in 17344-82N-C before the simulated LOCA test.

As shown in Figure 2, page 4-4 of 18577-83N, the second switch was vented to the atmosphere during the simulation. Table 1, page 4-7 of the same report shows the results of baseline and functional tests performed during the simulation. The setpoints for the switch ranged from 2.85 psig to 3.20 psig increasing and from 2.75 psig to 2.98 psig decreasing.

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BINDER NO. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 SHEET 56 OF 60 R 4 R BINDER TITLE STATIC O-RING COMPUTED BDM DATE 6-4-86 were 7-10-90 TEMPERATURE SWITCHES CHECKED AWL DATE 6-4-86 From TAB B, Section M(2) and M(3): The tested unit successfully performed its intended safety function. Since the temperature switch is a pressure switch with a temperaturesensing bulb attached at the pressure port, evidence that the pressure switch can perform its intended safety function is also evidence that the temperature switch will perform its intended safety function. For the justification for venting to the room atmosphere R4for the SOR switches see TABC, p. C-103

PAGEB-60 R4

TEMP	ERATURE SWITCHES CHECKED ARK DATE 43/86
N.	MAINTENANCE AND SURVEILLANCE Has the qualification program identified those surveillance, maintenance, and inspection parameters which are essential to maintain qualification an which aid in detecting degrading materials or equipment performance (yes/no/NA)? Yes (Enter all requirements in Section G of the EQC Binder Qualification Maintenance Data Sheets). JUSTIFICATION/COMMENTS See TAB G.
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TVA 19537 (OE-3-86)

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BIND TEMP	ER TIT ERATU	TLE STATIC O-RING COMPUTED $\beta M$ DATE SURE SWITCHES CHECKED $H M C$ DATE S	-22-26
0.	SUMM	ARY OF REVIEW	Yes/No/NA
	(1)	Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	Yes
	(2)	Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	<u>NA</u>
•	(3)	Choice of qualification methodology adequately justified?	Yes
	(4)	If analysis was performed, complete the following:	
		(a) Were equipment performance requirements identified?	Yes
		(b) Were specific features and failure modes and effects analyzed?	<u>NA</u>
		(c) Were assumptions and mathematical models used together with appropriate justification for their use?	Yes
·		(d) Were environmental parameters which affect equipment performance identified?	Yes
	(5)	Adequate similarity between equipment and test specimen established?	Yes
	(6)	Aging degradation evaluated adequately?	Yes
		(a) Mechanical and/or cycle aging addressed?	Yes
		(b) Equipment aged to end of life condition prior to application of DBE conditions?	Yes
		(c) Absence of preaging in test/analysis justified?	NA
		(d) Materials susceptible to thermal/radiation	Yes

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	D. WBNEQ-ITS-002 PLANT WBN UNIT(S) 1 TLE STATIC O-RING COMPUTED BDM DATE 5-2	SHEET. <u>59</u> OF_ RR
TEMPERATI	JRE SWITCHES CHECKED ANR DATE 6/3	/8%
0. <u>Sum</u>	MARY OF REVIEW (Continued)	Yes/No/NA
ч	(e) Normally operating state of device (e.g., normally energized) considered?	NA
(7)	Qualified life or replacement schedule established?	Yes
(8)	Criteria regarding temperature/pressure exposure satisfied?	Yes
	(a) Peak temperature adequate	Yes
	(b) Peak pressure adequate	Yes
	(c) Duration adequate	Yes
	(d) Required profile enveloped adequately	_Yes
	(e) Steam exposure adequate	Yes
(9)	Criteria regarding test sequence satisfied?	Yes
(10)	Criteria regarding spray satisfied?	NA
	(a) Was the spray testing done while under the extremes of pressure and temperature?	NA
	(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed those to be used for the plant?	<u>NA</u>
(11)	Criteria regarding submergence satisfied?	<u>NA</u>
(12)	Criteria regarding radiation satisfied?	Yes
•	(a) Was dose rate considered?	Yes
	(b) Was beta radiation considered?	NA
(13)	Criteria regarding operability status/mode satisfied?	Yes
(14)	Criteria regarding test failures or anomalies	_Yes

PAGE <u>B-63</u>

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O. SUMMARY OF REVIEW (Continued)       Yes/No/NA         (15) Criteria regarding functional testing satisfied?       Yes         (a) Does the test plan/report specify an acceptance required for equipment performed?       Yes         (b) Was an initial base line test done to establish required performance characteristics?       Yes         (c) Has the test/analysis demonstrated that performance yes       Yes         (c) Has the test/analysis demonstrated that performance yes       Yes         (c) Has the test/analysis demonstrated that performance yes       Yes         (c) Has the test/analysis demonstrated that performance yes       Yes         (c) Has the test/analysis demonstrated that performance Yes       Yes         (d) Criteria regarding instrument accuracy satisfied?       *         (16) Criteria regarding instrument accuracy satisfied?       *         (17) Test duration margin (1 hour + function time) yes       Yes         satisfied?       (a) Is the minimum specified operating time at least No       No	
<ul> <li>SUMMARY OF REVIEW (Continued)</li> <li>SUMMARY OF REVIEW (Continued)</li> <li>(15) Criteria regarding functional testing satisfied? Yes</li> <li>(a) Does the test plan/report specify an acceptance Yes</li> <li>(b) Was an initial base line test done to establish Yes</li> <li>(c) Has the test/analysis demonstrated that performance Yes</li> <li>(a) Is the minimum specified operating time at least No</li> <li>(a) Is the minimum specified operating time at least No</li> </ul>	
<ul> <li>(15) Criteria regarding functional testing satisfied? Yes</li> <li>(a) Does the test plan/report specify an acceptance Yes</li> <li>(b) Was an initial base line test done to establish required performance characteristics?</li> <li>(c) Has the test/analysis demonstrated that performance Yes performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?</li> <li>(16) Criteria regarding instrument accuracy satisfied? *</li> <li>(17) Test duration margin (1 hour + function time) Yes satisfied?</li> <li>(a) Is the minimum specified operating time at least No</li> </ul>	
<ul> <li>(a) Does the test plan/report specify an acceptance <u>Yes</u></li> <li>(b) Was an initial base line test done to establish <u>Yes</u></li> <li>(c) Has the test/analysis demonstrated that performance <u>Yes</u> performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?</li> <li>(16) Criteria regarding instrument accuracy satisfied? <u>*</u></li> <li>(17) Test duration margin (1 hour + function time) <u>Yes</u> satisfied?</li> <li>(a) Is the minimum specified operating time at least <u>No</u></li> </ul>	
<ul> <li>(b) Was an initial base line test done to establish <u>Yes</u> required performance characteristics?</li> <li>(c) Has the test/analysis demonstrated that performance <u>Yes</u> performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?</li> <li>(16) Criteria regarding instrument accuracy satisfied? <u>*</u></li> <li>(17) Test duration margin (1 hour + function time) <u>Yes</u> satisfied?</li> <li>(a) Is the minimum specified operating time at least <u>No</u> 1 hour?</li> </ul>	
<ul> <li>(c) Has the test/analysis demonstrated that performance Yes</li></ul>	
<ul> <li>(16) Criteria regarding instrument accuracy satisfied?</li></ul>	
<ul> <li>(17) Test duration margin (1 hour + function time) Yes</li> <li>satisfied?</li> <li>(a) Is the minimum specified operating time at least No</li> <li>1 hour?</li> </ul>	
(a) Is the minimum specified operating time at least <u>No</u> <u>1</u> hour?	
(b) If exception to the 1-hour minimum operating time <u>NA</u> was taken, was adequate justification provided?	
(18) Criteria regarding synergistic effects satisfied? <u>Yes</u>	
(19) Criteria regarding margins satisfied? <u>Yes</u>	
(20) Maintenance and surveillance requirements adequately <u>Yes</u> identified?	
P. <u>DISCUSSION</u>	
*See Open Items pages 1 and 2	

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PRINT DATE: 11/07/90

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WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS_NUMBER DESCRIPTION	UNIT DEVICE ID	NO. AZMITH MODEL NUMBER	LOCATION ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER_TIME</u>	<u>EVENT</u>	SAFETY FUNCTION
WBN-1-ZS -001-0005A -A SG1 MS HDR PWR RELIEF CNTL	1-ZS -001-000 VALVE POS SW	5A -A EA180-11302	729'	A01	A A	100D 100D	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM B1 VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -001-0005B -A SG1 MS HDR PWR RELIEF CNTL	1-ZS -001-000 Valve pos SW	5B -A EA180-11302	729'	A01	A A	100D 100D	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM BI VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -001-0012A -B SG2 MS HDR PRESS RELIEF CNT	1-ZS -001-001 L VLV POS SW	2A -B EA180-12302	729'	A02	A A	100D 100D	F₩⁄V MS⁄V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM B1 VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -001-0012B -B SG2 MS HDR PRESS RELIEF CNT	1-ZS -001-001 L VLV POS SW	2B -B EA180-11302	729	A20	A A	100D 100D	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM B1 VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
HBN-1-ZS -001-0023A -A SG3 MS HDR PRESS RELIEF CNT	1-ZS -001-002 L VLV POS SW	3A -A EA180-12302	729'	A02	A A	100D 100D .	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM BI VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.

preparer/date<u>D.R. Scontring A/22/86</u> checked/date<u>R.N. Bell A/22/86</u> KBN 11/8/90 <u>_____</u> 11/8/90



PRINT DATE: 11/07/90

BINDER NO. : WBNEQ-IZS -Manufacturer : Namco Page 2 of 21

#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO	<u>AZMITH</u> DEL_NUMBER	LOCATION ELEV(1) CONTRACT	<u>BM/RAD</u>	<u>CAT</u> (2)	OPER_TIME	EVENT	SAFETY FUNCTION
WBN-1-ZS -001-0023B -A SG3 MS HDR PRESS RELIEF CNT	1-ZS -001-0023B L VLV POS SH EA	-A 180-11302	729 <b>'</b>	A02	A A	100D 100D	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM B1 VERIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -001-0030A -B SG4 MS HDR PRESS RELIEF CNT	1-ZS -001-0030A L VLV POS SH EA	-B 180-11302	729'	A01	A A	100D 100A	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM B1 VARIABLE AND MUST BE MONITORED FOR THE DURATION OF THE EVENT.
WBN-1-ZS -001-0030B -B SG4 MS HDR PRESS RELIEF CNT	1~ZS -001-0030B L VLV POS SH EA	-B 180-11302	729"	A01	Å A	100D 100D	FW/V MS/V	MUST PROVIDE PORV POSITION INDICATION POSITION INDICATION IS A PAM BI VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -030-0002A -A Purge Air Sup Fan A Isln Va	1-FCV -030-0002/Z LVE POS SH EA	S1 -A 180-11302	737'	A05	A/B	5MN/100D	L .	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
WBN-1-ZS -030-0002B -A Purge Air Sup Fan A Isln Va	1-FCV -030-0002/Z LVE POS SH EA	S2 -A 180-12302	7 37 *	A05	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL Upon CNTMT ISOLATION SIGNAL

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PREPARER/DATE D.R. Scontring 9/22/BL 110/90 <u>IPH</u> 11/8/90 8 /22/BL CHECKED/DATE_<u>*R.N.Bell*</u>





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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID	NO. AZMITH MODEL_NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>. (2)</u>	<u>OPER TIME</u>	<u>EVENT</u>	SAFETY FUNCTION	
✓WBN-1-ZS -030-0005A - Purge Air Supply FAN B I	A 1-FCV -030-000 SLN VALVE POS SW	5/ZS1 -A EA180-11302	737 •	A05	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL	
∽WBN-1-ZS -030-0005B -/ Purge Air Supply Fanb IS	A 1-FCV -030-000 Ln valve pos SW	5/ZS2 -A EA180-12302	7 37 '	A05	A∕B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL	
WBN-1-ZS -030-0007A -/ Upper compt purge ISLN V/	A 1-ZS -030-000 Alve pos SW	7/1 -A 288 EA180-12302	795' 8 <b>"</b>	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAILUPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	•
₩BN-1-ZS -030-0007B -4 UPPER COMPT PURGE ISLN VA	A 1-ZS -030-000 Alve Pos SW	7/2 -A 288 EA180-11302	795' 8 <b>"</b>	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	R3
₩BN-1-ZS -030-0009A -F UPPER COMPT PURGE ISLN VA	1-ZS -030-000 LVE POS SW	9/1 -B 263 EA180-12302	800' 1"	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	

3 KEN 678/90 678/90 PREPARER DATE D. R. SCONTRING BLZZ 186 CHECKED/DATE R.N. BELL B/22/86

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BINDER NO. : WBNEQ-IZS MANUFACTURER : NAMCO PAGE 4 OF 21

# WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	<u>UNIT_D</u>	EVICE ID NO. Mode	AZMITH	LOCATI ELEV( CONTR	ON 1) ACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION	
∠WBN-1-ZS -030-0009B - UPPER COMPT PURGE ISLN V	B 1-ZS Alve pos s	-030-0009/2 W EA18	-B 263 80-11302	800"	14	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	र
✓WBN-1-ZS -030-0012A - ANNULUS PURGE VALVE POS	A 1-FCV Sw	-030-0012/ZSJ EA18	-A 360 0-12302	794"	9"	ANN	A/B A/B A/B A/B A/B	5MN/100D 5MN/100D 5MN/100D 15MN/1M0 1HR/1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL	
←WBN-1-ZS -030-0012B - Annulus purge valve pos	A 1-FCV Sh	-030-0012/ZS2 EA18	2 -A 260 0-11302	795'	37	ANN	A/B A/B A/B A/B A/B	5MN/100D 5MN/100D 5MN/100D 15MN/1M0 1HR/1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL	
WBN-1-ZS -030-0013A - Interim Absce Isln Valve	A 1-ZS POS SH	-030-0013/1 EA18	-A 0-11302	713'		A06	A/B	5,MN/100D	L .	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL	
✓WBN-1-ZS -030-0013B - Interim Absce Isln Valve	A 1-ZS Pos SW	-030-0013/2 EA18	-A 0-12302	713'		A06	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL	

R 3 PREPARER DATE D.R. SCONTEINO Bloz/06 KBN 5 JAJA CHECKED/DATE R.N. BELL 9/22/86 6/8/90

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## WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO. AZMITH	LOCATION- <u>HELEV(1)</u> <u>CONTRAC1</u>	RM/RAD	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION	
∽WBN-1-ZS -030-0014A Lower compt purge ISLN	-A 1-ZS -030-0014/1 -A 303 Valve Pos SW EA180-12302	739ª 2ª	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	•
└WBN-1-ZS -030-0014B Lower compt purge ISLN	-A 1-ZS -030-0014/2 -A 303 Valve pos SW EA180-11302	739* 3*	ANN	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	<b>R3</b>
✓ WBN-1-ZS -030-0016A LOWER COMPT PURGE ISLN	-B 1-FCV -030-0016/2S1 -B 240 Valve Pos SW EA180-12302	733' 8"	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	
₩BN-1-ZS -030-0016B LOWER COMPT PURGE ISLN	-B 1-FCV -030-0016/ZS2 -B 240 Valve Pos SW EA180-11302	733' 8 <b>"</b>	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	
✓ WBN-1-ZS -030-0018A INTERIM ABSCE ISLN VALV	-B 1-ZS -030-0018∕1 -B VE POS SM EA180-11302	713'	A06	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL	

KEN 1/90 PREPARER DATE D.R. SCONTEINO 8/22/86 CHECKED/DATE_<u>R.N. BELL</u> (X7 6/8/40 8/22/86

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BINDER NO. : WBNEQ-IZS -Manufacturer : Namco Page 6 OF 21

# WATTS BAR NUCL[®]EAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO. AZMITH MODEL NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION	
✓WBN-1-ZS -030-0018B -B Interim Absce Isln Valve P(	1-ZS -030-0018/2 -B OS SW EA180-12302	713'	A06	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL	•
∽WBN-1-ZS -030-0019A -B Incore Inst RM Purge ISLN \	1→ZS -030-0019/1 -B 058 VALVE POS SW EA180-12302	730' 4"	ANN	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	07
₩BN-1-ZS -030-0019B -B Incore Inst RM Purge ISLN V	1-ZS -030-0019∕2 -B 057 VALVE POS SW EA180-11302	730' 4 [#]	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.	3
∽WBN-1-ZS -030-0028A -A Interim Absce Isln valve po	1-ZS -030-0028/1 -A OS SW EA180-12302	737*	A05	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL	
WBN-1-ZS -030-0028B -A Interim Absce Isln Valve PC	1-ZS -030-0028∕2 -A DS SW EA180-11302	737'	A05	A∕B	5MN/100D	L .	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL	

PREPARER / DATE D.R. SCONTRINO 8/22/86 KEN 4/8/90 8/22/86 CAH 6/8/90 CHECKED/DATE R.N. BELL

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### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVICE ID NO AZMIT DESCRIPTION MODEL NUMBER	H ELEV(1) CONTRACT	RMZRAD	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
✓WBN-1-ZS -030-0029A -B 1-ZS -030-0029/1 -B Interim Absce ISLN VALVE POS SW EA180-12302	737 •	A05	A∕B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
✓ WBN-1-ZS -030-0029B -B 1-ZS -030-0029/2 -B INTERIM ABSCE ISLN VALVE POS SH EA180-11302	737 •	A05	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
⁽⁻ WBN-1-ZS -030-0037A -B 1-FCV -030-0037/ZS1 -B 280 Lower Compt Purge CNTL VALVE POS SW EA180-12302	719º 7"	ANN	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
✓ WBN-1-ZS -030-0037B -B 1-FCV -030-0037/ZS2 -B 280 LOWER COMPT PURGE CNTL VALVE POS SW EA180-11302	719' 1"	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
[↓] WBN-1-ZS -030-0051A -A 1-ZS -030-0051/1 -A 290 UPPER CNTMT EXH ISLN VALVE POS SW EA180-12302	745'11"	ANN	A A A A	100D 100D 100D 1MO 1MO	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.

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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

			-LOCATTON-					
EQIS NUMBER DESCRIPTION	UNIT DEVICE	<u>D NO. AZMITH</u> Model Number	ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>Cat</u> (2)	<u>OPER TIME</u>	<u>event</u>	SAFETY FUNCTION
₩BN-1-ZS -030-0051B - Upper CNTMT EXH ISLN VAL	A 1-ZS -030-00 Ve pos SW	051/2 -A 290 EA180-11302	745'11"	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
₩BN-1-ZS -030-0053A - UPPER CNTMT EXH ISLN VAL	8 1-ZS -030-00 /E POS SW	53/1 -B 252 EA180-11302	748 '	ANN	A A A A A	100D 100D 100D 1M0 1M0	L MS/C' FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
✓WBN-1-ZS -030-0053B -J UPPER CNTMT EXH ISLN VALV	) 1-ZS -030-00 /E POS SW	53/2 -B 252 EA180-12302	748 "	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
∨WBN-1-ZS -030-0054A -A Annulus exh Isln valve po	1-FCV -030-00 S SW	54/ZS1 -A 039 EA180-12302	729' 2"	ANN	A/B A/B A/B A/B A/B	5MN/100D 5MN/100D 5MN/100D 15MN/1M0 1HR/1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
└WBN-1-ZS -030-0054B -A Annulus exh Isln valve po	1-FCV -030-00 S SW	54/ZS2 -A 039 EA180-11302	729' 2 <b>"</b>	ANN	A / B A / B A / B A / B A / B	5MN/100D 5MN/100D 5MN/100D 15MN/1M0 1HR/1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL

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PREPARER / DATE D.R. SCONTRINO	8/22/86	KEN 6/8/90		
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•		6/8/90		

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BINDER NO. : WBNEQ-IZS Manufacturer : Namco Page 9 of 21

# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

			LOCATION-							
EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO	<u>). AZMITH</u> DDEL_NUMBER	ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	<u>EVENT</u>	SAFETY FUNCTION	<u></u>	
∽WBN-1-ZS -030-0057A -B Lower CNTMT EXH ISLN VALVE I	1-ZS -030-0057∕1 Pos SW eA	-B 035 180-11302	731'10"	ANN	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND CNTMT ISOLATION LIMIT SWITCH IS AND MUST BE MONI DURATION OF EACH	NOT FAIL UP SIGNAL. THIS A PAM VARIAB TORED FOR TH EVENT.	ON Le E
CWBN-1-ZS -030-0057B -B Lower CNTMT EXH ISLN VALVE F	1-ZS -030-0057/2 Pos SW EA	-B 035 180-12302	731' 4"	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND CNTMT ISOLATION LIMIT SWITCH IS AND MUST BE MONI DURATION OF EACH	NOT FAIL UP Signal. This A Pam Variab Tored For Th Event.	DN LE E R3
└WBN-1-ZS -030-0059A -A Incore Instr RM exh Isln val	1-ZS -030-0059∕1 VE POS SW EA	-A 115 180-12302	740° 9"	ANN	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND CNTMT ISOLATION LIMIT SWITCH IS AND MUST BE MONI DURATION OF EACH	NOT FAIL UP SIGNAL. THIS A PAM VARIAB TORED FOR TH EVENT.	ON LE
WBN-1-ZS -030-0059B -A Incore Instr RM EXH ISLN VAL	1-ZS -030-0059/2 VE POS SH EA	-A 115 180-11302	741'	ANN	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND CNTMT ISOLATION LIMIT SWITCH IS AND MUST BE MONI DURATION OF EACH	NOT FAIL UP Signal. This A pam variab Tored for th Event.	DN LE E
✓WBN-1-ZS -030-0060A -A INTERIM ABSCE ISLN VALVE POS	1-ZS -030-0060/1 SW EA	-A 180-11302	757'	A16	A/B	5MN/100D	L	MUST OPERATE AND UPON AUX BLDG IS	NOT FAIL Olation Sign	AL

PREPARER DATE D.R. SCONTRING 8/22/86 18 4/8/90 C X/ 6/8/90 CHECKED/DATE <u>R.N. BELL</u> BlzzIAL







#### WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

	EQIS NUMB	ER	<u></u> <u>UN</u>	IT DEV	CE ID	NO. MODEL N	AZMITH	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>çai</u>	OPER TIME	EVENT	SAFEI	Y FUNCTION	<u> </u>
L	WBN-1-ZS INTERIM AI	-030-0060B BSCE ISLN V/	-A 1- ALVE POS S	ZS -03 W	50-0060	/2 - EA180-1	-A 12302	757 •	A16	A/B	5MN/100D	L	MUST UPON	<b>OPERATE AND NOT Aux Bldg Isolat</b>	FAIL Ion Signal
د	WBN-1-ZS Purge Air	-030-0061A Exh unit A	-A 1- Suct Valv	FCV -03 E POS S	50-0061 5W	/ZS1 - EA180-1	-A 11302	713'	A06	A∕B	5MN/100D	L	MUST UPON	OPERATE AND NOT CNTMT ISOLATION	FAIL Signal
٤	WBN-1-ZS Purge Air	-030-0061B EXH UNIT A	-A 1- SUCT VALV	FCV -03 E Pos s	50-0061/ 5W	/ZS2 - EA180-1	A 2302	713'	A06	A/B	.5MN/100D	L	MUST Upon	OPERATE AND NOT CNTMT ISOLATION	FAIĽ Signal
L	WBN-1-ZS Purge Air	-030-0062A Exh unit b	-A 1- SUCT VALV	FCV -03 E POS S	50-0062 54 (	∕ZS1 - EA180-1	A 1302	713'	A06	A/B	5MN/100D	Ĺ	MUST Upon	OPERATE AND NOT CNTMT ISOLATION	FAIL Signal
v	WBN-1-ZS PURGE AIR	-030-0062B Exh unit b	SUCT VALV	FCV -03 E Pos s	0-0062 W	∕ZS2 - EA180-1	A 2302	713'	A06	A/B	5MN/100D	L	MUST Upon	OPERATE AND NOT CNTMT ISOLATION	FAIL Signal

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BINDER NO. : WBNEQ-IZS Manufacturer : Namco Page 11 of 21 ...

# WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID	NO. AZ Model Numbei	LOCATION- ZMITH <u>Elev(1)</u> R: <u>Contract</u>	RM/RAD CAT	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-ZS -030-0069A -B Interim Absce Isln Valve Po	1-ZS -030-0069 S SW	∕1 -B EA180-11302	757 <b>'</b>	A16 A/I	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0069B -B Interim Absce Isln Valve Po	1-ZS -030-0069 S SH	∕2 −B EA180-12302	757•	A16 A/I	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0296A -A Interim ISLN Damper Cdwe Po	1-FCO <b>-030-0296</b> S Switch	/ZS1 -A	(*)	A/ I	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
₩BN-1-ZS ~030-0296B -A Interim Isln Damper Cdwe Po	1-FCO -030-0296 S SWITCH	/ZS2 -A	(*)	ÂZI	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0297A -B Interim ISLN Damper CDWE Po	1-FCO - <b>030-0297</b> S SWITCH	2/ZS1 -B	(*)	A/1	3 5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL

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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS_NUMBER DESCRIPTION	UNIT_DEVICE_ID_NO.	AZMITH EL NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAT OPER TIME</u> (2)	EVENT	SAFETY FUNCTION
WBN-1-ZS -030-0297B -B Interim ISLN Damper CDWE Po	1-FCO <b>-030-0297/Z</b> S S SWITCH	:2 −B	(*)	A/B 5MN/100D [.]	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0298A -B Interim Isln Damper CDWE Po:	1-FCO <b>-030-0298∕Z</b> S S SWITCH	1 -B	(*)	A/B 5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0298B -B Interim Isln Damper CDWE Po:	1-FCO -030-0298/ZS 5 SWITCH	2 -B	(*)	A/B 5MN/100D	Ĺ	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0299A -A Intérim Isln Damper Cdwe Po:	1-FCO -030-0299/ZS S SWITCH	1 -A	(*)	A/B 5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL
WBN-1-ZS -030-0299B -A Interim Isln Damper CDWE Po	1-FCO -030-0299/ZS S SWITCH	2A	(*)	A/B 5MN/100D	L	MUST OPERATE AND NOT FAIL UPON AUX BLDG ISOLATION SIGNAL

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PREPARER/DATE D.R. SCONTRINO	9/22/86	JOH		
CHECKED/DATE R.N.BELL	9/22/86	12/12/89 WM		
		12/13/84		

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#### WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQIS_NUMBE DESCRIPTIO	R	UNIT DEVICE I	<u>D NO.</u> Model Numi	AZMITH BER	OCATI Elev( Contr	0N 1) ACT	<u>RM⁄RAD</u>	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
₩BN-1-ZS RB UNIT 1	-032-0080A Train a Isln	-A 1-FCV -032-00 Valve pos SW	80∕ZS1 -A EA180-1130	290 02	717'	5"	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FH/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.
₩BN-1-ZS RB UNIT 1	-032-0080B Train a Isln	-A 1-FCV -032-008 Valve pos SW	80/ZS2 -A EA180-1130	293 02	717"1	0 <b>n</b>	ANN	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE [:] B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.
✓WBN-1-ZS RB UNIT 1	-032-0102A TRAIN B ISLN	-B 1-FCV -032-010 VALVE POS SW	02/ZŞ1 -B EA180-1130	277 02	728'	4 11	ANN	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORNS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.
₩BN-1-ZS RB UNIT 1	-032-0102B TRAIN B ISLN	-B 1-FCV -032-010 VALVE POS SW	02∕ZS2 -B EA180-1130	27 <b>8</b> 02	728'	2"	ANN	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.
CWBN-1-ZS RB U1 NON	-032-0110A ESNTL ISLN V/	-A 1-FCV -032-01 NLVE POS SWITCH	l0∕ZS1 -A EA180-1130	290 02	718'	, n	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.

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# WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

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EQIS DESCR	NUMBI Iptic	ER DN			UNIT I	DEVICE I	D NO. MODEL	AZMITH NUMBER	ELEV	(1) RACT	<u>RM/RAD</u>	<u>CAI</u> (2)	OPER_TIME	<u>event</u>	SAFETY FUNCTION
WBN-]- RB U1	-ZS Non	-032-0 ESNTL	110B Isln V/	-A Alve	1-FCV POS SWI	-032-01) ITCH	LO/ZS2 EA180	-A 295 -11302	719 <b>'</b>	7 H	ANN	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.
WBN-1- RC LOG	-ZS DP 3	-062-0 Letdow	069A N FLOW	-A Pos	1-FCV SW	-062-006	9/ZS1 EA180-	-A 131 -11302	725'	7 <b>"</b>	LC .	A∕B	1HR/1M0	cv∕c	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
WBN-1- RC LOO	-ZS DP 3	-062-0 Letdow	069B N Flow	-A Pos	1-FCV รผ	-062-006	9/ZS2 EA180-	-A 131 -11302	725'	<b>7</b> "	LC	A∕ B	1HR/1M0	CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
WBN-1- RC LOC	-ŻS DP 3	-062-0 Letdow	070A N FLOW	-A Pos	1-FCV SN	-062-007	072S1 EA180-	-A 133 -12302	719'	11"	AC2	A∕ B	1HR/1MO	<u>.</u> CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
WBN-1- RC LOC	-ZS DP 3	-062-0 Letdow	070B N Flow	-A Pos	1-FCV SW	-062-007	0/ZS2 EA180-	-A 133 -12302	719•	8 "	AC2	A/B	1HR/1MO	cv∕c	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL

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# WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVICE ID NO. DESCRIPTION MODE	AZMITH L NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	<u>Cat</u> ( (2)	OPER TIME	<u>EVENT</u>	SAFETY FUNCTION
WBN-1-ZS -062-0077A -B 1-FCV -062-0077/ZS1 LTDN LINE ISLN VLV FLOW CONTROL POS SW	- B	(*)	A 1 A 1 A 1 A 1 A 1 A 1	100D 1M0 1M0 1M0 1M0 1M0	L RH⁄A CV⁄A AF AB	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -062-0077B -B 1-FCV -062-0077/ZS2 LTDN LINE ISLN VLV FLOW CONTROL POS SW	- B	(X)	A 1 A 1 A 1 A 1 A 1 A 1	100D 1M0 1M0 1M0 1M0	L RH/A CV/A AF AB	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -063-0003 -A 1-ZS -063-0003 SIS PMP RECIRC TO RWST VLV ZONE SWITCH	<b>-A</b>	(¥)	A/B 1	LWK/100D	L	MUST OPERATE AND NOT FAIL Upon SIS Recirc Signal
WBN-1-ZS -063-0004 -B 1-ZS -063-0004 SIS PMP RECIRC TO RWST VLV ZONE SWITCH	-B	(*)	A/B 1	LWK/100D	L	MUST OPREATE AND NOT FAIL Upon SIS Recirc Signal
WBN-1-ZS -063-0023A -B 1-FCV -063-0023/ZS1 SIS ACCUM FILL LINE ISLN VLV POS SWITCH	<b>- B</b>	<b>(X)</b>	A 1 A 1 A 1 A 1 A 1 A 1	L 0 0 D L M 0 L M 0 L M 0 L M 0 L M 0	L RH/A Ab AF/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.

PREPARER DATE D.R. SCONTRING 8/2/86 0/22/06 CHECKED/DATE______.

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#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER	UNIT DEVICE ID NO. Model	AZMITH	LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-ZS -063-0023B -B SIS ACCUM FILL LINE ISLN VLV	1-FCV -063-0023/ZS2 V POS SWITCH	-B	(*)	A A A A A	100D 1m0 1m0 1m0 1m0	L RH/A AB AF/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -063-0064A -A SIS ACCUM TANK N2 HDR INLET	1-FCV -063-0064/ZS1 VLV POS SW	- <b>A</b>	(*)	A A A A	100D 1m0 1m0 1m0 1m0 1m0	L RH/A AB AF/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -063-0064B -A SIS ACCUM TANK N2 HDR INLET	1-FCV -063-0064/ZS2 VLV POS SW	- <b>A</b>	(*)	A A A A	100D 1mo 1mo 1mo 1mo	L RH/A AB AF/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT. ${\cal R}$
WBN-1-ZS -063-0084A -B SIS CHECK VLV LEAK TEST ISLN	1-FCV -063-0084∕ZS1 V VLV POS SW	<b>- B</b>	(*)	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L RH/A Ab AF/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.
WBN-1-ZS -063-0084B -B SIS CHECK VLV LEAK TEST ISLN	1-FCV -063-0084/ZS2 I VLV POS SW	-B	(*)	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L RH/A Ab AF/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. THIS LIMIT SWITCH IS A PAM VARIABLE AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT.

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CHECKED/DATE R.N. BELL 8/22/86	CAT		
	6/8/90		

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BINDER NO. : WBNEQ-IZS -001 MANUFACTURER : NAMCO PAGE 17 OF 21

# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER	<u> </u>	IT DEVICE ID	NO.	AZMITH_	-LOCATION- ELEV(1)	<u>RM/RAD</u>	ÇAI	OPER TIME	EVENT	SAFETY	Y FUNCTION	
WBN-1-ZS -063 SIS PMP 18-B D	5-0175 -B 1- Disch Rwst Shtoff	-ZS -063-0175 F POS SW	-) UAKEr ⁻ V	<u>umæek</u> B	<u>CONIRACT</u> (*)		(2) A/B	1WK/100D	Ļ	MUST O Upon S	DPERATE AND NOT	FAIL IAL
WBN-2-ZS -065 CNTMT ANN VAC	-0005A -A 2- Fans Isln Dmpr V	FCO -065-0005 LV POS SW	/ZS1 -/	A	(¥)		A/B	5MN/100D	L	MUST Q Upon C	DPERATE AND NOT CNTMT ISOLATION	FAIL SIGNAL
WBN-2-ZS -065 Cntmt ann vac	-0005B -A 2- Fans Isln DMPR V	FCO -065-0005 LV POS SW	/ZS2 -1	N ¹	<b>(X)</b>		A/B	5MN/100D	L	MUST O Upon c	DPERATE AND NOT CNTMT ISOLATION	FAIL I SIGNAL
WBN-1-ZS -065 CNTMT ANN VAC	-0052A -A 1- Fans Isln Valve	FCV -065-0052 POS SW	/ZS1 -/ EA180-1]	502	757 •	A16	A/B	5MN/100D	L	MUST O UPON S	DPERATE AND NOT SI SIGNAL	FAIL
WBN-1-ZS -065 CNTMT ANN VAC	-0052B -A 1- Fans Isln Valve	FCV -065-0052 POS SW	/ZS2 -/ EA180-12	302	757•	A16	A/B	5MN/100D	L	MUST O Upon s	DPERATE AND NOT SI SIGNAL	FAIL

PREPARER/DATE D.R. Scontring 9/22/86 CHECKED/DATE P.N. Bell 9/22/86 <u>IDH</u> 11/8/90

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# WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

	EQIS NUMBER DESCRIPTION	UNIT_DEVICE_ID	NO. MQDEL	AZMITH_ NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAI</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
;	WBN-1-ZS -065-0053A -B Cntmt ann vac fans Isln val	1-FCV -065-0053 Ve Pos Sh	5/ZS1 EA180-	-B -11302	757•	A16	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL Upon SI Signal
	NBN-1-ZS -065-0053B -B CNTMT ANN VAC FANS ISLN VALV	1-FCV -065-0053 /e pos sw	ZS2 EA180-	-B -12302	757'	A16	A∕B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON SI SIGNAL
	WBN-1-ZS -068-0305A -A RCS FCV WDS N2 MAN TO PRT P(	1-ZS -068-0305 DS Switch	A	<b>-A</b>	(*)		A A A A A	100D Imo 1mo 1mo 1mo 1mo	L AF Ab RH/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL POSITION INDICATION IS A PAM VARIABLE AND MUST BE MONITORED FOR DURATION OF EACH EVENT.
	WBN-1-ZS -068-0305B -A RCS FCV WDS N2 MAN TO PRT P(	1-ZS -068-0305 )s shitch	B	<b>-A</b>	(*)		A A A A A	100D 1m0 1m0 1m0 1m0	L AF Ab RH/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL POSITION INDICATION IS A PAM VARIABLE AND MUST BE MONITORED FOR DURATION OF EACH EVENT.
	WBN-1-ZS -070-0085A -B Excess Letdown HTX Outlet VA	1-ZS -070-0085 LVE POS SW	A EA180-	-B 11302	713'	A28	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L CV/A RH/A AF/A AB/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.

KBN PREPARER/DATE D. R. Scontring 9/22/86 11/8/90 9/22/86 <u>JOK</u> 118/90 CHECKED/DATE_<u>R.N. Bell</u>

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# WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVI DESCRIPTION	CE ID NO. MODEL	AZMITH_ NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION
HBN-1-ZS -070-0085B -B 1-ZS -07 Excess Letdown HTX Outlet valve pos S	0-0085B SM EA180-	-B -12302	713	A28	A A A A	100D 1m0 1m0 1m0 1m0 1m0	L CV/A RH/A AF/A AB/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL. PERFORMS A PAM TYPE B FUNCTION & MUST BE MONITORED TO ENSURE CNTMT INTEGRITY IS MAINTAINED.
WBN-1-ZS -072-0040 -A 1-ZS -07 RHR SPRAY HDR A ISLN VLV STEM POS SWI	2-0040 TCH	-A	(*)		A∕B	1WK/100D	L	MUST NOT FAIL IN A MANNER THAT Would Adversely impact the Operation of the associated FCV.
WBN-1-ZS -072-0041 -B 1-ZS -07 RHR SPRAY HDR B ISLN VLV STEM POS SWI	2-0041 TCH	-B	(*)		A∕B	1WK/100D	L	MUST NOT FAIL IN A MANNER THAT Would Adversely impact the Operation of the associated FCV.
WBN-1-ZS -077-0019A -A 1-ZS -07 RCDT TO VENT HDR FCV POS SWITCH	7-0019A	-A	(*)	·	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L AF Ab RH/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL POSITION INDICATION IS A PAM VARIABLE AND MUST BE MONITORED FOR DURATION OF EACH EVENT.
NBN-1-ZS -077-0019B -A 1-ZS -07 RCDT TO VENT HDR FCV POS SWITCH	7-00198	-A	(*)		A A A A A	1 0 0 D 1 MO 1 MO 1 MO 1 MO 1 MO	L AF Ab RH/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL POSITION INDICATION IS A PAM VARIABLE AND MUST BE MONITORED FOR DURATION OF EVENT.

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 PREPARER/DATE
 D.R. Scontring
 9/22/86
 1/8/90

 CHECKED/DATE
 R.N.Bell
 9/22/86
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# WATITS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT	DEVICE ID NO. MODE	AZMITH_ L_NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAI</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-ZS -077-0020A -A RCDT N2 Supply FCV Pos SW	1-ZS ITCH	-077-0020A	-A	(*)	A A A A	100D 1mo 1mo 1mo 1mo	L AF Ab RH/A CV/A	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL POSITION INDICATION IS A PAM VARIABLE AND MUST BE MONITORED FOR DURATION OF EACH EVENT.
WBN-1-ZS -077-0020B -A RCDT N2 SUPPLY FCV POS SW	1-ZS ITCH	-077-0020B	-A	(*)	A A A A	100D 1m0 1m0 1m0 1m0	L AF Ab RH/A CV/A	MUST OPERATE AND FAIL UPON CNTMT ISOLATION SIGNAL POSITION INDICATION IS A PAM VERIABLE AND MUST BE MONITORED FOR DURATION OF EACH EVENT.
WBN-1-ZS -081-0012A -A PW-RCS press relf tkrcp s	1-FCV Tanpipes	-081-0012/ZS1 POS SW	-A	(*)	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
HBN-1-ZS -081-0012B -A PW-RCS PRESS RELF TKRCP S	1-FCV TANPIPES	-081-0012/ZS2 POS SW	-A	(*)	A/B	5MN/100D	L	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
WBN-1-ZS -090-0107 -A CNTMT BLDG LWR COMPT MON	1-FCV Isln Vlv	-090-0107/ZS Pos SW EA18	-A 294 0-11302	740'10" ANN	A / B A / B A / B A / B A / B	5MN/100D 5MN/100D 5MN/100D 15MN/1M0 15MN/1M0 1HR/1M0	L MS/C FW/C RH/C CV/C	MUST OPERATE AND NOT FAIL UPON CNTMT ISOLATION SIGNAL
				PREPARER/DATE	D. R.	Scontrino	9/22/	R_4_ R R KOV W/8/90

PREPARER/DATE D.R. Scontring 9/22/86

CHECKED/DATE_R.N. Bell 9/22/86

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#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT	DEVICE ID NO. AZMITH	LOCATION ELEV(1) RM/RAD	CAT OPER TIME EVEN	I SAFETY FUNCTION	
DESCRIPTION	MODEL NUMBER	CONTRACT	(2)		
WBN-1-ZS -090-0111 -A 1-FC CNTMT BLDG LWR COMPT MON ISLN VLV	V -090-0111/ZS -A 293 V POS SW EA180-12302	740'10" ANN	A/B 5MN/100D L A/B 5MN/100D MS/C A/B 5MN/100D FW/C A/B 15MN/1M0 RH/C A/B 1HR/1M0 CV/C	MUST OPERATE AND NOT Upon CNTMT ISOLATION	FAIL Signal
WBN-1-ZS -090-0113 -A 1-FC CNTMT BLDG UP COMPT MON ISLN VLV	V −090−0113⁄ZS −A 290 Pos SW EA180−11302	740' 9" ANN	A/B 5MN/100D L A/B 5MN/100D MS/C A/B 5MN/100D FW/C A/B 15MN/1M0 RH/C A/B 1HR/1M0 CV/C	MUST OPERATE AND NOT Upon CNTMT ISOLATION	FAIL SIGNAL
WBN-1-ZS -090-0117 -A 1-FC CNTMT BLDG UP COMPT MON ISLN VLV	V -090-0117/ZS -A 290 Pos SW EA180-12302	740' 5" ANN	A/B 5MN/100D L A/B 5MN/100D MS/C A/B 5MN/100D FW/C A/B 15MN/1M0 RH/C A/B 1HR/1M0 CV/C	MUST OPERATE AND NOT Upon CNTMT ISOLATION	FAIL Signal

PREPARER/DATE D.R. Scontring 9/22/86 1/8/90 9/22/86 <u>JOH</u> 11/8/90 CHECKED/DATE R.N. Bell

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WBNEQ-IZS-001

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Pages <u>A-22 R1</u> thru <u>A-27 R1</u> were deleted per revision <u>2</u>.

WBEP-0158Q

BINDER NO. WBNEQ-IZS-001 PLANT WB	NUNIT(S)1SHEET _1OF_1
BINDER TITLE EA 180 Series COMPU	RR TEDR1JOH DATE 6-9-89
After 7/30/80 CHECK	ED R1 Hon DATE 6/9/89

# TAB A

# NOTES

- 1. Elevations shown are <u>Actual</u> elevations for equipment located in the Reactor Building and <u>Floor</u> elevations for equipment located outside the Reactor Building. Actual elevations for all equipment are documented in TAB F. Elevations shown as (*) are covered by SCR WBNEEB 8578 and are documented as Open Item No. 2 of this binder.
- 2. See Page B-1A for source of Category and Operating Time assignments.



	6/9/89 //
A. DOCU	<u>MENTATION</u> (See Note)
Equi	pment Description <u>Limit Switch</u>
Vend	or/Manufacturer <u>NAMCO</u>
Equi	pment Model No.(s) <u>See TAB A</u>
	· · · · · · · · · · · · · · · · · · ·
QUAL	IFICATION REPORTS (See Note)
(1)	Title/Number/Revision Qualification of EA RIMS B70 851021 10
	No. OTR 105. Rev. 4 (TAB D) DATE 1/9/84
(2)	Title/Number/Revision Qualification of EA_RIMS_B26_890516_92
	<u>No. OTR 155, Rev. 0 (TAB D)</u> DATE 10/5/87
(3)	Title/Number/Revision
	DATE
OTHE	R (ANALYSIS, VENDOR DATA, ETC.)
(4)	Deleted per revision 4.
(5)	Material Aging and Accident Degradation Equivalency Calculation - WAC-427 (B44 901011 802) (TAB C-4)
(6)	Vendor telecon: TVA (L.P. Woodley) and Namco (John R. Bendokaitis) on 10/3/85 - See TAB E(1)
(7)	Vendor telecon: TVA (L.P. Woodley) and Namco (John R. Bendokaitis) on 10/22/85 - See TAB E(2)
(8)	Vendor telecon: TVA (L.P. Woodley) and Namco (John R. Bendokaitis) on 11/4/85 - See TAB E(3)
(9)	TI-RPS-32 R2 (B45 860407 237), Shield Design Review and Equipment Qualification Study

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DINDER NO.	WBNEQ-IZS-001 PLANT	WBN	UNIT(S	5)1	SHEI	ET <u>la</u> (	)F_3
					R	<u>4 R</u>	
BINDER TIT	LE <u>EA 180 Series</u>	COMPUTED	R1 JDH	DATE	<u>6/15/89</u>	KBN	
Limit Swit	ches Manufactured		•			יי /90	
<u>After 7/30</u>	/80	CHECKED	R1 HDR	DATE g	<u>6/16/89</u>	JDH_	
						11/7/90	
A. DOCUME	NTATION						
OTHER	(ANALYSIS, VENDOR DAT	A, ETC.) (	Continue	ed)			
(10)	WBNNAL3-022 R0 (B45 86)	1314 2391	Pine (1	, 1966 91	nd Pine		
()	Shaft 100 Day Total In	tegrated I	)ose	lase a	na ripe		
(11)	WBNTSR-051 R0 (B26 891)	129 202).	Reductio	on of 1	Beta Dos	se by	
	Sheet Metal	••					
(12)	TVA Environmental Draw:	ing 47E235	5-42 R2,	DCA P-	-04104-(	)2-1,	
		-03-0	, -05-0,	and D	CA S-097	15-02-0	),
		-03-0	-04-0,	-05-0	, -13-0,	-14-0	
		-15-0					
(13)	TVA Environmental Draw:	ing 47E235	5-44 Rl				•
(14)	TVA Environmental Draw:	ing 47E235	5-48 R3				
(15)	TVA Environmental Draw:	ing 47E235	5-56 Rl				
(16)	TVA Environmental Draw:	ing 47E235	5-61 Rl			•	
(17)	TVA Environmental Draw:	ing 47E235	5-76 R3				
(18)	TVA Environmental Draw:	ing 47E235	5-78 R3				
	Category and Operating	Times		RIMS 1	<u>. 01</u>		
(19)	System 1 (WBNOSCA_00)	4 5111	סופ	00061	10 959		1
(20)	System 30 (WBNOSCA-00)	R P16)	B24		12 200		
(21)	System 32 (WBNOSG4-01)	) RA)	B26	50073 5 201 <i>21</i>	15 201		1
(22)	System 62 (WBNOSG4-01)	3 R16)	B20		11 501		ī
(23)	System 63 (WBNOSG4-014	1 R12)	B26	00101 00071	13 212		
(24)	System 65 (WBNOSG4-01)	5 R10	B26	90073	10 226		
(25)	System 68 (WBNOSG4-017	7 R11)	B18	90061	220		I
(26)	System 70 (WBNOSG4-018	8 R14)	B26	90061	LZ 202		I
(27)	System 72 (WBNOSG4-019	R9)	B26	90071			
(28)	System 77 (WBNOSG4-02)	L R5)	B18	90061	2 251		
(29)	System 81 (WBNOSG4-023	B R3)	BAS	85112	7 210		I
(30)	System 90 (WBNOSG4-026	5 R7)	R45	87022	27 426		
(31)	U2 for U1 (WBNOSG4-040	) R8)	B26	90062	26 224		1
(32)	WBNNAL3-031 R1 (B45 88	30826 235)	EGTS R	200m 10	0 Day L	OCA dos	ا م
(33)	WBNTSR-018 RO (B26 89) EGTS filter train	106 203),	Dose Gr	id arc	ound the		
(34)	QIR MNMWBN90032 RO (B2	26 900226	251)				1
(35)	QIR MNMWBN90057 RO (B2	6 900515	250)				
			2307				i
Note:	Documents listed above	e are used	through	out th	is bind	er for	
	Information Manager	n. The r	evision	ievels	and Re	cords &	:
	above pool and he	. system (	KIMS) nu	mbers,	as lis	ted	
	This liceing include	eated in	other se	ctions	of the	binder	•
		OTIV PRAG	e docume	nts wh	lich are		
	appential to molify					-	
	essential to qualifica	tion and	accordin	gly sh	ould no	t be	

INE	DER TITLE EA 180 Series COMPUTED DRS DATE 9/16/86 KBN XBN
imi	it Switches Manufactured 6/14/90 "/6/
<u>.fte</u>	<u>er 7/30/80</u> CHECKED <u>RNB</u> DATE <u>9/16/86 CDH</u> <u>JD<del>//</del></u> 6/14/90 ////
	0, 1, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7,
Β.	<u>CONCLUSION OF REVIEW</u> (Check only one block)
	<u>X</u> Equipment Qualified
	Equipment Satisfies All Requirements Except Qualified
	Life of Justification of Replacement Schedule
	Equipment Qualification Not Established by Documentation
	Equipment Not Qualified Based on Test Failures
	OPEN ITEMS AND QUALIFICATION DEFICIENCIES Equipment is qualified
	pending resolution of open item noted in the open items list.
	1. SCR WBNEEB8578 R5 - Change out unqualified switches
	2 DCN P_06660_4 M_07532 A M 07000 A M 08055 A M 08061 A
	2,, M, M, M, M, M, M, M, M
	Add conduit seals
	COMMENIS/RECOMMENDATIONS <u>The required operating environments</u> ,
	normal and accident, have been reviewed for each switch location
	identified in TAB A. All switches are qualified to the worst case
	combination of these environmental parameters. This includes
	consideration of neak levels and profiles
	consideration of peak levels and profiles.
	Approximately 60 standard and short travel switches are being
	changed out per ECN 6613 (Unit 1) and ECN 6614 (Unit 2 for Unit 1
	operation). The documentation for the short travel switches is
	presently referenced in the bindow over theuch they are not use
	presentry referenced in the binder even though they are not yet
	included in the binder.

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BIN	DER TITLE EA180 SERIES LIMIT COMPUTED DIL DATE 6/13/00 R	R
SWIT	CHES MANUFACTURED AFTER 7/30/80 CHECKED RANG DATE 6/27/86	. <u></u>
c.'	QUALIFICATION CRITERIA	
	Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate Which Criteria is Applicable):	
	X Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE-323-1974)	
	Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of 1E Bulletin No. 79-01B (IEEE-323-1971) (DOR Guidelines Applicable to only BFN)	
	JUSTIFICATION/COMMENTS None	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	
	IEEE Std 323-1974 IEEE Std 344-1975	
	IEEE Std 382-1972 (Pressurized Water Reactor Portion Only)	

- 1	BIND	DER NOWBNEQ-12S-001 PLANT WEN UNIT(S) 1 SHEET 4 OF 3
	SWIT	CHES MANUFACTURED AFTER 7/30/80 CHECKED RAB DATE 4/27/84
	D.	QUALIFICATION METHODOLOGY
		X Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
		X Test of Similar Items with Supporting Analysis
		Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
		Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis
		JUSTIFICATION/COMMENTS This test provides generic group qualifi-
		cation for Model EA180 Series limit switches. The Model EA180-11302
		selected for test purposes is identical to some of the equipment
) /		qualified by this binder. TAB C(5) contains a similarity evalua-
		tion which addresses the remainder of the equipment.
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	<u></u>	<u></u>						
E.	EQUI	PMENT DESCRIPTION						
	Is t plar	he equipment identifi t equipment which req	ed in the qualif. Juires qualificat	ication report io ion (yes/no/NA)?	lentical to the <u>Yes</u>			
			<u>Plant Device</u>	Qualification Document	<u>Reference</u>			
	(1)	Equipment Type	Limit Switch	<u>Limit Switch</u>	TAB D, pp. 3-1.3-6			
	(2)	Manufacturer	Namco	Namco	TAB D, pp. 3-1,3-6			
	(3)	Model Numb <u>er(</u> s)	<u>See TAB A</u>	<u>EA180-11302</u>	TAB D, pp. 3-1.3-6			
					。			
	(4)	Serial Number(s)	See Comment	See Comment	TAB D, p. 3-10			
	(5)	Identify Component- Unique checksheet attached:						
	JUST	FIFICATION/COMMENTS	<u>Chese limit switc</u>	<u>hes do not have</u>	serial			
	num	pers but are provided	with date codes	per the manufact	urer's date_			
	code system described in TAB D, page 3-10 of the test report. Field							
	Ver	ification (TAB F) has	determined that	all limit switch	es covered			
	<u>in 1</u>	<u>FAB A have date codes</u>	after July 30, 1	980, and are the	<u>refore</u>			
	cove	ered by QTR 105. See	TAB C(5) for sim	ilarity evaluati	<u>on.</u>			

EQP025.52

B	INDER	NO. WB	NEQ-IZS-001	PLANT	WBN		IT(S)	1 S	HEET _	6	0F <u>37</u>
									R <u>    1    </u>	R	4
В	INDER	TITLE_	EA 180 Series	3	COMPUTED	DRS	DATE	<u>6/26/</u>	<u>86_JDH</u>	<u> </u>	<u>KBN</u>
L	<u>imit S</u>	Switche	s Manufacture	11					5/17	/89	11/6/90
A	fter 7	7/30/80			CHECKED_	RNB	DATE	<u>6/27/</u>	<u>86 HDR</u>	<u> </u>	JOH
_									6/9/	89	11/7/90

# F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification documentation and/or evaluation and reference the source. Is the interface a requirement for our application (Yes/No)? (Note below.) If yes, enter requirement in QMDS, if no, provide justification.

<u>Interface</u>	Identify Interface	Plant Requirement? (Yes/No)	Reference Test Report
Mounting Bolts	NA	NA	NA
External Process Connections	<u>NA</u>	<u>NA</u>	<u>NA</u>
Electrical Connections	<u>NA</u>	<u>NA</u>	<u>NA</u>
Conduit Seals	See Comment (1)	Yes	<u>TAB D. p 4-2</u>
Connector Seals	<u>NA</u>	<u>NA</u>	<u>NA</u>
Orientation	None	NA	NA
Physical Configuration	None	<u>NA</u>	<u>NA</u>
Other	See Comments (2)	Yes	<u>NA</u>

#### JUSTIFICATION/COMMENTS

(1)	For installation instruction refer to EA 189-90008, TAB D.	
	page 4-2 of OTR 105. The conduit entrance must be sealed in	
	such a way as to maintain the switch integrity under required	
	service condition (see OMDS (TAB G) for conduit seal require-	R4
	ments).	1

(2) Although, it was not considered part of the qualification test, an operating lever is required for proper operation of the switch. The lever and roller should be of metallic construction. Nylon rollers are not acceptable and are controlled through TVA's maintenance program (See TAB G).

	ER TITLE _	EA180 SERIES LIMIT COMPUTE FACTURED AFTER 7/30/80 CHECKED	DAS DATE	6/13 Re R R 6/27/86
G.	TEST SEQ	<u>UENCE</u>		
	(1) Tes acc (ye	t Sequence: Was the test sequenc ident environment in accordance w s/no/NA)? (note below)	e established ( ith IEEE-323 () <u>Yes/No/NA</u>	to simulate the 74), paragraph 6.3.2 <u>Reference</u>
	(a)	Equipment inspected for damage	Yes	TAB D, D. 10-6
	(Ъ)	Baseline performance measurements taken	Yes	TAB D, p.10-6
	(c)	Equipment aged:	Yes	TAB D,
		Radiation	<u>Yes</u>	TAB D, 
		Wear	Yes	TAB D, 
	(d)	Vibration/seismic testing conducted	Yes	TAB D, 
	(e)	Design basis event (DBE) exposure	Yes	TAB D. P10-8
	(f)	Post-DBE exposure	Yes	TAB D, D.10-9
	(g)	Final inspection and disassembly	Yes	TAB D, 
	(2) Was des	the same piece of equipment used cribed in item (1) above (yes/no/	throughout the NA)? <u>Yes - See</u>	test sequence Comment (2)
	(3) Have been (Ref	e the test equipment, test equipm n appropriately documented (yes/n ference <u>TAB D, page 10-61</u> ).	ent accuracies o/NA)? <u>No - See</u>	and calibration data <u>Comment (1)</u>
			•	

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В	INDER NO.	WBNEQ-IZS-001 PLANT_WBN_UNIT(S)	S	HEET <u>8</u> 0
	INDER TITI	E EA180 SERIES LIMIT COMPLITED	DATE 1/8/	R R
~   s	WITCHES N	ANUFACTURED AFTER 7/30/80 OUEOWED ONA	lala	u
			DATE 7/7/0	<u> </u>
		IFICATION /COMMENTS (1) Togt or interest and cali	ibration dat	
	00011	(1) lest equipment and cars		es were
	reco	rded; nowever, test equipment accuracies were	not documen	ted in the
	test	report. (2) The recorded seismic test in TAP	3 D, App. B	p. 10-20
	(QTR	105) is from a different.Model EA180 switch;	however, fu	<u>11 frag-</u>
	ility	y testing was performed on the switch used the	roughout the	test
	seque	ence (Ref TAB D, p. 10-7).		
	H. AGII	NG		
	(1)	Was aging considered in the qualification pr	ogram	
		(Yes/no/NA)? Yes (Reference TAB D, page )	10-6).	
		JUSTIFICATION/COMMENTS None	· _ · _ · · · · · · · · · · · ·	
1				•
	· (2)			
	(2)	were the following effects considered in the	e aging prog	ram:
	(2)	Were the following effects considered in the <u>Aging Effect</u>	e aging prog Yes/No/NA	ram: <u>Reference</u>
-	(2)	Were the following effects considered in the <u>Aging Effect</u>	e aging prog <u>Yes/No/NA</u>	ram: <u>Reference</u> TAB D,
	(2)	Were the following effects considered in the <u>Aging Effect</u> Thermal aging	e aging prog Yes/No/NA Yes	ram: <u>Reference</u> TAB D, <u>p. 10-6</u>
-	(2)	Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure	e aging prog <u>Yes/No/NA</u> <u>Yes</u> Yes	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u>
	(2)	Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D,
-	(2)	Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u>
-	(2)	<pre>Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging Operational (electrical/mechanical/process) stress aging</pre>	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-6</u>
	(2)	<pre>were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging Operational (electrical/mechanical/process) stress aging JUSTIFICATION/COMMENTS None</pre>	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-6</u>
	(2)	<pre>were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging Operational (electrical/mechanical/process) stress aging JUSTIFICATION/COMMENTS <u>None</u></pre>	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-6</u>
	(2)	Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging Operational (electrical/mechanical/process) stress aging JUSTIFICATION/COMMENTS <u>None</u> Were all known synergistic effects which are	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-6</u>
	(2)	<pre>Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging Operational (electrical/mechanical/process) stress aging JUSTIFICATION/COMMENTS <u>None</u> Were all known synergistic effects which are significant effect on equipment performance</pre>	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-6</u> o have a in the aging
	(2)	<pre>Were the following effects considered in the <u>Aging Effect</u> Thermal aging Radiation exposure Vibration (non-seismic) aging Operational (electrical/mechanical/process) stress aging JUSTIFICATION/COMMENTS <u>None</u> Were all known synergistic effects which are significant effect on equipment performance program (yes/no/NA)? <u>Yes</u> (Reference <u>See TAU</u>)</pre>	e aging prog <u>Yes/No/NA</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Ye</u>	ram: <u>Reference</u> TAB D, <u>p. 10-6</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-7</u> TAB D, <u>p. 10-6</u> o have a in the aging
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Lim:	DER T <u>it Sw</u>	ITLE_ itche	<u>EA 180 Serie</u> <u>s Manufacture</u>	es COMPUTEDDRS ed	_ DATE <u>6/13</u>	<u>/86_70#</u>
Afte	er 7/	30/80		CHECKED <u>RNB</u>	_ DATE <u>6/27</u>	186 Hor 6/9/59
н.	<u>AGI</u>	NG (C	ontinued)			
		JUS	TIFICATION/CO	MMENTS <u>See TAB C 18</u>		
	(4)	The	rmal Aging:			
		(a)	Was thermal (Yes/No/NA)	aging considered in t )? <u>Yes</u> (Reference:	he qualific <u>TAB D, pag</u>	ation program <u>e 10-6</u> ).
		(b)	Were the mat identified i (Reference:	cerials susceptible to in the qualification pro TAB D, page 4-7	thermal agi ogram (Yes/	ng degradatio No/NA)? <u>Yes</u> ).
			JUSTIFICATIO	N/COMMENTS None		
		(c)	Was the basi qualificatio (Reference:	is for thermal aging id on program (Yes/No/NA)? <u>TAB D, page 4-6, 4-7</u>	entified in <u>Yes</u>	the).
			JUSTIFICATIO	N/COMMENTS None		
		(d)	Was the agin of time and program (Yes page 4-6, 4-	ng acceleration rate ju temperature identified s/No/NA)? <u>Yes</u> (Refere -7	stified and in the qua ence: <u>TAB</u>	the paramete lification <u>D;                                    </u>
			Parameter	<u>Plant Maximum Normal</u>	Test	<u>Equivalent</u>
			Temperature Time	54.4°C (55°C) 40 Years	<u>120°</u> <u>432.</u> 5 hrs	<u>55°C</u> 5 Years
			JUSTIFICATIC <u>tended to 40</u> defined in F	DN/COMMENTS <u>The qualify</u> by years through periodic CA189-90051 TAB D, (Page	ied life ca c refurbish e 4-3).	n be ex- ment as
		(e)	Was the Arrh (Yes/No/NA)?	nenius methodolgy used f Yes (Reference: <u>TA</u>	for acceler AB D, page	ated aging 4-7).
			JUSTIFICATIO	N/COMMENTS None		
		(f)	If activation aging parameters of the techn	on energies were used for eters, are they properly dical data (Yes/No/NA)?	or determin v reference <u>Yes</u>	ing accelerate d to the source

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	MNOFA	<u>CTURED AFTER 7/30/80</u> CHECKED DATE 6/27/86
H. AGI	<u>NG</u> (C	Continued)
· .		JUSTIFICATION/COMMENTS None
• •	(g)	If a regression line was used for determining accelerated agin parameters, are test points or failure modes identified on the line (yes/no/NA)? <u>NA</u> (Reference <u>NA</u> )
		JUSTIFICATION/COMMENTS None
	(h)	Was the equipment operated during the thermal aging (yes/no/NA)? <u>No</u> (Reference <u>TAB D, pp. 11-13, 11-14</u> ).
		JUSTIFICATION/COMMENTS <u>Performance testing conducted before</u> and after aging test adequately provided a basis for aging degradation evaluation
(5)	Radi	ation Aging Exposure:
	(a)	Was radiaton aging exposure considered in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 10-7</u> ).
		JUSTIFICATION/COMMENTS None
	(b)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference <u>NA</u> ).
		JUSTIFICATION/COMMENTS Assembled test specimen irradiated
		to 204 megarads.
	(c)	Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes
		(Reference $\underline{IAB D}$ , p. 5-3 ).
		JUSTIFICATION/COMMENTS None

TVA 19537 (OE-3-86)

EQP025.52

After 7/30/	.E <u>E/</u> :hes N '80	A 180 Series COMPUTED DRS Manufactured CHECKED RNB	DATE <u>6/13/86</u> 5/17/81 DATE <u>6/27/86</u> 6/9/87
H. <u>AGING</u>	(Cont	tinued)	······································
. (	(d) a 1	Is the radiation test exposure do acceptable (Yes/No/NA)? <u>Yes</u> ( <u>pp. 11-21, 10-7</u>	se and dose rate Reference: <u>TAB D.</u>
	]	Plant normal ambient radiation dose (rd)	2 x 10 (worst case
		Test exposure dose (rd)	$204 \times 10^{6}$
	1	Test exposure dose rate (rd/hr)	$0.91 \times 10^6$
	]	Test exposure source type (e.g., Co-60 gamma)	<u>Co-60 gamma</u>
		JUSTIFICATION/COMMENTS None	
(6) V	ibrat	tion (non-seismic) Aging:	
	a) V r (	Nere the effects of non-seismic w normal and abnormal operation add qualification program ¹ <u>Yes</u> p. 10-7	ibration induced dur ressed in the (Reference: <u>TAB D</u> ,
		JUSTIFICATION/COMMENTS Plant ind	uced vibration
	<u> </u>	simulation 1 x 10 [°] cycles @100Hz a	t 0.75 g's per QTR 1
	]	<u>TAB D. p. 4-4, Section 4.5.5.</u>	
(	b) V j	Was the basis for vibration aging in the qualification program (Yes (Reference: <u>TAB D, p. 5-3, Secti</u>	identified and just /No/NA)? <u>Yes</u> on 5,4
		USTIFICATION/COMMENTS None	
		ional Stress Aging:	
(7) Op	erati	tonal buless aging.	
(7) Op (a	oerat: ) We or or ()	ere the effects of electrical, me perational stresses induced durin peration adressed in the qualific (es/No/NA)? <u>Yes</u> (Reference: <u>I</u>	chanical, and proces g normal and abnorma ation program AB D, p. 10-6
(7) Op (a	perat: ) We of () JU	ere the effects of electrical, me perational stresses induced durin peration adressed in the qualific (es/No/NA)? <u>Yes</u> (Reference: <u>I</u> USTIFICATION/COMMENTS <u>None</u>	chanical, and proces g normal and abnorma ation program AB D, p. 10-6

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BINDER N	NO. <u>WBNEQ-IZS-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>12</u> C
BINDER 7	R <u>1</u> R_ IITLE EA 180 Series COMPUTED DRS DATE 6/13/86 JDH
Limit Sv	vitches Manufactured 5//7/89
AILEI //	JUISO CHECKED KND DATE 0/2/100 JP/C
H. AGIN	IG (Continued)
	(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>NA</u>
	JUSTIFICATION/COMMENTS See Section P for additional
	discussion.
(8).	Was the qualified life of the equipment and its basis defined in the qualification program (Yes/No/NA)? <u>Yes - See next</u> sheet for discussion.
	(Reference: IND D. DD 4-0 Childugh 4-12
	Qualified life (Document in QMDS) 40 years*
	.JUSTIFICATION/COMMENTS *Through periodic refurbishment as
	defined in EA 190 00051 (TAP D = $(-2)$ )
	derined in EA 189-90051 (IAB D, p 4-5).
. (9)	Were replacement intervals for the equipment or its component defined in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, pp 4-3.1, 4-3.2</u>
	•
	JUSTIFICATION/COMMENTS None

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BINDER NO.WBNEQ-IZS-001 PLANT W BINDER TITLE EA180 SERIES LIMIT SWITCHES MANUFACTURED AFTER 7/30/80	BN UNIT(S) 1 SHEET 13 OF 37 COMPUTED DATE $6/13/86^{R}$ R R R R R R R R R R R R R R R R R R
QUALIFIED LIFE (H8)	
The qualified life for all e	quipment covered by this binder is 40 years
through periodic refurbishme	nt. The refurbishment schedule was determined
by NAMCO's use of a very con	servative_0.8eV_activation_energyFigure_8
on page 4-12 of the test rep	ort (TAB D) shows the qualified life based on
on a 0.8eV activation energy	y for the various ambient temperatures. The
scheduled maintenance service	e times in TAB D, page 4-3.1 and 4-3.2 (EA 189-
90051) comes directly from t	his Arrhenius curve and are shown below:
Max. Normal Ambient	Service_Time
104°F	20.6 years
110°F	15 years
120°F	9 years
130°F	5.5 years

The QMDS section found in TAB G, will document the limit switches which require refurbishment and the appropriate schedule.

PAGE <u>B-13</u>

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EQP025.52

WBNEQ-12S-001 W	BN	1 (UT(C)	CUE	14 T OF
EA180 SERIES LIMIT	Ui	NII(5)		R R
BINDER TITLE	COMPUTED	0K5_0	ATE 6/3/86	
SWIICHES MANUFACIUKED AFIEK //JU/O	CHECKED	Riff D	ATE 4/27/86	
I. MATERIALS ANALYSIS				
Identification of Materials S Radiation Degradation and Agin Materials Analysis)	usceptible to ng (Use Secti	Significa on C of EQ	nt Thermal an C Binder for	d/or Detailed
Material/Property/Function	Radiation <u>n Threshold</u>	Reference	Activation Energy	Reference
Ethylene/O-Ring			0 <b>.8eV</b>	TAB D,
(a) <u>Propylene/Shaft Seal</u>	<u>NA</u>	<u>NA</u>	<u>See Comment</u>	<u>p.4-9</u>
(b) <u>Silicone Rubber/Gasket</u>	<u>NA</u>	<u>NA</u>	1.14eV See Comment	TAB D, <u>p.4-9</u>
(c) <u>Grease/Lubricant</u>	<u>NA</u>	NA	Unknown <u>See Comment</u>	TAB D, <u>p.4-8</u>
Asbestos Filled Phenolic/ (d) <u>Contact Carrier and Block</u>	<u>NA</u>	•	(.99eV) 0.96eV <u>See_Comment</u>	TAB D, <u>p.4-8</u>
(e) <u>Aromatic Ether Based Oil/</u> Lubricant	<u>NA</u>	<u>NA</u>	Unknown <u>See Comment</u>	TAB D, p.4-8
JUSTIFICATION/COMMENTS <u>Name</u> the elastomer portions of the life of the EA180 Series lim:	o has assumed e limit switc it_switch (mf	an activa h. Based g after 7/	tion energy o on 0.8eV, the 80) is 5.3 ye	f 0.8eV for qualified
The qualified life can be evo	tended to 40	woore thro	uch poriodic	mefuntist
<u></u>	cended to 40	years thro	ugn periodic_	refurbisn-
ment as defined by EA189-900	51 (TAB D, p.	<u>4-3). Th</u>	e 0.8eV assum	ed
activation energy for Ethyle	ne Propylene	<u>is conside</u>	red to be con	servative
based on a review of the Dig:	<u>ital Data Bas</u>	e, other t	est_reports.	& EPRI
<u>NP-1558 (See TAB C(8)). Mari</u>	tin Marietta	indicates	an activation	energy
of 1.14 for silicones (TAB D	p. 4-9) tha	t have bee	n tested for	432.5 hours
				AND

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EQP025,52

BINDER NO. WBNEQ-IZS-001 PLANT WBN UNIT(S) 1 SHEET 15 OF 37 BINDER TITLE EAL 80 SERIES LIMIT COMPUTED DATE 645/86 R ____ SWITCHES MANUFACTURED AFTER 7/30/80 CHECKED ATE 427/86 I. MATERIALS ANALYSIS (Continued) withstanding both the required normal and abnormal conditions over the life of the plant. An activation energy for the lubricant was not required since greases are designed for high temperature applications and are typically rated for temperatures of at least 250 °F (TAB D, p. 4-7). The qualified life of the lubricants will be controlled through maintenance procedures. In QTR 105 Namco has assigned an activation energy of 0.96eV to Asbestos-filled Phenolic (thermoset plastic). Based on an ambient temperature of 55°C and the test performed in QTR 105, the resultant life of the phenolic would be as follows:  $[\emptyset/K (1/T_1 - 1/T_2)]$ (Arrhenius EQ.)  $t_1 = t_2 \exp$ Where  $t_1 = Life$  $t_2$  = Test Time = 432.5 hours  $\emptyset$  = Activation energy = 0.96eV k = Boltzmann's Constant = 8.617x10⁻⁵ T₁ = Ambient Temp = 55 °C =328 °K T = Test Temp = 120 °C = 393 °K  $t_1 = 13.58$  years @ 55°C More recent IEEE-323-74 testing of this material, as documented in QTR 140 (See 11/4/85 telecon in TAB E(3)), demonstrated 1049 hours @ 120°C at an assigned activation energy of 0.99eV (See materials analysis in TAB C(17)). Using the above Arrhenius equation, the equivalent life would be 39 years @55°C. Therefore, the 20-year replacement schedule recommended by Namco (See maintenance instruction in TAB H) for switches exposed to temperatures greater than 50°C is reasonable and conservative. PAGE B.15

TVA 19537 (OE-3-86)

EQP025.52

BINDER NO. WBNEQ-IZS-001 PLAN	NT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>15a</u> OF <u>37</u>	<u>,</u>
BINDER TITLE EA 180 Series	R R COMPUTEDR1 <i>JD#</i> DATE <i>5/25/89</i>	
After 7/30/80	CHECKEDR13/DR_ DATE 6/9/89	

I. <u>MATERIALS ANALYSIS</u> (Continued)

# JUSTIFICATION/COMMENTS

Qualification Report QTR 155 supports the change of contact block/ carrier material from Asbestos-filled Phenolic to glass-filled Phenolic for the contact block and Poly (Amide-Imide) for the carrier. This test report provides a comprehensive comparison of the physical properties between the old and new material and concludes that both new materials (RX865 glass-filled Phenolic and Torlon 4203L Poly) either meet or exceed the capabilities of the old Asbestos-filled Phenolic material (RX490). We agree with this conclusion and find replacement parts made from these materials and new switches containing these materials acceptable for use. All switches and replacement parts shipped after November, 1986 will be made from these materials.





BINDER NO BINDER TIT SWITCHES	WBNEQ-IZS-001       PLANT       WBN       UNIT(S)       1       SHEET       16 OF       37         LE       EA180 SERIES LIMIT       COMPUTED       DATE $6/26/86$ R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R       R
J. <u>E(</u> S] (1	DUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE PECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (yes/no/NA)? Yes (Reference TAB D, p 11-27). Identify Acceptance Criteria: See TAB D, Section 7.0, page 11-27.
(:	Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (yes/no/NA)? Yes (Reference TAB D, p 11-15, Sect 6.2). Identify baseline and functional testing: See TAB D, p 11-16, Sect 6.2.1 and p 11-17, Sect 6.2.2.
(:	JUSTIFICATION/COMMENTS <u>None</u> ) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p 10-50 ).</u>
	JUSTIFICATION/COMMENTS None

BIND Limi Afte	ER TI <u>t Swi</u> r 7/3	TLE tches 0/80	EA 180 Series COMPUTED DRS DATE Manufactured CHECKED RNB DATE	6/25/86 TDH 5/25/89 6/27/86 HDR	
			· ·	6/4/89	
т	FOUT	DMENT	TI FOTDICAL CUADACTEDISTICS NECESSARY TO	ENCIDE TUE	
••	PERF	ORMAN	CE SPECIFICATIONS CAN BE SATISFIED UNDER	ACCIDENT CONDITIC	
	(Con	tinue	d)		
	(4)	Do t	he applied loads during baseline testing	reflect normal	
		operating conditions (Yes/No/NA)? <u>Yes</u> (Reference:			
		TAB	D, pp 5-1 through 5-3	/·	
		JUST	IFICATION/COMMENTS None		
	(5)	Iden	tify electrical characteristics necessar	y to ensure the	
		equi	pment performance specifications can be	satisfied.	
•		(a)	Persenten Plant Normal Garditians	Defense	
		(a)	rarameter Flant Normal Conditions	<u></u>	
			Voltage NA	NA	
			Load <u>NA</u>	NA	
			Frequency <u>NA</u>	NA	
			Accuracy <u>NA</u>	NA	
			<u>Other(s)</u>		
			Insulation		
			Resistance		
			Minimum NA	NA	
			Closed Contect	-	
			open less than		
			2 milli-sec		
			during seismic		
			test NA	NA	
			JUSTIFICATION/COMMENTS <u>See Comment J(5</u>	)(c)	
		(h)	Parameter Specific Accident Conditions	Reference	
			Talameter Decilie Metident Conditions	<u></u>	
			Voltage <u>See Comment</u>	NA	
			Load <u>See Comment</u>	NA	
			Frequency <u>NA</u>	NA	
			Accuracy <u>NA</u>	NA	
			Uther(s)		
			Minimum See Comment	NA	
				<u>+ 14 A</u>	
			Closed Contact		
			open less than		
			2 milli-sec		
			during seismic		

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<u>t Swi</u> r 7/3	tches Manufact 0/80	<u>ries</u> COMPUTED <u>DRS</u> DATE <u>ured</u> CHECKED <u>RNB</u> DATE	<u>6/27/86</u> 5/25/89 6/27/86 2/01 6/9/81
EQUI PERF (Con	PMENT ELECTRIC FORMANCE SPECIF	AL CHARACTERISTICS NECESSARY TO ICATIONS CAN BE SATISFIED UNDER	ENSURE THE ACCIDENT CONDIT
(c)	Parameter	Demonstrated Conditions	<u>Reference</u>
	Voltage	125V AC/DC	<u>TAB D, p 3-4</u>
	-	0.5 amp/100VDC	TAB D, pp 10-4
	Load	0.086 amp/100VDC	Section 7.1
	Frequency	<u>NA</u>	NA
	Accuracy	<u>NA</u>	<u>NA</u>
	<u>Other(s)</u>		
	Insulation <u>Resistanc</u> e	<u>≥_5 M oHM</u>	TAB D, pp 10-4 10-45, 10-50
	Contact	х.	TAB D, p 7-1,
	<u>Opening</u>	< 2 milli-sec	Section 7.1
	JUSTIFICATION switches is i	/COMMENTS <u>The typical applicat</u> n control circuits, for example	ion of these lim solenoid valves
	<u>These circuit</u>	<u>s operate at 120VAC or 125VDC w</u>	ith current
	ratings of ap	proximately 0.3 to 1.3 amps. T	<u>his is well with</u>
	the UL and na	<u>meplate ratings of 20 amps @ 12</u>	5VAC and 5 amps
	@ 125VDC. Th	e demonstrated load of 0.5 amps	@ 100VDC for
	<u>mechanical ag</u>	ing and 0.086 amps @ 100VDC for	all other per-
	<u>formance_test</u>	s is considered adequate for th	e following
	reasons: (1)	Low voltage and currents may n	ot break down th
	<u>film/oxide an</u>	<u>d therefore provide little cont</u>	act surface
		•	

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and the second

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BINI Lim:	R 1 R DER TITLE <u>EA 180 Series</u> COMPUTED <u>R1 JD</u> DATE <u>S/17/84</u> it Switches Manufactured
Aft	er 7/30/80 CHECKED R1 201 DATE 6/9/89
J.	EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDIT (Continued)
	JUSTIFICATION/COMMENTS (CONTINUED)
	(2) When switches are operated at rated voltage and currents, th contact surfaces tend to be self-cleaning and/or the potenti of the circuit is sufficient to break down films or oxides that might form on the contact faces. While there are no plant specific requirements with regard to contact bounce an insulation resistance minimum, the values demonstrated are considered adequate. At 5M ohms, there would be a slight leakage current of approximately 0.025 milliamps for a typic 125V circuit. This small leakage current should not provide enough amperage to cause any adverse circuit operation.
	(3) Since TVA's standard design practices prevent circuits from exceeding the UL ratings of contacts, the 100VDC and 0.086 amp load used for testing is conservative and adequate considering items (1) and (2) above.
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Page <u>B-19</u> R1 was deleted per revision <u>2</u>. WBEP-0158Q

Afte	er 7/3	/80	CHECKED	RNB	DATE <u>6/</u>	27/86_7 6/9	189 189
K.2	<u>REQU</u>	RED OPERATING ENV	IRONMENT Room	n 737.0	<b>-A</b> 5	•	
	Refe	ence Environmenta	1 Drawing No.	<u>47E235</u>	-48	• 	
	(1)	Normal Max	(2)	) Abno	rmal Max		
		(a) Temperature	(°F) <u>104</u>	(a)	Temperatu	re (°F)	<u>110</u>
		(b) Pressure (ps	ig) <u>ATM(-)</u>	(b)	Pressure	(psig)	<u>ATM(</u>
		(c) Humidity (%)	80	(c)	Humidity	(%)	<u>90</u>
		(d) Radiation (r	(a) $\frac{8.8 \times 10^5}{10}$	(d)	Radiation	(rd)	NA
	(2)		•				
	(3)	Process Interface	s: <u>None</u>				
	(3)	Process Interface	s: <u>None</u>			<u> </u>	· · · · ·
		Process Interface	s: <u>None</u>	•			
	(4)	Process Interface	es: <u>None</u> l occurrence fr prmal condition	equenc; is coul	y and dura d exist fo	tion of r up to	abno eigh
	(4)	Process Interface State anticipated conditions: <u>Abno</u> nours per excursi	es: <u>None</u> l occurrence fr prmal condition on and will oc	equenc s coul ccur le	y and dura d exist fo ss than 1%	tion of r up to of the	abno eigt plan
	(4)	Process Interface State anticipated conditions: <u>Abno</u> <u>nours per excursi</u> Life. (Effect on	es: <u>None</u> l occurrence fr ormal condition on and will oc	requenc as coul ccur le	y and dura d exist fo ss than 1% egligible.	tion of or up to of the See g	abno eigh plan eneri
	(4)	Process Interface State anticipated conditions: <u>Abno</u> Nours per excursi Life. (Effect on position in Binde	es: <u>None</u> l occurrence fr ormal condition on and will oc qualified lif	equenc ns coul ccur le e is no N-001)	y and dura <u>d exist fo</u> ss than 1% egligible.	tion of or up to of the See g	abnc eigh plan eneri
	(3) (4) (5)	Process Interface State anticipated conditions: <u>Abno</u> <u>nours per excursi</u> <u>life. (Effect on</u> <u>position in Binde</u> Accident (worst c parameter includi	es: <u>None</u> l occurrence fr ermal condition on and will oc qualified lif er No. WBNEQ-GE case for any co ng peak, durat	requenc; as coul ccur les te is no EN-001) ombinat	y and dura <u>d exist fo</u> <u>ss than 1%</u> egligible. ion of spe nd profile	tion of or up to of the See g cified ):	abno eigh plan eneri accio
-	(4)	Process Interface State anticipated conditions: <u>Abno</u> <u>nours per excursi</u> life. (Effect on <u>position in Binde</u> Accident (worst c parameter includi (a) Temperature	es: <u>None</u> l occurrence fr <u>ormal condition</u> <u>on and will oc</u> <u>qualified lif</u> er No. <u>WBNEQ-GE</u> case for any co ng peak, durat (°F) <u>110</u>	requenc; as could ccur le ccur le ce is no control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control control con	y and dura d exist fo ss than 1% egligible. ion of spe nd profile Accident t	tion of r up to of the See g cified ): ype LOC	abnc eigh plan eneri accid
	(3) (4) (5)	Process Interface State anticipated conditions: <u>Abno</u> <u>nours per excursi</u> Life. (Effect on <u>position in Binde</u> Accident (worst c parameter includi (a) Temperature (b) Pressure (ps	es: <u>None</u> l occurrence fr ermal condition on and will oc qualified lif er No. WBNEQ-GE case for any co ng peak, durat (°F) <u>110</u>	requenc; is coul cour les ie is no ie is no ion, as ion, as	y and dura d exist fo ss than 1% egligible. ion of spe nd profile Accident t	tion of <u>r up to</u> of the See g cified ): ype LOC ype NA	abno eigh plan eneri accid
	(3)	Process Interface State anticipated conditions: <u>Abno</u> <u>nours per excursi</u> <u>life. (Effect on</u> <u>position in Binde</u> Accident (worst c parameter includi (a) Temperature (b) Pressure (ps (c) Humidity (%)	es: <u>None</u> l occurrence fr ermal condition on and will oc qualified lif er No. WBNEQ-GE case for any co ng peak, durat (°F) <u>110</u> ig) <u>NA</u> <u>NA</u>	requenc; as coul ccur le ccur le ce is no contrat ion, as	y and dura d exist fo ss than 1% egligible. ion of spe nd profile Accident t Accident t	tion of <u>o of the</u> <u>See g</u> cified ): ype <u>LOC</u> ype <u>NA</u> ype <u>NA</u>	abnc eigh plan eneri accid
-	(4)	Process Interface State anticipated conditions: <u>Abno</u> <u>hours per excursi</u> <u>life. (Effect on</u> <u>position in Binde</u> Accident (worst c parameter includi (a) Temperature (b) Pressure (ps (c) Humidity (%) (d) Radiation (r	s: <u>None</u> l occurrence fr prmal condition on and will oc qualified lif er No. WBNEQ-GF case for any co ng peak, durat (°F) <u>110</u> ig) <u>NA</u> NA NA	requenc; as could ccur les ie is no ie is no ie is no ion, as ion, as	y and dura d exist fo ss than 1% egligible. ion of spe nd profile Accident t Accident t Accident t	tion of or up to of the See g cified ): ype LOC ype NA ype NA ype LOC	abno eigh plan eneri accid A

PAGE B-20 R	1	
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BINDER T	0. <u>WBNEQ-IZS-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>21</u> R <u>1</u> R ITLE EA 180 Series COMPUTED DRS DATE <u>8/14/86 10 مل</u> itches Manufactured هم مراجع
After 7/.	30/80 CHECKED RNB DATE <u>8/14/86</u> 6/9/59
K.3 <u>REQ</u> I	UIRED OPERATING ENVIRONMENT Room 713.0-A6
Ref	erence Environmental Drawing No. <u>47E235-56</u>
(1)	Normal Max (2) Abnormal Max
	(a) Temperature (°F) <u>104</u> (a) Temperature (°F) <u>11</u>
	(b) Pressure (psig) <u>ATM(-)</u> (b) Pressure (psig) <u>AT</u>
	(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>
	(d) Radiation (rd) $\frac{2.2 \times 10^6}{2.2 \times 10^6}$ (d) Radiation (rd) NA
(3)	Process Interfaces: <u>None</u>
(4)	State anticipated occurrence frequency and duration of ab
	conditions: Appormal conditions could exist for up to en
	hours per excursion and will occur less than 1% of the pl
	hours per excursion and will occur less than 1% of the pl life. (Effect on qualified life is negligible. See gene
	conditions: <u>Apnormal conditions could exist for up to en</u> hours per excursion and will occur less than 1% of the pl life. (Effect on qualified life is negligible. See gene position in Binder No. WBNEQ-GEN-001).
(5)	conditions: <u>Abnormal conditions could exist for up to enhours per excursion and will occur less than 1% of the pl life. (Effect on qualified life is negligible. See gene position in Binder No. WBNEQ-GEN-001).</u> Accident (worst case for any combination of specified acc parameter including peak, duration, and profile):
(5)	conditions:Apnormal conditions could exist for up to endhours per excursion and will occur less than 1% of the pllife.(Effect on qualified life is negligible. See geneposition in Binder No. WBNEQ-GEN-001).Accident (worst case for any combination of specified accparameter including peak, duration, and profile):(a) Temperature (°F) 110
(5)	conditions:       Abnormal conditions could exist for up to end         hours per excursion and will occur less than 1% of the pl         life.       (Effect on qualified life is negligible. See gene         position in Binder No. WBNEQ-GEN-001).         Accident (worst case for any combination of specified acceparameter including peak, duration, and profile):         (a)       Temperature (°F) 110         Accident type LOCA         (b)       Pressure (psig)
(5)	conditions:       Approximat conditions could exist for up to end         hours per excursion and will occur less than 1% of the pl         life.       (Effect on qualified life is negligible. See gene         position in Binder No. WBNEQ-GEN-001).         Accident (worst case for any combination of specified acceparameter including peak, duration, and profile):         (a)       Temperature (°F) 110         Accident type LOCA         (b)       Pressure (psig)         NA       Accident type NA         (c)       Humidity (%)
(5)	conditions:Apnormal conditions could exist for up to endhours per excursion and will occur less than 1% of the pllife.(Effect on qualified life is negligible. See geneposition in Binder No.WBNEQ-GEN-001).Accident (worst case for any combination of specified accparameter including peak, duration, and profile):(a)Temperature (°F) 110(b)Pressure (psig)NAAccident type NA(c)Humidity (%)(d)Radiation (rd) $2 \times 10^6$ Accident type LOCA
(5)	conditions: ADnormal conditions could exist for up to end         hours per excursion and will occur less than 1% of the pl         life. (Effect on qualified life is negligible. See gene         position in Binder No. WBNEQ-GEN-001).         Accident (worst case for any combination of specified acceparameter including peak, duration, and profile):         (a) Temperature (°F) 110         Accident type LOCA         (b) Pressure (psig) NA         Accident type NA         (c) Humidity (%)         NA         Accident type NA         (d) Radiation (rd) 2 x 10 ⁶ Accident type LOCA         (e) Spray Type         NA
(5)	conditions:Apnormal conditions could exist for up to endhours per excursion and will occur less than 1% of the pllife.(Effect on qualified life is negligible. See geneposition in Binder No.WBNEQ-GEN-001).Accident (worst case for any combination of specified accparameter including peak, duration, and profile):(a)Temperature (°F) 110(b)Pressure (psig) NA(c)Humidity (%)NAAccident type NA(d)Radiation (rd) $2 \times 10^6$ Accident type NA(e)Spray TypeNAAccident type NA

	/30/80		CHECKED	RNB	DATE <u>8</u> /	<u>/14/86_2</u> 6/1	189 189
K.4 <u>RE</u>	QUIRED	OPERATING ENVIRON	<u>MENT</u> Room	713.0	-A28		
Re	ference	e Environmental Dr	awing No.	<u>47E235</u>	-61		
(1	) Norm	nal Max	(2)	Abno	rmal Max	- e	
	(a)	Temperature (°F)	<u>104</u>	(a)	Temperatu	ıre (°F)	11
	(b)	Pressure (psig)	<u>ATM(-)</u>	(b)	Pressure	(psig)	<u>A</u> 2
	(c)	Humidity (%)	80	(c)	Humidity	(%)	<u>9(</u>
	(d)	Radiation (rd)	$\frac{6}{7.5 \times 10}$	(d)	Radiation	n (rd)	<u>N/</u>
	(-)						
(3 . (4	) Proc  ) Stat	cess Interfaces:	None	equenc	y and dura	ation of	al
(3 . (4	) Proc  ) Stat cond <u>hour</u>	te anticipated occ ditions: <u>Abnormal</u>	None currence fr condition and will oc	requenc is coul cur le	y and dura d exist fo ess than 12	ation of or up to % of the	i ai bi e bi e
(3	) Proc  ) Stat cond hour life	cess Interfaces: te anticipated occ ditions: <u>Abnormal</u> rs per excursion a e. (Effect on qua ition in Binder No	None currence fr condition and will oc alified lif	equenc s coul cur le e is r	y and dura d exist for ess than 19 egligible	ation of or up to % of the . See g	al b e: p geno
(3 - (4 (5	) Proc 	cess Interfaces: te anticipated occ ditions: <u>Abnormal</u> <u>rs per excursion a</u> <u>e. (Effect on qua</u> <u>ition in Binder No</u> ident (worst case ameter including p	None currence fr condition and will oc alified lif b. WBNEQ-GE for any co beak, durat	equences cour le e is r N-001) ombinate ion, a	y and dura d exist for ess than 12 egligible ion of spead	ation of or up to & of the . See g ecified e):	ac
(3 (4	) Prod  ) Stat cond hour life posi ) Acci para (a)	te anticipated occ ditions: <u>Abnormal</u> rs per excursion a <u>e. (Effect on qua</u> <u>ition in Binder No</u> ident (worst case ameter including p Temperature (°F)	None currence fr condition and will oc alified lif b. WENEQ-GE for any co beak, durat	equences coul cur le e is r N-001) ombinate ion, a	y and dura d exist for ess than 12 egligible ion of spond profile Accident	ation of or up to & of the . See g ecified e): type LOC	ac 2 a 2 a 3 c 2 a 2 a 2 a 2 a
(3 - (4 (5	) Prod 	te anticipated occ ditions: <u>Abnormal</u> <u>rs per excursion a</u> <u>e. (Effect on qua</u> <u>ition in Binder No</u> ident (worst case ameter including p Temperature (°F) Pressure (psig)	None currence fr condition and will oc alified lif b. WBNEQ-GE for any co beak, durat 0 110 NA	requences s coul cur le e is r N-001 ombinat cion, a	y and dura d exist for ess than 12 egligible ion of spond nd profile Accident Accident	ation of or up to & of the . See g ecified e): type LOC type NA	i a p e e p en ac
(3 - (4 - (5	) Prod 	te anticipated occ ditions: <u>Abnormal</u> rs per excursion a <u>e. (Effect on qua</u> <u>ition in Binder No</u> ident (worst case ameter including p Temperature (°F) Pressure (psig) Humidity (%)	None Currence fr condition and will oc alified lif b. WBNEQ-GE for any co beak, durat b 110 NA NA	equences coul cur le e is r N-001) ombinate ion, a	y and dura d exist for ess than 19 egligible ion of spond profile Accident Accident Accident	ation of or up to & of the . See g ecified e): type LOC type NA type NA	i al p e genu ac
(3 . (4 (5	<ul> <li>) Prod</li> <li>) Prod</li> <li></li></ul>	te anticipated occ ditions: <u>Abnormal</u> <u>rs per excursion a</u> <u>e. (Effect on qua</u> <u>ition in Binder No</u> <u>ident (worst case</u> <u>ameter including p</u> <u>Temperature (°F)</u> <u>Pressure (psig)</u> <u>Humidity (%)</u> Radiation (rd)	None None Currence fr condition and will oc alified lif b. WBNEQ-GE for any co beak, durat 0 110 NA NA 5 x 10 ⁶ *	requence is coul cour le ie is r N-001) ombinat cion, a	y and dura d exist for ess than 12 egligible ion of spond Accident Accident Accident Accident	ation of <u>or up to</u> <u>5 of the</u> <u>5 See g</u> ecified e): type LOC type NA type NA	i al p e gen ac CA

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WBNEQ-IZS-001



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WBEP-0158Q

.imi Afte	<u>t Swi</u> r 7/3	tches         Manufactured         5/17/89         12/11/89           0/80         CHECKED         RNB         DATE         8/14/86         HDR         \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$
	<u>REQU</u> Refe	IRED OPERATING ENVIRONMENT Room 757.0-A16 erence Environmental Drawing No. <u>47E235-78</u>
	(1)	Normal Max (2) Abnormal Max
		(a) Temperature (°F) <u>104</u> (a) Temperature (°F) <u>110</u>
•		(b) Pressure (psig) ATM (b) Pressure (psig) ATM
		(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>
		(d) Radiation (rd) <u>1.8x10</u> (d) Radiation (rd) <u>NA</u>
	(3)	Process Interfaces: <u>None</u>
	(4)	State anticipated occurrence frequency and duration of abnormal conditions: <u>Maximum and minimum abnormal temperatures could</u>
		exist for up to eight hours per excursion and will occur less
		than 1% of the plant life. Maximum abnormal temperatures
		could exist for up to 10 hours "per month during" 4 months of
		the year because of the EGTS units being operated for testing
		and maintenance.
	(5)	Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):
		(a) Temperature (°F) <u>110</u> Accident type <u>LOCA</u>
		(b) Pressure (psig) <u>NA</u> Accident type <u>NA</u>
		(c) Humidity (%) <u>NA</u> Accident type <u>NA</u>
		(d) Radiation (rd) $(1.7 \times 10^7 \times \text{Accident type } \text{LOCA}   R2  $
		(e) Spray Type <u>NA</u> Accident type <u>NA</u>
	* Se	e TAB C (2)

BINDER TI Limit Swi	TLE	EA 180 Series Manufactured	COMPUTED <u>DR</u>	<u>S</u> :	DATE <u>8</u>	/15/86_7 /15/86_7 /15/86_2	1014 17189 LQ11
ALCEL //.	0/00	······	CHECKED <u>KI</u>		DAIE O	<u>[15780_4</u> 6/9	9/89
K.7 <u>REOL</u>	IRED	OPERATING ENVIRON	MENT ANN				
Refe	rence	Environmental Dr	awing No. <u>47</u> E	235-44			
(1)	Norm	al Max	(2)	bnorma	Max	<u> </u>	
	(a)	Temperature (°F)	110 (	a) Te	nDerati	ure (°F)	120
	(b)	Pressure (psig)	<u>ATM(-)</u> (	b) Pr	essure	(psig)	ATM
	(c)	Humidity (%)	<u>80 (</u>	c) Hu	nidity	(%)	90
•	(d)	Radiation (rd)	$1 \times 10^{6}$ (	d) Ra	liation	n (rd)	<u>NA</u>
(3)	Proc	ess Interfaces:	None				
			,				
		-					
(4)	Stat	e anticipated occ	urrence frequ	iency a	nd dura	ation of	abn
(4)	Stat cond	e anticipated occ itions: <u>Abnormal</u>	urrence frequ conditions c	iency a ould e:	nd dura kist fo	ation of or up to	abn eig
(4)	Stat cond <u>hour</u>	e anticipated occ itions: <u>Abnormal</u> s per excursion a	currence frequ conditions c and will occur	ency a could e less	nd dura <u>kist fo</u> than 15	ation of or up to % of the	abn eig pla
(4)	Stat cond <u>hour</u> <u>life</u>	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> . (Effect on qua	urrence frequ conditions c and will occur lified life i	ency a could e less s negl	nd dura kist fo than 15 igible	ation of or up to % of the . See g	abn eig pla ener
(4)	Stat cond hour life posi	e anticipated occ itions: <u>Abnormal</u> s per excursion a . (Effect on qua tion in Binder No	currence frequent conditions conditions cond	ency a could e less s negl	nd dura <u>kist fo</u> than 19 igible	ation of or up to % of the . See g	abn eig pla cener
(4)	Stat cond hour life posi Acci para	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> <u>. (Effect on qua</u> <u>tion in Binder No</u> dent (worst case meter including p	currence frequ conditions c and will occur lified life i WBNEQ-GEN-O for any combi peak, duration	ency an ould en less s negl 001). nation a, and	nd dura <u>tist fo</u> than 19 igible of spo profile	ation of or up to % of the . See g ecified e):	abn eig pla ener acci
(4) (5)	Stat cond <u>hour</u> <u>life</u> <u>posi</u> Acci para (a)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> <u>. (Effect on qua</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F)	currence frequ conditions c and will occur lified life i WBNEQ-GEN-O for any combi peak, duration	ency an could en less s negl 001). nation a, and Acc	nd dura <u>kist fo</u> than 12 igible of spe profile ident	ation of or up to & of the . See g ecified e): type LOC	abn eig pla ener acci
(4)	Stat cond hour life posi Acci para (a) (b)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> <u>. (Effect on qua</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F) Pressure (psig)	currence frequ conditions c and will occur lified life i WBNEQ-GEN-O for any combi peak, duration 133.7 <u>ATM(-)</u>	ency an ould end less s negl 001). nation a, and Acc Acc	nd dura <u>kist fo</u> than 19 igible of spo profile ident	ation of or up to & of the . See g ecified e): type LOC	abn eig epla cener acci A
(4) (5)	Stat cond hour life posi Acci para (a) (b) (c)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> <u>. (Effect on qua</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	currence freque conditions c and will occur alified life i b. WBNEQ-GEN-O for any combi- peak, duration 133.7 ATM(-) 61	ency an could end less s negl 001). nation a, and Acc Acc	nd dura <u>kist fo</u> than 12 igible of spo profile ident ident	ation of or up to & of the . See g ecified e): type LOC type LOC	abn eig pla e pla cener acci A A
(4)	Stat cond hour life posi Acci para (a) (b) (c) (d)	e anticipated occ itions: <u>Abnormal</u> <u>s per excursion a</u> <u>. (Effect on qua</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	currence frequ conditions c and will occur alified life i b. WBNEQ-GEN-O for any combi beak, duration 133.7 ATM(-) 61 1.2x ₅ 10 gamm 6x10 beta	ency an ould end less s negl 001). nation a, and Acc Acc Acc	nd dura <u>kist fo</u> <u>than 15</u> <u>igible</u> of spe profile ident ident ident ident	ation of or up to & of the . See g ecified e): type LOC type LOC type LOC	abn eig pla cener acci A A A

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Arte	<u>t Swi</u> r 7/3	ILE_EA 180 Series       COMPUTED_DRS       DATE 8/14/86 JDF         tches Manufactured       5//7/89         0/80       CHECKED RNB       DATE 8/14/86 2000000000000000000000000000000000000
		6/1/89
К.8	<u>REQU</u>	IRED OPERATING ENVIRONMENT L-Lower Containment
	Refe	rence Environmental Drawing No. <u>47E235-42</u>
	(1)	Normal Max (2) Abnormal Max
		(a) Temperature (°F) <u>120</u> (a) Temperature (°F) <u>130</u>
		(b) Pressure (psig) 0.3 (b) Pressure (psig) 0.3
		(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>100</u>
		(d) Radiation (rd) $\frac{2x10}{2x10}$ (d) Radiation (rd) NA
	(3)	Process Interfaces: <u>None</u>
	(4)	State anticipated occurrence frequency and duration of abnor
		conditions: <u>Abnormal conditions could exist for up to 8 hou</u> per excursion and will occur less than 1% of the plant life. (Effect on qualified life is negligible. See generic positi in binder WBNEQ-GEN-001).
	(5)	<pre>conditions: Abnormal conditions could exist for up to 8 hou per excursion and will occur less than 1% of the plant life. (Effect on qualified life is negligible. See generic positi in binder WBNEQ-GEN-001). Accident (worst case for any combination of specified accides parameter including peak, duration, and profile):</pre>
	(5)	<pre>conditions: Abnormal conditions could exist for up to 8 hou per excursion and will occur less than 1% of the plant life. (Effect on qualified life is negligible. See generic positi in binder WBNEQ-GEN-001). Accident (worst case for any combination of specified accider parameter including peak, duration, and profile): (a) Temperature (°F) 327 Accident type LOCA/HELB</pre>
	(5)	<pre>conditions: Abnormal conditions could exist for up to 8 hou per excursion and will occur less than 1% of the plant life. (Effect on qualified life is negligible. See generic positi in binder WBNEQ-GEN-001). Accident (worst case for any combination of specified accides parameter including peak, duration, and profile): (a) Temperature (°F) 327 Accident type LOCA/HELB (b) Pressure (psig) 11.2 Accident type LOCA/HELB</pre>
	(5)	conditions:Abnormal conditions could exist for up to 8 houper excursion and will occur less than 1% of the plant life.(Effect on qualified life is negligible.See generic positiin binder WBNEQ-GEN-001).Accident (worst case for any combination of specified acciderparameter including peak, duration, and profile):(a) Temperature (°F) 327Accident type LOCA/HELB(b) Pressure (psig) 11.2Accident type LOCA/HELB(c) Humidity (%)100Accident type LOCA/HELB
	(5)	<pre>conditions: Abnormal conditions could exist for up to 8 hou per excursion and will occur less than 1% of the plant life. (Effect on qualified life is negligible. See generic positi in binder WBNEQ-GEN-001). Accident (worst case for any combination of specified accides parameter including peak, duration, and profile): (a) Temperature (°F) 327 Accident type LOCA/HELB (b) Pressure (psig) 11.2 Accident type LOCA/HELB (c) Humidity (%) 100 Accident type LOCA/HELB 4.7x10⁸ beta</pre>
	(5)	<pre>conditions: Abnormal conditions requests for up to 8 hou per excursion and will occur less than 1% of the plant life. (Effect on qualified life is negligible. See generic positi in binder WBNEQ-GEN-001). Accident (worst case for any combination of specified accider parameter including peak, duration, and profile): (a) Temperature (°F) 327 Accident type LOCA/HELB (b) Pressure (psig) 11.2 Accident type LOCA/HELB (c) Humidity (%) 100 Accident type LOCA/HELB (d) Radiation (rd) 4x10⁷ gamma Accident type LOCA</pre>
	(5)	conditions:       Abnormal conditions could exist for up to 8 hou         per excursion and will occur less than 1% of the plant life.         (Effect on qualified life is negligible.         See generic positi         in binder WBNEQ-GEN-001).         Accident (worst case for any combination of specified accider         parameter including peak, duration, and profile):         (a) Temperature (°F) 327         Accident type LOCA/HELB         (b) Pressure (psig) 11.2         Accident type LOCA/HELB         (c) Humidity (%)         100         Accident type LOCA/HELB         (d) Radiation (rd)       4x10 ⁷ gamma         (e) Spray Type       *

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						11/7	190
K.9 <u>REQU</u>	IRED OPE	RATING ENVIRO	<u>NMENT</u> North	and S	outh Valv	e Rooms	
Refe	rence En	vironmental D	rawing No. <u>47</u>	'E235-	76	<u></u>	
(1)	Normal	Max	(2)	Abno	rmal Max	2)	
	(a) Țem	perature (°F)	130	(a)	Temperatu	re (°F)	<u>140</u>
	(b) Pre	ssure (psig)	<u>ATM(-)</u>	<b>(</b> b)	Pressure	(psig)	<u>ATM</u>
	(c) Hum	idity (%)	50%	(c)	Humidity	(%)	<u>100%</u>
		,	3 1.8x103 Nort	:h			
	(d) Rad	iation (rd)	<u>1.8x10</u> Sout	:h(d)	Radiation	(rd)	<u>NA</u>
(3)	Process	Interfaces:	None		<u> </u>		
		- · · · · · · · · · · · · · · · · · · ·					
	conditi <u>up to 8</u> <u>plant 1</u> <u>neously</u> <u>humidit</u> <u>return</u> <u>life is</u> <u>WBNEO-G</u>	ons: <u>Abnorma</u> hours per ex ife. The abn with abnorma y conditions to the normal negligible. EN-001).	1 temperature cursion and v ormal humidit 1 maximum tem could exist f maximum of 5 See generic	e cond vill o ty of mperat for up 50%. posit	titions co occur less 10% will ure of 14 to 8 hou (Effect o ion in bi	uld exi than 1 occur s 0°F. T rs and n quali nder	st for % of t imulta he will fied
(5)	conditi <u>up to 8</u> <u>plant 1</u> <u>neously</u> <u>humidit</u> <u>return</u> <u>life is</u> <u>WBNEQ-G</u> Acciden paramet	ons: <u>Abnorma</u> hours per ex ife. The abn with abnorma y conditions to the normal negligible. EN-001). t (worst case er including	<pre>1 temperature cursion and v ormal humidit 1 maximum tem could exist f maximum of 5 See generic for any comb peak, duratic</pre>	e cond vill o ty of nperat for up 50%. posit	titions co occur less 10% will ure of 14 to 8 hou (Effect o ion in bi on of spe d profile	<u>uld exi</u> <u>than 1</u> <u>occur s</u> <u>0°F. T</u> <u>rs and n</u> <u>n quali</u> <u>nder</u> cified ):	st for % of t imulta he will fied accide
(5)	conditi <u>up to 8</u> <u>plant 1</u> <u>neously</u> <u>humidit</u> <u>return</u> <u>life is</u> <u>WBNEO-G</u> Acciden paramet *(a) Te	ons: <u>Abnorma</u> hours per ex ife. The abn with abnorma y conditions to the normal negligible. EN-001). t (worst case er including mperature (°F	<pre>1 temperature cursion and v ormal humidit 1 maximum tem could exist f maximum of 5 See generic for any comb peak, duratic ) *453</pre>	e cond vill o ty of nperat for up 50%. posit	titions co occur less 10% will ure of 14 to 8 hou (Effect o ion in bi on of spe d profile	<u>uld exi</u> <u>than 1</u> <u>occur s</u> <u>0°F. T</u> <u>rs and</u> <u>n quali</u> <u>nder</u> cified ): ype <u>MSL</u>	st for % of t imulta he will fied accide
(5)	<pre>conditi <u>up to 8</u> <u>plant 1</u> <u>neously</u> <u>humidit</u> <u>return</u> <u>life is</u> <u>WBNEO-G</u> Acciden paramet *(a) Te (b) Pr</pre>	ons: <u>Abnorma</u> hours per ex ife. The abn with abnorma v conditions to the normal negligible. EN-001). t (worst case er including mperature (°F essure (psig)	<pre>1 temperature cursion and v ormal humidit 1 maximum tem could exist f maximum of 5 See generic for any comb peak, duratic ) *453 8.77 North 10.78 South</pre>	e cond vill o ty of aperat for up 50%. posit on, an A A A	titions co occur less 10% will ure of 14 to 8 hou (Effect o ion in bi on of spe d profile ccident t	ype FW	st for % of f imult: he will fied accide
(5)	conditi <u>up to 8</u> <u>plant 1</u> <u>neously</u> <u>humidit</u> <u>return</u> <u>life is</u> <u>WBNEO-G</u> Acciden paramet *(a) Te (b) Pr (c) Hu	ons: <u>Abnorma</u> <u>hours per ex</u> <u>ife. The abn</u> <u>with abnorma</u> <u>v conditions</u> <u>to the normal</u> <u>negligible.</u> <u>EN-001).</u> t (worst case er including mperature (°F essure (psig) midity (%)	<pre>1 temperature cursion and v ormal humidit 1 maximum tem could exist f maximum of 5 See generic for any comb peak, duratic ) *453 8.77 North 10.78 South 100%</pre>	e cond vill o ty of perat for up 50%. posit on, an A A A A	Litions co occur less 10% will oure of 14 to 8 hou (Effect o ion in bi con of spe d profile ccident t ccident t	ype <u>FW</u>	st for % of f imulta he will fied accide B
(5)	<pre>conditi <u>up to 8 plant 1 neously humidit return life is WBNEO-G Acciden paramet *(a) Te (b) Pr (c) Hu (d) Ra</u></pre>	ons: <u>Abnorma</u> <u>hours per ex</u> <u>ife. The abn</u> <u>with abnorma</u> <u>y conditions</u> <u>to the normal</u> <u>negligible.</u> <u>EN-001).</u> t (worst case er including mperature (°F essure (psig) midity (%) diation (rd)	<pre>1 temperature cursion and v ormal humidit 1 maximum tem could exist i maximum of 5 See generic for any comb peak, duratic ) *453 8.77 North 10.78 South 100% 4 &lt; 1 x 10</pre>	e cond vill o ty of perat for up 50%. posit oinati on, an A A A A	Litions co occur less 10% will sure of 14 to 8 hou (Effect o cion in bi on of spe d profile ccident t ccident t ccident t	ype FW ype LOC	st for % of f imulta he will fied accide B

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	Comments (duration/peak/profile/spray composition and pH,
	margin, etc.): For a cross-reference of equipment to
	environmental drawing see TAB G.
(6)	Is the equipment subject to moisture or liquid intrusion what
	can affect the performance of the equipment under design bas accident conditions (Yes/No/NA)? Yes (Reference: See
	TAB G for the limit switches requiring conduit seals
(7)	Subject to submergence (Yes/No/NA)? <u>No*</u> (Reference: TAB C (10)
	Identify initiation time and duration of submergence: <u>NA</u>
(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>Environmental Drawing 47E235-42</u>
-	If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify:
	See Section P(3) this TAB.
(9)	Special environmental calculations (temp., rad., etc.)
	<u>Type</u> <u>RIMS No.</u>
	See TAB B, Section A

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D-20 KT

	. <u>WBNEQ-IZS-001</u> PLANT	WBN	_ UNIT(S)1	SHEET <u>29</u> 0F <u>3</u> R 1 R 4
BINDER TI	TLE EA 180 Series	COMPUTEDI	DRS DATE	8/14/86 JDH KBN
<u>Limit Swi</u>	tches Manufactured			6/9/89 ¹¹ /6/9
After <u>7/3</u>	0/80	CHECKED	<u>NB</u> DATE	<u>8/14/86_HDR</u> 6/9/89_///7/9
L. <u>SUMM</u>	ARY COMPARISON OF TEST	CONDITIONS	TO SPECIFIED	CONDITIONS
(1)	Comparison of worst-ca	ise maximum	parameters:	χ.
	Parameter	<u>Specified</u>	Demonstrated	<u>Reference</u>
•	Operating Time	<u>100 days</u>	30 days	TAB C(4)
	Temperature (°F)	<u>327</u>	391	<u>TAB D, p 10-14</u>
	Pressure (psig)	<u>12.0</u>	<u>119</u>	TAB D, p 10-14
		1	•••	TAB D,
·	Relative Humidity (%)	100	100	<u>pp 10-9, 10-51</u>
	Chemical Spray*	TAB C(3)	TAB_C(3)	TAB D, pp 10-9, 10-51
	4	.7x10 ⁸ beta		beta-see P(3)
	Radiation (rd)**	7 <u>6x10 gamm</u> a	8 2.04x10 gamm	a <u>TAB D, p 10-5</u>
	Submergence	NA	NA	<u>NA</u>
* **	*Includes spray concent pH. **Enter 40-year integras dose and specify type **See TAB C(4)	tration, flo ted normal o	owrate, densi lose plus int	ty, duration, and egrated accident
(2)	Comparison of worst-ca	ase profiles	and margin a	assessment:
а <b>н</b>	Parameter	Test I Envelopes (Yes/	Profile Specified (No/NA)	Reference
	Temperature	Yes	d	TAB C
	Temperature Pressure	Yes Yes	<u> </u>	TAB C See L(1)
	Temperature Pressure Relative Humidity	Yes Yes	§	TAB C See L(1) See L(1)
	Temperature Pressure Relative Humidity Chemical Spray	Yes Yes Yes Yes	<u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u> 1</u></u>	TAB C See L(1) See L(1) TAB C
	Temperature Pressure Relative Humidity Chemical Spray Submergence	Yes Yes Yes Yes NA	2 2 2 1	TAB_C         See L(1)         See L(1)         TAB_C         TAB_C

BINDER NO. WBNEO-IZS-001 PLANT WBN UNIT	(S) <u>1</u> SH	EET <u>30</u> 0F <u>37</u>
BINDER TITLE <u>EA 180 Series</u> COMPUTED <u>DRS</u>	_ DATE <u>8/14/8</u>	6 <u>KBN</u>
After 7/30/80 CHECKED RNB	_ DATE <u>8/14/8</u>	6 <u>JOH</u>
2 L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SP</u>	ECIFIED CONDI	TIONS
(3) Were margins applied to the test parame addressed in the test program to assure and uncertainties are accounted for? (N yes/no/NA)	ters or other that normal ote margin ap	wise variation plied,
Suggested Margins Per IEEE-323(74)	Applied	Yes/No/NA
Temperature: +15 degrees F	<u>+64</u> +892%	Yes
Pressure: +10% but no more than 10 psig	<u>(107 psig)</u>	Yes
Radiation: +10% of accident dose	10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	<u>TAB C(4)</u>	<u>Tab C(4)</u>   F
Voltage: ± 10% of rated value	NA	<u>NA</u>
Frequency: $\pm$ 5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	<u>2 Dwells</u>	Yes
Vibration: +10% added to acceleration	<u> 317% - See</u> Comments	Yes
JUSTIFICATION/COMMENTS: Per TVA standard s	specification	<u>SS-E18.12.10</u>
Seismic Requirements for Category I Elect	rical and I&C	Equipment,
these limit switches should be tested to ;	<u>g's horizont</u>	al and 2 g's
vertical. Since Namco verified in App. C	of their repo	ort (TAB D,
pp 10-35 through 10-39) that cross-coupling	<u>ng was not sig</u>	nificant,
the single axis test performed in each of	the 3 axis to	9,52 g's
was more than adequate.		
The applied margin to the maximum accident	<u>temperatures</u>	is
acceptable since the initial transient and	l the peak tem	perature were
applied twice, Reference; NUREG-0588, Rev	vision 1, Part	<u> </u>
Comment No. 73, pages II-38 and II-39, and	<u>I IEEE 323-198</u>	3. pages 18
and 19.	· · · · · · · · · · · · · · · · · · ·	

BINDER NO	. <u>WBNEQ-IZS-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>31</u> OF R_4 R
BINDER TI	TLE EA 180 Series COMPUTED DRS DATE 8/14/86
Limit Swi After 7/3	CHECKED RNB DATE 8/14/86 JOH
<u> </u>	······································
M. <u>OPER</u>	ABILITY TEST RESULTS
(1)	Identify the safety function(s) of this equipment: (Reference <u>See TAB A</u> ).
	JUSTIFICATION/COMMENTS None
(2)	Did the equipment performs its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes -
	See comment (Reference TAB D, p. 7-1, Section 7.1).
	JUSTIFICATION/COMMENTS <u>One failure to transfer was recorded.</u> Namco believes this may have been aggravated by the test
	set-up. See TAB D, page 7-1, Section 7,2.
(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference TAB D, p. $10-10$ ).
•	JUSTIFICATION/COMMENTS None
(4)	Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? Yes (Reference See TAB C(4).
	JUSTIFICATION/COMMENTS See TAB C(4) for additional comments.
(5)	Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? <u>Yes</u> (Reference <u>TAB_C(6)</u> ).
	JUSTIFICATION/COMMENTS See TAB C(6) for additional comments.
	<u></u>
	PAGE B-31 R4

WBEP-0158Q-50

BIN BIN SWII	DER NO. WBNEQ-IZS-001 PLANT WBN UNIT(S) 1 SHEET 32 DER TITLE EA1 80 SERIES LIMIT COMPUTED WBY DATE 8/14/86 R - F CCHES MANUFACTURED AFTER 7/30/80 CHECKED AFE JULICA
N.	MAINTENANCE AND SURVEILLANCE Has the qualification program identified those surveillance, maintenance, and inspection parameters which are essential to maintain qualification a which aid in detecting degrading materials or equipment performance (yes/no/NA)? Yes_ (Enter all requirements in Section G of the EQC Binder - Qualification Maintenance Data Sheets).
•	PAGE 6-32

BINDER TITLE EAL 80 SERIES LIMIT COMPUTED UP DATE	8/14/84
SWITCHES MANUFACTURED AFTER 7730780 CHECKED KN/25 DATE	3/14/86
0. <u>SUMMARY OF REVIEW</u>	
(1) Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	_NA
(3) Choice of qualification methodology adequately justified?	Yes
(4) If analysis was performed, complete the following:	
(a) Were equipment performance requirements identified?	NA
(b) Were specific features and failure modes and effects analyzed?	NA
(c) Were assumptions and mathematical models used together with appropriate justification for their use?	NA
(d) Were environmental parameters which affect equipment performance identified?	NA
(5) Adequate similarity between equipment and test specimen established?	YES
(6) Aging degradation evaluated adequately?	YES
(a) Mechanical and/or cycle aging addressed?	YES
(b) Equipment aged to end of life condition prior to application of DBE conditions?	YES
(c) Absence of preaging in test/analysis justified?	<u>_NA</u>
(d) Materials susceptible to thermal/radiation aging identified?	YES-Section I <u>&amp; TAB C(8)</u>

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BINDER NO. WB NEQ-IZ S-001 PLANT WB N UNIT(S) 1 BINDER TITLE EAL 80 SERIES LIMIT COMPUTED DATE S SWITCHES MANUFACTURED AFTER 7/30/80 CHECKED RNB DATE S	SHEET <u>34</u> OF <u>37</u> 14 RR 14 RR 14 RR
0. <u>SUMMARY OF REVIEW</u> (Continued) (e) Normally operating state of device (e.g., normally energized) considered?	Yes/No/NA See Section P(2) YES
<ul><li>(7) Qualified life or replacement schedule established?</li><li>(8) Criteria regarding temperature/pressure exposure satisfied?</li></ul>	Yes
(a) Peak temperature adequate (b) Peak pressure adequate	YesYes
<ul> <li>(c) Duration adequate</li> <li>(d) Required profile enveloped adequately</li> <li>(e) Steam exposure adequate</li> </ul>	Yes
<ul><li>(9) Criteria regarding test sequence satisfied?</li><li>(10) Criteria regarding spray satisfied?</li></ul>	Yes
 <ul> <li>(a) Was the spray testing done while under the extremes of pressure and temperature?</li> <li>(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed</li> </ul>	Yes Yes See TAB C(3)
those to be used for the plant? (11) Criteria regarding submergence satisfied? (12) Criteria regarding radiation satisfied?	Yes
<ul><li>(a) Was dose rate considered?</li><li>(b) Was beta radiation considered?</li></ul>	Yes
<ul><li>(13) Criteria regarding operability status/mode satisfied?</li><li>(14) Criteria regarding test failures or anomalies satisfied?</li></ul>	Yes

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TVA 19537 (OE-3-86)

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BIND	R NO. <u>WBNEQ-IZS-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEE	T <u>35</u> 0F <u>37</u>
BIND	ER TITLE EA 180 Series COMPUTED DRS DATE 8/14/86	KBN
Limit	t Switches Manufactured r 7/30/80 CHECKED RNB DATE 8/14/86	JDH
<u>AT CC.</u>		11/7/90
0.	SUMMARY_OF_REVIEW (Continued)	<u>Yes/No/NA</u>
	(15) Criteria regarding functional testing satisfied?	<u>Yes</u>
	(a) Does the test plan/report specify an acceptance criteria for equipment performed?	<u>Yes</u>
	(b) Was an initial base line test done to establish required performance characteristics?	<u>Yes</u>
	(c) Has the test/analysis demonstrated that performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	Yes
	(16) Criteria regarding instrument accuracy satisfied?	<u></u>
	(17) Test duration margin (1 hour + function time) satisfied?	Yes-See <u>TAB C(4)</u> R
	(a) Is the minimum specified operating time at least 1 hour?	<u>   Yes    </u>
	(b) If exception to the 1-hour minimum operating time was taken, was adequate justification provided?	<u>NA</u>
	(18) Criteria regarding synergistic effects satisfied?	Yes-See <u>TAB C(18)</u>
	(19) Criteria regarding margins satisfied?	Yes
	(20) Maintenance and surveillance requirements adequately identified?	<u>Yes</u>
P.	DISCUSSION 1. AGING - SECTION H(7)(b) - This device was a	subject_to
	100,200 actuation cycles during mechanical aging testing.	<u>This is</u>
	equivalent to an average of 208 actuations per month or	
	approximately 7 actuations per day over the 40 year life of	of the
	plant. This is judged to be in excess of the full open/c	lose
	actuation cycles the associated valves will be required to	operate_
	for normal plant (cont. on next page)	
	PAGE B-35 R4	

WBEP-0158Q-51

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	BINDER NO. <u>WBNEQ-IZS-001</u> PLAN	r <u>wbn</u>	UNIT(	5)1	SHEET <u></u>	37
	BINDER TITLE EA 180 Series	COMPUTED_	DRS	DATE	<u>8/14/86_J04</u>	
	Limit Switches Manufactured After 7/30/80	CHECKED	RNB	DATE	<u>8/14/86</u> <u>2/27</u>	
1					6/9/87	

P. <u>DISCUSSION</u> (Continued)

operation, surveillance, and maintenance. Therefore, the mechanical aging performed is adequate to demonstrate qualification over the 40 year life of the plant.

2. O(6)(e) - This device operates intermittently at relatively low voltages and currents which will not result in significant heat rise.

5. 0(12)(b) Beta dose is not required to be considered since this device is housed in a sealed metal enclosure which will prevent the passage of beta radiation through it and the entrance of beta - emitting particles into it.

|R1 3. Per TVA Drawing 47E235-42 (Lower Compartment), the unattenuated free field post-LOCA beta radiation dose contribution for inside primary containment is  $4.7 \times 10^8$  rads. The limit switch internals will not; however, be subject to the unattenuated free field beta dose. The switch housing assembly consists of three rectangular parts; the Bronwite alloy housing body (a corrosion resistant bronze casting alloy) and top and bottom stainless steel covers which are tightly bolted together. The minimum thickness is 1/8". Silicone rubber gaskets 0.060" thick are compressed between the housing and top and bottom covers at 20-inch pounds, creating a completely sealed unit that is water, oil, dust, and pressure tight, meeting NEMA type 1, 4, and 13 requirements. Also, all limit switches inside primary containment include a qualified seal. Therefore, all beta radiation sources will be external to the housing and subject to dose attenuation due to the housing. The beta dose to the switch internals will essentially be attenuated completely by a factor of 0.009 due to the minimum metal R1 thickness (reference TVA Calculation No. GENNAL3-002, TAB C, Section 19). The gap created by the gasket is sufficiently small to allow only a negligible fraction of the unattenuated 4-pi geometry free field dose to penetrate. However, as a conservatism to account for the gap (without taking credit for attenuation due to the silicone gasket), 10% of the unattenuated free field dose is added to the dose attenuated by the metal housing. Therefore, the 100-day beta dose to the switch internals is conservatively estimated_to be: 10% unattenuated contribution =  $0.10 (4.7 \times 10^8) = 4.7 \times 10^7$ , 100% attenuated contribution = 0.009  $(4.7 \times 10^8) = 4.23 \times 10^6$ . Total = 5.12 x 10⁷ rads beta.

BINDER NO. WBNEQ-IZS-001 PLAN	T <u>WBN</u>	UNIT(	s) <u>1</u>	SHEET	0F <u>37</u>
BINDER TITLE EA 180 Series	COMPUTED	DRS	DATE	R <u>1</u> R_ 8/14/86 <i>JDH</i>	
Limit Switches Manufactured	CHECKED	PNB	ח <b>מ</b> יד	8/11/186 26M	<u></u>
<u>AILEI // 50/00</u>	CHECKED		DAID	6/4/89	

#### P. <u>DISCUSSION</u> (Continued)

Additionally, the silicone gaskets themselves are not a concern. They receive significant geometric shielding due to being tightly compressed between the metal housing parts. Based on the switch geometry, the outer gasket material will be exposed to only a fraction of the unattenuated 4-pi geometry free field beta radiation dose. This unattenuated dose would be further reduced due to the angle of incidence into the narrow gap and attenuation due to the outer gasket material resulting in minimal dose to the innermost gasket material. The gasket width is approximately equal to the housing thickness (1/8 inch). Also, Target Rock Corp. has conducted tests on a similar silicone rubber gasket used in a similar application (reference EQ Binder WBNEQ-SOL-001, Section D, page D-29) and found that after exposure to 185 megarads of gamma radiation,

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**PAGE B-37 R1** 



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BINDER NO. WB NEQ-IZ S-001 PLANT WBN UNIT(S) 1 SHEET 37A OF 37 BINDER TITLE EAL 80 SERIES LIMIT COMPUTED MAD DATE 8/14/86 R R R R R R R R R R R R R R R R R R R
P. DISCUSSION (Continued) embrittlement had occurred in the excess gasket material extending beyond the mated parts. The gasket material actually trapped between the mated parts was still flexible. Likewise, in our application, the gaskets would not be a concern even should they become brittle due to their being tightly sandwiched between the housing and housing covers in a static application; especially considering that the outer part of the gasket (least important) would exhibit the more significant degradation. The limit switches also contain EPDM O-rings used for screw gaskets and the operating shaft seal. These O-rings are enclosed by the metal screws and shaft housing which shields them from the effects of beta radiation. In conclusion: The total combined beta and gamma radiation dose will equal 9.12 x 10 ⁷ rads TID (5.12 x 10 ⁷ beta + 4.0 x 10 ⁷ gamma) for accident conditions. The accident radiation plus the large lower compartment 40-year dose of 2.0 x 10 ⁷ rads equals a total radiation dose of 1.1 x 10 ⁸ rads TID. These switches were tested to 2.04 x 10 ⁸ rads which envelops our plant requirements. Therefore, they are gualified for our worst case gamma and beta radiation dose.

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	SHEET 1 OF 1
UNII(3)	R_2_R
BINDER NO. WENEQ-125-002	8/89 wat
TTUE FALSO SERIES LIMIT COMPUTED RITING	1/15/70
BINDER TITLE EATO BETWEEN RI/WCG DATE 9/2	8/89 JDA
$\frac{11CHES \text{ MARCHARGE}}{CHECKED} CHECKED $	1/25/10

TAB A

#### NOTES

- 1. Elevations shown are <u>Actual</u> elevations for equipment located in the Reactor Building and Floor elevations for equipment located outside the Reactor Building.
- 2. See Page B-1 for source of Category and Operating Time assignments.
- 3. A phase "A" containment isolation will cause the associated FCV to close. The limit switches must then open and remain open preventing solenoid reenergization and valve opening upon phase "A" containment isolation reset. This limit switch position indication is a PAM Bl variable and must be monitored to verify that containment isolation integrity is maintained for the duration of each event.

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#### PRINT DATE: 07/07/90

EQIS NUMBER UNIT DEVICE ID NO DESCRIPTION MO	AZMITH_ DEL_NUMBER	OCATION <u>Elev(1)</u> RM/RAD Contract	<u>CAT</u> (2)	<u>OPER_TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-ZS -061-0097A -B 1-FCV -061-0097/Z Inlet ISLN VALVE REACTOR BLDG POS SW EA	S1 -B 300 180-15302	772'10" UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -061-0097B -B 1-FCV -061-0097/Z Inlet ISLN VALVE REACTOR BLDG POS SN EA	S2 -B 300 180-15302	772 <b>" 5"</b> UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -061-0122A -B 1-FCV -061-0122/Z Outlet Isln valve reactor BLDG POS SH EA	S1 -B 300 180-15302	776' 2" UC 79K3-824495-1 ,	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -061-0122B -B 1-FCV -061-0122/Z Outlet ISLN valve reactor BLDG POS SW EA	52 -B 300 180-15302	775" 9" UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -061-0192A -B 1-FCV -061-0192/2 Glycol Sup ISLN VALVE POS SW EA	251 -B 294 180-15302	807' 7" UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.

R 2 PREPARER/DATE <u>D.R.S. 9/8/86</u> JWH 9-28-89 WCG 9-28-89 7-23-CHECKED/DATE N.A.P. 9/B/BG JON 1/23/90

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PRINT DATE: 07/07/90

EQIS NUMBER UNIT DEVICE ID NO. AZMI DESCRIPTION MODEL NUMBER	IH_ELEV(1) RM/RAD CONTRACT	<u>CAT</u> (2)	<u>OPER TIME</u>	<u>EVENT</u>	SAFETY_FUNCTION
WBN-1-ZS -061-0192B -B 1-FCV -061-0192/ZS2 -B 294 GLYCOL SUP ISLN VALVE POS SW EA180-15302	807' 1" UC 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -061-0194A -B 1-FCV -061-0194/ZS1 -B 300 Glycol Return ISLN Valve Pos SW EA180-15302	810• 37 UC 79K3-824495-1	A Á A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE Duration of Each event to Verify Containment Integrity.
WBN-1-ZS -061-0194B -B 1-FCV -061-0194/ZS2 -B 300 Glycol Return ISLN VALVE POS SW EA180-15302	809' 9" UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	VLV POS IND IS A PAM B1 VARIB AND MUST BE MONITORED FOR THE DURATION OF EACH EVENT TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -062-0072A -A 1-FCV -062-0072A/ZS1 -A 047 Regen HTX Letdown Isolation VLV EA180-31302	704 6 RW	A A A A	5MIN 5MIN 5MIN 15MIN 1HR	L MS/C FW/C RH/C CV/C	LS POS IND IS A PAM B1 AND D2 VARIABLE AND MUST BE MONITORED TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -062-0072B -A 1-FCV -062-0072B/ZS2 -A 047 Regen HTX Letdown Isolation VLV EA180-31302	704" 3" RW	A A A A	5MIN 5MIN 5MIN 15MIN 1HR	L MS/C FW/C RH/C CV/C	LS POS IND IS A PAM BI AND D2 Variable and must be monitored to verify containment integrity.

R_2_ R JWH 9-28-89 WCG 9-28-89 PREPARER/DATE D. R.S. 9/8/86 1-23-92 TOH T/23/90 CHECKED/DATE N.A.P. 9/8/86

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#### PRINT DATE: 07/07/90

EQIS_NUMBER DESCRIPTION	UNIT DEVICE ID NO. AZMI MODEL NUMBER	H ELEV(1) RM/RAD CONTRACT	<u>CAI</u> (2)	<u>OPER TIME</u>	<u>EVENT</u>	SAFETY FUNCTION
WBN-1-ZS -062-0073A -A Regen HTX Letdown Isolation	1-FCV -062-0073A/ZS1 -A 047 VLV EA180-31302	704 8 W RW	A A A A	5MIN 5MIN 5MIN 15MIN 1HR	L MS/C FW/C RH/C CV/C	LS POS IND IS A PAM B1 AND D2 VARIABLE AND MUST BE MONITORED TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -062-0073B -A Regen HTX Letdown Isolation	1-FCV -062-0073B/ZS2 -A 047   VLV EA180-11302	704• 3 <b>•</b> RW	A A A A	5MIN 5MIN 5MIN 15MIN 1HR	L MS/C FW/C RH/C CV/C	LS POS IND IS A PAM B1 AND D2 VARIABLE AND MUST BE MONITORED TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -062-0074A -A Regen HTX Letdown Isolation	1-FCV -062-0074A/ZS1 -A 050   VLV EA180-11302	704 "6" RW	A A A A	5MIN 5MIN 5MIN 15MIN 1HR	L MS/C FW/C RH/C CV/C	LS POS IND IS A PAM B1 AND D2 Variable and must be monitored to verify containment Integrity.
WBN-1-ZS -062-0074B -A Regen HTX Letdown Isolation	1-FCV -062-0074B/ZS2 -A 050 VLV EA180-31302	704" 4" RW	A A A A	5MIN 5MIN 5MIN 15MIN 1HR	L MS/C FW/C RH/C CV/C	LS POS IND IS A PAM B1 AND D2 VARIABLE AND MUST BE MONITORED TO VERIFY CONTAINMENT INTEGRITY.
WBN-1-ZS -063-0071A -A SIS CHECK VALVE LEAKTEST IS	1-FCV -063-0071/ZS1 -A 290 SLN POS SW EA180-31302	721' 5" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L Ms/C FW/C RH/C CV/C	PHASE A CNTMT ISO CAUSES ASSOC FCV TO CLOSE. LS OPENS & REMAINS OPEN PREVENTING SOL REENERGIZATION & VLV OPENING ON PHASE A CNTMT ISO RESET.

PREPARER/DATE D. R.S. 9/8/86 1-23-90 4-28-89 WCG CHECKED/DATE N.A.P. 9/8/86 JOH 9-28-89 7/23/90

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PRINT DATE: 07/07/90

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FOTS NUMBED	HNTT DEVICE ID NO.	AZMITH_	LOCATION	MZRAD (	CAT	OPER TIME	EVENI	SAFETY FUNCTION
DESCRIPTION	MOD	EL NUMBER	CONTRACT		(2)			
WBN-1-ZS -063-0071B -A SIS CHECK VALVE LEAKTEST	1-FCV -063-0071/ZS ISLN POS SW EA1	2 -A 290 80-31302	721' 6" A 79K3-82449	C4 5-1	A A A A	100D 100D 100D 1MO 1MO	L MS/C FW/C RH/C CV/C	PHASE A CNTMT ISO CAUSES ASSOC FCV TO CLOSE. LS OPENS & Remains open preventing sol Reenergization & VLV opening ON Phase A CNTMT ISO RESET.
WBN-1-ZS -063-0072A -A Cntmt Sump to RHR Pump A-	1-FCV -063-0072/ZS A VLV LIMIT SW EA1	51 -A 80-12302	685" / 79K3-82445	07' 95-1 1	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L RH⁄A AB AF CV⁄A	PROVIDE INTERLOCK TO ALLOW RHR Spray HDR VLVS TO BE MANUALLY Opened. Must Retain Pos For 30D Must Not Fail Such That RHR Spray HDR Can't be opened.
WBN-1-ZS -063-0072B -A CNTMT SUMP TO RHR PUMP A-	1-FCV -063-0072/ZS A VLV LIMIT SW EAI	52 -A 180-12301	685"	<b>\07 '</b>	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L RH/A AB AF CV/A	PROVIDE INTERLOCK TO ALLOW RHR Spray HDR VLVS TO BE MANUALLY Opened. Must retain Pos for 30D. Must Not Fail Such that RHR Spray HDR Can't be opened.
WBN-1-ZS -063-0073A -B Cntmt Sump to RHR Pump B-	1-FCV -063-0073/ZS B VLV LIMIT SW EA	51 -B 180-12302	685 <b>*</b> 79K3-8244	407 <b>'</b> 95-1	A A A A	100D 1M0 1M0 1M0 1M0 1M0	L RH/A Ab Af CV/A	PROVIDE INTERLOCK TO ALLOW RHR SPRAY HDR VLVS TO BE MANUALLY Opened. Must Retain Pos for 30d. Must Not Fail Such that RHR SPRAY HDR CAN'TBE OPENED.
WBN-1-ZS -063-0073B -B CNTMT SUMP TO RHR PUMP B-	1-FCV -063-0073/2 B VLV LIMIT SH EA	S2 -B 180-12302	685° 79K3-8244	A07 <b>'</b> 95-1	A A A A	100D 1m0 1m0 1m0 1m0	L RH/A Ab Af CV/A	PROVIDE INTERLOCK TO ALLOW RHR Spray HDR TO BE MANUALLY Opened. Must Retain Pos for 30D. Must Not Fail Such That RHR Spray HDR Can't be opened.

R_2_ R R [ PREPARER/DATE D. R.S. 9/8/86 JWH 9-28-89 was CHECKED/DATE N.A.P. 918186 7-23-5 WCG 9-28-89 IDA 7/23/90

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PRINT DATE: 07/07/90

EQIS NUMBER UNIT DI DESCRIPTION	EVICE ID NO, AZMITH MODEL NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	CAT (2)	OPER TIME	<u>EVENT</u>	SAFETY FUNCTION
WBN-1-ZS -068-0308A -B 1-FCV RCS FLOW CNTL VALVE WDS GA TO PRT I	-068-0308/ZS1 -B 317 Pos SH EA180-11302	724' 4" AC4 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.
WBN-1-ZS -068-0308B -B 1-FCV RCS Flow CNTL valve WDS ga to PRT (	-068-0308/ZS2 -B 317 Pos SW EA180-11302	723' AC4 79K3-824495-1	A A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.
WBN-1-ZS -072-0044 -A 1-ZS CNTMT SMP TO HDR A FCV STEM SW	-072-0044 -A EA180-12302	685' A07'	A/B B B B B	1WK/100D 30D 30D 30D 30D 30D	L RH/A CV/A AF AB	LS PROVIDES INTERLOCKS WHICH PREVENT THE OPENING OF THE FCV LS MUST NOT FAIL IN ORDER TO PREVENT INADVERTENT DRAINING OF THE RWST TO CNMT SUMP.
WBN-1-ZS -072-0045 -B 1-ZS CNTMT SMP TO HDR B FCV STEM SW	-072-0045 -B EA180-12302	685' A07' 79K3-824495-1	A∕B B B B B	1WK/100D 30D 30D 30D 30D	L RH/A ' CV/A AF AB	LS PROVIDES INTERLOCKS WHICH PREVENT THE OPENING OF THE FCV LS MUST NOT FAIL IN ORDER TO PREVENT INADVERTENT DRAINING OF THE RWST TO CNMT SUMP.
WBN-1-ZS -077-0009A -B 1-FCV RCDT PUMP DISCH FLOW CNTL VLV LIMI	-077-0009/ZS1 -B 280 IT SH EA180-15302	724" 1" AC4 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.

RI R_2__R_ PREPARER DATE D. R.S. 9/8/86 WCP 723-93 JOH JWH 9-28-89 CHECKED/DATE N.A.P. 9/8/86 WCG 9-28-89 7/23/90

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BINDER NO. : WBNEQ-IZS -002 Manufacturer : Namco Page 6 of 8

EQIS_NUMBER	UNIT DEVICE ID NO. AZMITH.	LOCATION <u>ELEV(1)</u> <u>RM/RAD</u> CONTRACT	CAT	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-ZS -077-0009B -B RCDT PUMP DISCH FLOW CNTL	1-FCV -077-0009/ZS2 -B 280 VLV LIMIT SH EA180-15302	723" 8" AC4 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.
WBN-1-ZS -077-0016A -B RCDT TO GAS ANALYZER FLOW	1-FCV -077-0016∕ZS1 -B 285 CNTL VLV LS EA180-15302	718" 8" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.
WBN-1-ZS -077-0016B -B RCDT TO GAS ANALYZER FLOW	1-FCV -077-0016/ZS2 -B 285 CNTL VLV LS EA180-15302	718' 3" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.
WBN-1-ZS -077-0018A -B RCDT TO VENT HDR FLOW CNTL	1-FCV -077-0018∕ZS1 -B 280 . VLV LIMIT SW EA180-15302	723' 9" AC4 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.
WBN-1-ZS -077-0018B -B RCDT TO VENT HDR FLOW CNTL	1-FCV -077-0018/ZS2 -B 280 . VLV LIMIT SW EA180-15302	723' 4" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3.

R 2 PREPARER/DATE D.R.S. 9/8/86 Nar TWH. 9-28-89 723-9 CHECKED/DATE N.A.P. 9/8/86 JOH wcg 9-28-89 7/23/90

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PRINT DATE: 07/07/90

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		LOCATION	CAT ODED TIME	EVENT	SAFETY EUNCTION
EQIS NUMBER DESCRIPTION	<u>UNIT DEVICE ID NO. AZMITH.</u> MODEL NUMBER	CONTRACT KHZ KAD	(2)	PAPIT	
<u> 28820 21. 1 2211,</u>					
WBN-1-ZS -090-0108 CNTMT BLDG LWR COMPT	-B I-FCV -090-0108/ZS -B 296 Mon ISLN VLV POS SW EA180-14302	736' 1" AC4	A/B 5MN/100D A/B 5MN/100D A/B 5MN/100D A/B 15MN/1M0 A/B 1HR/1M0	L MS/C FW/C RH/C CV/C	CNTMT VENT ISO SIG WILL CAUSE ASSOC FCV TO CLOSE. THE LS MUST OPEN & REMAIN OPEN PREVENTING SOL REENERGIZATION & VLV OPENING ON SIGNAL RESET.
WBN-1-ZS -090-0109 CNTMT BLDG LWR COMPT	-B 1-FCV -090-0109/ZS -B 297 Mon ISLN VLV POS SW EA180-14302	736"10" AC4	A/B 5MN/100D A/B 5MN/100D A/B 5MN/100D A/B 15MN/1MO A/B 1HR/1MO	L MS/C FW/C RH/C CV/C	CNTMT VENT ISD SIG WIL CAUSE ASSOC FCV TO CLOSE. THE LS MUST OPEN & REMAIN OPEN PREVENTING SOL REENERGIZATION & VLV OPENING ON SIGNAL RESET.
WBN-1-ZS -090-0110 CNTMT BLDG LWR COMPT	-B 1-FCV -090-0110/ZS -B 295 Mon ISLN VLV POS SW EA180-14302	7371 38 AC4	A/B 5MN/100D A/B 5MN/100D A/B 5MN/100D A/B 15MN/1MO A/B 1HR/1MO	L MS/C FW/C RH/C CV/C	CNTMT VENT ISO SIG WILL CAUSE Assoc FCV TO CLOSE. THE LS MUST OPEN & REMAIN OPEN Preventing Sol Reenergization & VLV OPENING ON SIGNAL RESET.
WBN-1-ZS -090-0114 . CNTMT BLDG UP COMPT N	-B 1-FCV -090-0114/ZS -B 296 10N ISLN VLV POS SW EA180-14302	736 4" AC4	A/B 5MN/100D A/B 5MN/100D A/B 5MN/100D A/B 15MN/1M0 A/B 1HR/1M0	L MS/C FW/C RH/C CV/C	CNTMT VENT ISO SIG WILL CAUSE ASSOC FCV TO CLOSE. THE LS MUST OPEN & REMAIN OPEN PREVENTING SOL REENERGIZATION & VLV OPENING ON SIGNAL RESET.
WBN-1-ZS -090-0115 CNTMT BLDG UP COMPT N	-B 1-FCV -090-0115/ZS -B 296 10N ISLN VLV POS SW EA180-14302	736' 3" AC4	A/B 5MN/100D A/B 5MN/100D A/B 5MN/100D A/B 15MN/1MO A/B 15MN/1MO	L MS/C FW/C RH/C CV/C	CNTMT VENT ISO SIG WILL CAUSE ASSOC FCV TO CLOSE. THE LS MUST OPEN & REMAIN OPEN PREVENTING SOL REENERGIZATION & VLV OPENING ON SIGNAL RESET.

R 2 R R PREPARER/DATE <u>D. R.S.</u> 9/8/86 CHECKED/DATE <u>N.A.P.</u> 9/8/86 <u>JWH</u> 9-28-89 NCT 7-23-82 CHECKED/DATE N.A.P. WCG 9-28-89 JOH 7/23/90

PAGE A-B RZ



PRINT DATE: 07/07/90

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BINDER NG. : WBNEQ-IZS -002 Manufacturer : Namco Page 8 of 8

## WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVICE ID NO, AZMITH DESCRIPTION MODEL NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	CAT OPER TIME EVE	NT SAFETY FUNCTION
WBN-1-ZS -090-0116 -B 1-FCV -090-0116/ZS -B 291 CNTMT BLDG UP COMPT MON ISLN VLV POS SW EA180-14302	736'11" AC4	A/B 5MN/100D L A/B 5MN/100D MS/ A/B 5MN/100D FW/ A/B 15MN/1M0 RH/ A/B 1HR/1M0 CV/	CNTMT VENT ISO SIG WILL CAUSE C ASSOC FCV TO CLOSE. THE LS C MUST OPEN & REMAIN OPEN C PREVENTING SOL REENERGIZATION C & VLV OPENING ON SIGNAL RESET.
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PAG' 9 R2

 R_I
 R_2
 R_

 PREPARER/DATE
 D. R. S. 9/8/86 TWH 4.2CF 

 CHECKED/DATE
 N. A. P. 9/8/86 TWH 4.2CF 

 9/8/86 7-23-90 7-23-90 

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-	BIND	ER NO. WBNEQ-IZS-002 PLANT WBN UNIT(S) 1 SHEET 1 OF 32 R 1 R 2
	BIND	ER TITLE EA 180 SERIES COMPUTED DRS DATE 5/22/86 JWH www MIT SWITCHES MANUFACTURED 9/28/89 7-23-70
	BE	TWEEN 9/5/78 AND 7/30/80         CHECKED NAP         DATE 5/23/86         WCG         TOH           9/28/89 7/23/96
)	A.	DOCUMENTATION
		Equipment Description Limit Switch
		Vendor/Manufacturer <u>NAMCO</u>
	a	Equipment Model No.(s) <u>See Tab A</u>
		·
		QUALIFICATION REPORTS
		(1) Title/Number/Revision <u>Qualification of <u>RIMS NEB 820318 202</u> NAMCO controls Limit Switch Model EA 180</u>
	·	to IEEE Standards 344 ('75), 323 ('74) and 382 ('72)
		Revision 1DATE9/5/78
		OTHER (ANALYSIS, VENDOR DATA, ETC.)
		WBNOSG4-012 R5 (B18 900531 252) Category & Operating Times-System 61
		WBNOSG4-013 K12 (B26 900327 200) Gategory & Operating Times-System 63 WBNOSG4-014 R11 (B26 900309 227) Category & Operating Times-System 63
		WBNOSG4-017 R11 (B18 900612 252) Sategory & Operating Times-System 72 WBNOSG4-019 R8 (B26 900612 251) Category & Operating Times-System 77
		WBNOSG4-026 R7 (B45 870227 426) Category & Operating Times-System 90 Vendor Telecon: TVA (L. P. Woodley) and NAMCO (J. R. Bendokaitis)
		on 10/22/85 - See TAB E (3) Watts Bar Environmental Drawing 47E235-41 R1
		Watts Bar Environmental Drawing 47E235-42 R2 Watts Bar Environmental Drawing 47E235-77 R1
		Material Aging Calculation WAC-293 (B44 900410 805) Reduction of Beta Dose by Sheet Steel WBNTSR-051 R0 (B26 891129 202)
	No	te: Documents listed above are used throughout this binder for
		equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need
		not be repeated in other sections of the binder. This listing includes only those documents which are essential to qualification
		binder referènces.
		PAGE B-1 R2

WBEP-0248Q



RZ

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BINDER NO. WBNEQ-IZS-002 PLANT WBN UNIT(S) 1 SHEET 2 OF 32
BINDER TITLE EA 180 SERIES COMPUTED DRS DATE 9/8/86
LIMIT SWITCHES MANUFACTURED
<u>9-15-</u> 9-15-

B. <u>CONCLUSION OF REVIEW</u> (Check only one block)

<u>x</u> Equipment Qualified

Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule

Equipment Qualification Not Established by Documentation

Equipment Not Qualified Based on Test Failures

# **OPEN ITEMS AND QUALIFICATION DEFICIENCIES**

Equipment is qualified pending resolution of open items identified in the front of the binder. 1. SCR WBNEEB8578 R3 - Gasket replacement

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#### COMMENTS/RECOMMENDATIONS

The required operating environments, normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.

	CHES MANUFACTURED BETWEEN 78 AND 7/30/80 CHECKED THE DATE 2/23/86	
<b>C.</b>	QUALIFICATION CRITERIA Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate Which Criteria is Applicable):	
	Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE323-1974)	
	X Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of 1E Bulletin No. 79- 01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)	
	JUSTIFICATION/COMMENTS Purchase contract is dated 1978 (see	
	Tab E(2)).	
	·	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET           IEEE 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	

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BINC SWIT 9/5/	DER TITLE EA180 SERIES LIMIT COMPUTED DATE 5/22/86 R R R
D.	QUALIFICATION METHODOLOGY
2	X Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
	X Test of Similar Items with Supporting Analysis
	Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
	Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis
	JUSTIFICATION/COMMENTS This test provides generic group qualifica-
	tion for EA180 series limit switches. Model EA180-11302 was
	selected for test purposes and is identical to models of the same
	number at Watts Bar Other models of the EA180 series have been
	number at watts bar. Other models of the matter series and series
	qualified with gupporting gupplementary testing and similarity
	qualified with supporting supplementary testing and similarity
	qualified with supporting supplementary testing and similarity discussions. See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity discussions. See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.
	qualified with supporting supplementary testing and similarity         discussions.       See Tab C(1) for similarity evaluation.

BINDER NO. WBNEQ-IZS-002 PLANT WBN	<u>VBNUNIT(S)_1SHEET_5_OF_32</u>
BINDER TITLE EA 180 SERIES COM	$\begin{array}{c} R = 1 \\ R = 1 \\ COMPUTED DRS \\ DATE 5/22/86 \\ Hat has have been been been been been been been be$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CH	CHECKED NAP DATE 5/23/86
	9-28-59

# E. EQUIPMENT DESCRIPTION

Is the equipment identified in the qualification documentation identical to the plant equipment which requires qualification (Yes/No/NA)? <u>Yes - See Comment</u> <u>Section D</u>.

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	<i>.</i>	Plant Device	Qualification Document	Reference
(1)	Equipment Type	Limit_Switch	Limit Switch	<u>TAB D, Page D-6</u>
(2)	Manufacturer	NAMCO	NAMCO	TAB D. Page D-6
(3)	Model Number(s)	See TAB A	<u>EA 180-11302</u>	TAB D. Page D-6
			. <u></u>	
ب				
(4)	Serial Number(s)	See Comment	See Comment	
الحب		. <u></u>		- <u></u>
•				
(5)	Identify Compone Unique checkshee attached:	nt <u>N/A</u> et	<u></u>	,

#### JUSTIFICATION/COMMENTS

These limit switches do not have serial numbers but are provided with date codes per the manufacturer's date code system described on EA 189-90051, page 1 of 3 (TAB H). These date codes are documented on field verification sheets found in TAB F. All limit switches in this binder have date codes between 9/5/78 and 7/30/80. Contract Certification of Compliance for these switches, found in TAB E(1), documents qualification to the test report found in TAB D.

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BINDER NO. WBNEQ-IZS-002 PLANT WBN	_UNIT(S)_1SHEET_6_OF_32
RINDER TITLE FA 180 SERIES COMPUTED DR	$\begin{array}{cccc} R \underline{1} & R \underline{-1} \\ R \underline{-1} & R \underline{-1}$
LIMIT SWITCHES MANUFACTURED	P = DATE 5-23-86  average
BEIWEEN 9/5//8 AND //30/80 CHECKED NA	9-28-89

# F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification documentation and/or evaluation and reference the source. Is the interface a requirement for our application (Yes/No)? (Note below.) If yes, enter requirement in QMDS, if no, provide justification.

		Plant Requirement?	Reference
Interface	Identify Interface	<u>(Yes/No)</u>	Test Report
Mounting Bolts	None	<u>No</u>	None
External Process Connections	None	No	None
Electrical Connections	None	No	None
Conduit Seals	Required	Yes	TAB D. Page D-7
Connector Seals	None	No	None
Orientation	None	No	None
Physical Configuration	None	No	None
Other	See Comments	See Comments	None

#### JUSTIFICATION/COMMENTS

Although it was not considered part of the qualification test, an operating lever is required for proper operation of the switch. The lever and roller should be of metal construction. Nylon rollers are not acceptable and are controlled through TVA's maintenance program (see TAB G).

PAGE B-6 R1

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E	INDER NO. WBNEQ-IZS-002 PLANT WBN	_ UNIT(S) <u>1</u> SHEET 7OF 32
Ē	INDER TITLE EA 180 SERIES COMPUTED DR	$\frac{R_{1}}{M_{12}} R_{1}$
	LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED NA	DATE <u>5-23-86</u> were
		9-28-89

#### G. TEST SEQUENCE

(1) Test Sequence: Was the test sequence established to simulate the accident environment in accordance with IEEE-323 (74), paragraph 6.3.2 (Yes/No/NA)? (Note below.)

		<u>Yes/No/NA</u>	Reference
(a)	Equipment inspected for damage	Yes	TAB D, Page D-7
(b)	Baseline performance measurements taken	Yes	TAB D. Page D-7
(c)	Equipment aged:		
	Thermal	Yes	TAB D, Page D-7
	Radiation	Yes	TAB D. Page D-8
	Wear	Yes	TAB D. Page D-7
(d)	Vibration/seismic testing conducted	Yes	TAB D, Page D-8
(e)	Design basis event (DBE) exposure	Yes	TAB D, Page D-12
(f)	Post-DBE exposure	Yes	TAB D. Page D-13
(g)	Final inspection and disassembly	Yes	TAB D. Page D-41

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(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (Yes/No/NA)? <u>Yes - See Comment (2)</u>

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately document (Yes/No/NA)? <u>No - See Comment (1)</u> (Reference: <u>TAB D, Appendix E</u>).

<u>JUSTIFICATION/COMMENTS</u> (1) Test equipment and calibration dates were recorded; however, test equipment accuracies were not documented in the test report. (2) The test report recorded seismic test data (TAB D, Appendix B) for a different EA 180 switch. However, the switch



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BINDER NO. WBNEQ-IZS-002 PLANT WBN	UNIT(S) <u>1</u> SHEET <u>8</u> OF <u>32</u>
BINDER TITLE EA 180 SERIES COMPUTED DR	$S \qquad DATE 5-22-86 \qquad \qquad$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED NA	P DATE <u>5-23-86</u>
	9-28-89

### G. <u>TEST SEQUENCE</u> (continued)

used throughout the test sequence was seismically conditioned by subjecting it to all vibrations contained in the seismic test (TAB D, pages D-11 and D-12).

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BINDER NO. WBNEQ-IZS-002 PLANT W	WBN	UNIT(S)_1	SHEET_9_OF_32
BINDER TITLE EA 180 SERIES	COMPUTED_DRS_	DATE	<u>R_1</u> R <u>5-22-86</u> <u>And</u> <u>K</u>
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80	CHECKED <u>NAP</u>	DATE	<u>5-23-86</u> wcr 9.25-49

#### H. AGING

(1) Was aging considered in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, pages D-7 & D-8</u>).

JUSTIFICATION/COMMENTS None

(2) Were the following effects considered in the aging program:

Aging Effect	<u>Yes/No/NA</u>	Reference	
Thermal aging	<u>    Yes     </u>	TAB D, Page D-7	
Radiation exposure	Yes	TAB D, Page D-8	
Vibration (non-seismic) aging	Yes	TAB D, Page D-35	RI
Operational (electrical/mechanical/ process) stress aging	Yes	TAB D, Page D-7	

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JUSTIFICATION/COMMENTS None

(3) Were all known synergistic effects which are believed to have a significant effect on equipment performance considered in the aging program (Yes/No/NA)? <u>N/A</u> (Reference: <u>See Comment</u>).

JUSTIFICATION/COMMENTS No known synergistic effects.

- (4) Thermal Aging:
  - a) Was thermal aging considered in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, page D-7</u>).

JUSTIFICATION/COMMENTS None

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BINDER NO. WBNEQ-IZS-002 PLANT WBN	UNIT(S) 1 SHEET 10 OF 32
BINDER TITLE <u>EA 180 SERIES</u> COMPUTEL LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED	$\begin{array}{c} R _ 1 \qquad R _ \\ \hline DRS \qquad DATE  5-22-86  \cancel{W} \\ \hline \cancel{H} \\ \hline \cancel{H} \\ \cancel$

- H. <u>AGING</u> (Continued)
  - (b) Were the materials susceptible to thermal aging degradation identified in the qualification program (Yes/No/NA)?  $\underline{x_{es}}$  (Reference:  $\underline{N/A}$ ).

JUSTIFICATION/COMMENTS See Material Analysis in TAB C(5).

(c) Was the basis for thermal aging identified in the qualification program (Yes/No/NA)? <u>Yes</u> Reference <u>TAB D Page D-7 footnote "+"</u>).

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- JUSTIFICATION/COMMENTS See Material Analysis in TAB C(5).
- (d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Page D-7, footnote "+"</u>).

Parameter	Plant Maximum Normal	<u>Test</u>	<u>Equivalent</u> 104°F/
Temperature	<u>104°F/110°F/120°F</u>	<u>N/A</u>	<u>110°F/120°F</u> 20.6/
Time	40 Years	<u>N/A</u>	<u>12.9/8.2 yrs</u>

<u>JUSTIFICATION/COMMENTS</u> *Qualified life established by Materials Analysis in TAB C(5).

(e) Was the Arrhenius methodolgy used for accelerated aging (Yes/No/NA)? <u>Yes</u> (Reference: <u>N/A</u>).

JUSTIFICATION/COMMENTS See Materials Analysis in TAB C(5).

(f) If activation energies were used for determining accelerated aging parameters, are they properly referenced to the source of the technical data (Yes/No/NA)? <u>Yes</u> (Reference: <u>N/A</u>).

JUSTIFICATION/COMMENTS See Materials Analysis in TAB C(5).

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BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S)_1	SHEET <u>11</u> OF <u>32</u> R 1 R
BINDER TITLE EA 180 SERIES	COMPUTED_DRS	DATE	5-22-86 (WH) 5
BETWEEN 9/5/78 AND 7/30/80	CHECKED <u>NAP</u>	DATE	<u>5-23-86</u> <u>wcx</u> 9-28-84

#### H. <u>AGING</u> (Continued)

(g) If a regression line was used for determining accelerated aging parameters, are test points or failure modes identified on the line (Yes/No/NA)? <u>N/A</u> (Reference: <u>N/A</u>).

JUSTIFICATION/COMMENTS None

(h) Was the equipment operated during the thermal aging (Yes/No/NA)? N/A (Reference: N/A).

<u>JUSTIFICATION/COMMENTS</u> Qualified life determined by Materials Analysis rather than accelerated aging test on assembled device.

- (5) Radiation Aging Exposure:
  - (a) Was radiation aging exposure considered in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Page D-8</u>). | RI

JUSTIFICATION/COMMENTS None

(b) Were the materials susceptible to radiation degradation identified in the qualification program (Yes/No/NA)? No (Reference: N/A).

<u>JUSTIFICATION/COMMENTS</u> Assembled test specimen irradiated to 204 megarads.

(c) Was the basis for radiation aging exposure identified in the gualification program (Yes/No/NA)? <u>No</u> (Reference: <u>N/A</u>).

JUSTIFICATION/COMMENTS 204 megarads exposed the switch to a greater radiation dose than expected for the serivce life of the switch plus accident conditions and margins.

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BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S)_1	SHEET 12 OF 32
BINDER TITLE EA 180 SERIES	COMPUTED DRS	DATE <u>5-22-</u>	R_1 R 86 (14) A
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80	CHECKED <u>NAP</u>	DATE <u>5-23-</u>	86 wc.»

#### H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Page D-18</u>).

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	<b>,</b> , ,	
	Plant normal ambient radiation dose (rd)	<u>2 x 10⁷</u>
	Test exposure dose (rd)	$2.04 \times 10^{8}$
		<u></u>
· .	Test exposure dose rate (rd/hr)	<u>.7 x 10⁶</u>
;	Test exposure source type (e.g., Co-60 gamma)	Co-60 Gamma
	(	
	JUSTIFICATION/COMMENTS None	

- (6) Vibration (non-seismic) Aging:

JUSTIFICATION/COMMENTS None

(b) Was the basis for vibration aging identified and justified in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>N/A</u>).

<u>JUSTIFICATION/COMMENTS</u> See TAB C(2)

1. Qualification program refers to the test report and any supplemental documentation including TVA analyses in TAB C of the Binder.

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PLUSEQ/248.21

BINDER NO. WBNEQ-IZS-002 PLANT WBN	UNIT(S)1SHEET_13_OF_32
BINDER TITLE EA 180 SERIES COMPUTED_	DRS DATE 5-22-86 CAU
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED	NAP DATE <u>5-23-86</u>

- H. AGING (Continued)
  - (7) Operational Stress Aging:
    - (a) Were the effects of electrical, mechanical, and process operational stresses induced during normal and abnormal operation adressed in the qualification program
       (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Pages D-50 & D-51</u>). |R)

JUSTIFICATION/COMMENTS None

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D. Pages D-7 & D-8</u>).

<u>JUSTIFICATION/COMMENTS</u> See Section P(1) for additional discussion.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (Yes/No/NA)? <u>Yes. See next sheet for discussion</u>. (Reference: <u>N/A</u>).

Qualified life (Document in QMDS) <u>40 years*</u>

JUSTIFICATION/COMMENTS *Through periodic refurbishment as defined in EA 189-90051 (TAB H).

(9) Were replacement intervals for the equipment or its components defined in the qualification program (Yes/No/NA)? <u>No</u> (Reference: <u>N/A</u>).

Replacement Intervals (Document in QMDS) See QMDS TAB G.

**PAGE B-13 R1** 

JUSTIFICATION/COMMENTS None

PLUSEQ/248.22

BINDER NO BINDER TIT SWITCHES 9/5/78 AN	<u>WBNEQ-12S-00</u> 2 PLANT <u>WBN</u> LE <u>EA180 SERIES LIMIT</u> COM MANUFACTURED BETWEEN D 7/30/80 CI	$\frac{1}{14} \text{ OF } \frac{32}{32}$
 	QUALIFIED LIFE H(8) The qual: by this binder is 40 years th:	ified life for all equipment covered
	further discussion on material	L analysis and Arrhenius methodology,
	The scheduled maintenance ser	vice times shown below comes directly
	from this Arrhenius curve. Max Normal Ambient	Service Time
	104°F 110°F 120°F	20.6 yrs. 12.9 yrs. 8.2 yrs.
	The QMDS section found in Tab	G will document the limit switches
	which require refurbishment a	nd the appropriate schedule.

BINDER	NO.	WBNEQ-IZS-002 PLANT WBN	UNIT	(S)1	SHEET	OF
BINDER SWIT( 9/5/7	TITLE CHES 1 78 ANI	EA 180 SERIES LIMIT MANUFACTURED BETWEEN D 7/30/80	COMPUTED	MG DATE	5/22/86	
I.	MATE	RIALS ANALYSIS	scentible to	Significant	: Thermal an	d/or
n	Radi: Mate:	ation Degradation and Aging rials Analysis)	g (Use Secti	on C of EQC	Binder for	Detailed
		Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Referen
	(a)	Ethylene Propylene/ O-Ring Shaft Seal	NA	NA	0.8eV	TAB C(
	(b)	Silicone rubber/Gasket	NA	NA ·	1.14eV	TAB C(
	(c)	Synthetic hydrocarbon grease with fluorocarbon/ lubricant	NA	NA	Unknown	TAB C(
	(d)	Aromatic ether based oil/ lubricant	NA	NA	Unknown	TAB C(
		Glass filled polyester (thermoset plastic)/ contact block				
	(e)	contact carrier	NA	NA	Unknown	TAB C(
	JUS	TIFICATION/COMMENTS <u>None</u>				
	<del></del>	مىلىيىنى بىرى يىرى يىرى يىرى يىرى يىرى يىرى يىر				<u></u>
						. <u></u>
		•				
		. D	AGE B-15			

BINDER NO. WBNEQ-IZS-002 PLANT_WBN	UNIT(S) <u>1</u> SHEET <u>16</u> OF <u>32</u>
BINDER TITLE EA 180 SERIES COMPUTED DR	$\begin{array}{c} R_1  R_\dots \\ S_\dots  DATE  \underline{5-29-86}  \underbrace{\bigcirc}_{4/2} \underbrace{\bigcirc}_{4/2}$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED NA	P DATE <u>5-29-86</u> were

- J. EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE <u>THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER</u> <u>ACCIDENT CONDITIONS</u>
  - (1) <u>Acceptance Criteria: Does the report/analysis identify the limiting values</u> of performance characteristics which would constitute failure if not met (Yes/No/NA)? <u>No</u> (Reference: <u>N/A</u>).

Identify Acceptance Criteria: See Section P(3).

(2) Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (Yes/No/NA)? <u>No</u> (Reference: <u>N/A</u>).

Identify baseline and functional testing: See Section P(3).

JUSTIFICATION/COMMENTS None

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Page D-43</u>).

JUSTIFICATION/COMMENTS None



PÀGE B-16 R1

RI

BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S) <u>1</u> SHEET <u>17</u> OF <u>32</u>
BINDER TITLE EA 180 SERIES	COMPUTED DRS	DATE 5-31-86
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80	CHECKED <u>NAP</u>	DATE <u>6-2-86</u> wers 9-28-89

#### J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE</u> <u>THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER</u> <u>ACCIDENT CONDITIONS</u> (Continued)

(4) Do the applied loads during baseline testing reflect normal operating conditions (Yes/No/NA)? <u>Yes</u> (Reference: <u>See Comment</u>).

JUSTIFICATION/COMMENTS See Comment J(5)(b)

(5) Identify electrical characteristics necessary to ensure the equipment performance specifications can be satisfied.

(a)	Parameter	Plant Normal Conditions	Reference
	Voltage	See Comment	_N/A
	Load	See Comment	<u>N/A</u>
·	Frequency	<u>N/A</u>	_N/A
	Accuracy	N/A	<u>N/A</u>
	Other(s)	<i>:</i>	
	Insulation Resis. minimum	See_Comment	_N/A
	<u>Closed contact</u> <u>open less than</u> <u>2 mili-sec during</u> <u>seismic test</u>	See_Comment	_N/A

RI

JUSTIFICATION/COMMENTS See Comment J(5)(b)

PAGE B-17 R1

_	
	BINDER NO. WBNEQ-IZS-002 PLANT_WEN UNIT(S) 1 SHEET 18 OF 32
	BINDER TITLE EA 180 SERIES COMPUTED DRS DATE 5-31-86 CAP 16
	BETWEEN $9/5/78$ AND $7/30/80$ CHECKED NAP DATE $6-2-86$ $\omega$
	9-28-84

#### J. EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS (Continued)

(b)	Parameter	Specific Accident Conditions	<u>Reference</u>	
	Voltage	See Comment	<u>N/A</u>	
	Load	See Comment	_N/A	
	Frequency	_N/A	<u>N/A</u>	
	Accuracy	N/A	<u>_N/A</u> R	١
	Other(s)			
`	<u>Insulation Resis.</u> minimum	See Comment	N/A	
ھہ	<u>Closed contact</u> <u>open less than</u> <u>2 mili-sec</u> <u>during seismic test</u>	<u>See Comment</u>	_N/1 Just /Connet	
	JUSTIFICATION/COMMENTS		F Selonment	
(c)	<u>Parameter</u> Voltage	<u>Demonstrated</u> <u>Conditions</u>	J S C <u>R</u> TAB D, Page D-22	
	Load	0.5 amp/100VDC 0.086 amp/100VDC	TAB D, Page D-38 TAB D, Page D-43	
	Frequency	N/A	<u>N/A</u> R	۱
	Accuracy	N/A	_N/A	
	Other(s)			
	Constant Resistance	50,000 ohms	TAB D, Page D-13	
	Contact Opening	2 mili-sec	TAB D, Page D-28	

PAGE B-18 R1

BINDER NO. WBNEQ-IZS-002 PLANT	WBN	T	UNIT(S)_1	SI	HEET <u>18a_</u> 0F <u>32</u>
BINDER TITLE EA 180 SERIES	COMPUTED_	DRS	DATE	R	1 R
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80	CHECKED	NAP	DATE	6-2-86	ues
					9-28-89

#### J. EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS (Continued)

(c) (Continued)

#### JUSTIFICATION/COMMENTS

The typical application of these limit switches is in control circuits. for example, solenoid valves. These circuits

Perise Por Below :

1. THE TYPICAL APPLICATION OF THESE LIMIT SUITCHES IS IN THE CONTROL LIRCUTT OF, FOR CHAMPLE, SULENDID UPERATED VALVES

the

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g

and

currents, the contact surfaces tend to be self-cleaning and/or the potential of the circuit is sufficient to break down films or oxides that might form on the contact faces.

BINDER SWITCHI	TITLE EAL 80 SERIES LIMIT COMPUTED DATE 5/31/R R. R. R. R. MANUFACTURED BETWEEN
9/5/70	AND 7730780 CHECKED DATE
J. ]	EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS (Continued)
9	JUSTIFICATION/COMMENTS (Continued)
	(3) Since standard design practices should prevent circuits from
	exceeding the UL ratings of contacts, the 100 VDC and 0.086 amp
	load used for testing is conservative and adequate considering
	items (1) and (2) above.
	While there are no plant specific requirements with regard to contac
	bounce and insulation resistance minimum, the values demonstrated ar
	considered adequate. At 50,000 ohms, there would be a slight leakage
	current of approximately 2.5 milliamps for a typical 125V circuit.
·	This small leakage current should not provide enough amperage to cau
	any adverse circuit operation.

LIMIT	ITLE <u>E</u> SWITCH	A 180 SERIES ES MANUFACTURED	COMPUTED_DRS	DATE <u>5-29</u>	R_1R -86 Awt 6 19/23/59	
BETWEE	N 9/5/	78 AND 7/30/80	CHECKED NAP	DATE <u>5-29</u>	-86 wcp 928.49	
K.1 <u>RE</u>	QUIRE	D OPERATING EN	VIRONMENT	- UPPER COMP.	ARTMENT	
Ret	erence	e Environmental Dra	wing No. <u>47</u>	E235-41		
ِ (1)	Norr	mal Max	(2) A	bnormal Max		
	(a)	Temperature (°F)	<u>_110</u> (a	a) Temperature	(°F) <u>120</u>	
	(b)	Pressure (psig)	<u>0.3</u> (t	o) Pressure (ps	ig) <u>0.3</u>	
•	(c)	Humidity (%)	<u>    80         (</u>	;) Humidity (%)	_90	
	[.] (d)	Radiation (rd)	$1 \times 10^{6}$ (0	d) Radiation (ro	i) <u>N/A</u>	1
(3)	Proc	cess Interfaces: No	ne.			
(4)	Stat	e anticipated occurr	ence frequenc	y and duration of uld exist for w	abnormal	
	per (Eff bind	excursion and wil ect on qualified ler WBNEQ-GEN-001.	l occur less life is negli )	than 1% of the gible. See gen	plant life. eric position in	
د. افد (5)	per (Eff bind	excursion and wil fect on qualified ler WBNEQ-GEN-001.	l occur less life is negli )	than 1% of the gible. See gen	plant life. eric position in	r
مر (5)	per (Eff bind Acci	excursion and wil fect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration	1 occur less life is negli ) r any combinat h, and profile):	than 1% of the gible. See gen	plant life. eric position in accident paramete	r
مہ (5)	per (Eff bind Acci inclu (a)	excursion and wil fect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration Temperature (°F)	1 occur less life is negli ) r any combinat a, and profile): 	than 1% of the gible. See gen ion of specified a Accident type	plant life. eric position in accident paramete LOCA/HELB	r 
یے (5)	per (Eff bind Acci inclu (a) (b)	excursion and wil fect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration Temperature (°F) Pressure (psig)	1 occur less life is negli ) r any combinat a, and profile): <u>161</u> <u>11.2</u>	than 1% of the gible. See gen ion of specified a Accident type Accident type	plant life. eric position in accident paramete <u>LOCA/HELB</u> <u>LOCA/HELB</u>	r
م (5)	Acci inclu (a) (b) (c)	excursion and wil fect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration Temperature (°F) Pressure (psig) Humidity (%)	1 occur less life is negli ) r any combinat a, and profile): <u>161</u> <u>11.2</u> <u>100</u>	than 1% of the gible. See gen Accident type Accident type Accident type	plant life. eric position in accident paramete <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u>	r 
م (5)	(Eff bind Acci inclu (a) (b) (c) (d)	excursion and wil fect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	1 occur less 1 ife is negli ) r any combinat a, and profile): <u>161</u> <u>11.2</u> <u>100</u> <u>4.7 x 10⁸ Be</u> <u>3.8 x 10⁷</u> Camma	than 1% of the gible. See gen Accident type Accident type Accident type Accident type ta Accident type	plant life. eric position in accident paramete <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u>	r     
م (5)	(Eff bind Acci inclu (a) (b) (c) (d) (e)	excursion and will fect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type	1 occur less 1 ife is negli ) r any combinat a, and profile): <u>161</u> <u>11.2</u> <u>100</u> <u>4.7 X 108</u> Be <u>3.8 x 107</u> Gamma *	than 1% of the gible. See gen Accident type Accident type Accident type ta Accident type Accident type Accident type	plant life. eric position in accident paramete <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u>	r    
(5) *0.184 of 8.3	per (Eff bind Acci inclu (a) (b) (c) (d) (c) (d) (e)	excursion and wil ect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd) Spray Type ar H ₃ B0 ₃ (2000 PPM 25°C. Spray durat	1 occur less 1 ife is negli r any combinat a, and profile): <u>161</u> <u>11.2</u> <u>100</u> <u>4.7 X 108</u> Be <u>3.8 x 107</u> Gamma * Boron), 0.03 ion is up to	than 1% of the gible. See gen Accident type Accident type Accident type Accident type Accident type Accident type Accident type Accident type 3 Molar NaOH re 30 days at a fl	plant life. eric position in accident paramete <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u> <u>LOCA/HELB</u> sulting in a PH ow rate equal to	r     

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PLUSEQ/248.27

BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S) 1 SHEET 21_OF 32
BINDER TITLE EA 180 SERIES	COMPUTED DRS	$\begin{array}{c} R \perp R \\ \hline R \\ DATE 5 - 29 - 86 \\ \hline 9 \\ \hline 9 \\ \hline 9 \\ \hline 1 \\ 1 \\$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80	CHECKED <u>NAP</u>	DATE <u>5-29-86</u>
DEIWEEN 9/3//0 AND //30/00	CHECKED NAP	DATE <u>3-23-60</u> 9-28-69

#### K.2 REQUIRED OPERATING ENVIRONMENT - LOWER COMPARTMENT

Refe	erence	e Environmental Dra	awing No. <u>47</u>	<u>/E235-42</u>		, 	4
(1)	Nor	mal Max	(2) Abnormal Max				
	(a)	Temperature (°F)	(	a) Ten	nperature (	(°F) <u>130</u>	
	(b)	Pressure (psig)	0.3 (	b) Pre:	ssure (psig	g) <u>0.3</u>	
	(c)	Humidity (%)	80(	c) Hun	nidity (%)	100	
	(d)	Radiation (rd)	<u>2 x 10⁷ (</u>	d) Rad	liation (rd)	<u>N/A</u>	
(3)	Proc	cess Interfaces: No	me.				
مر (5)	(Eff bind Acci	ect on qualified ler WBNEQ-GEN-001. ident (worst case fo uding peak, duration	r any combinant, and profile):	tion of sp	See gener	cident paramete	r
	(a)	Temperature (°F)		Accio	dent type	HELB	
	(b)	Pressure (psig)	11.2	Accio	dent type	LOCA/HELB	I
	(c)	Humidity (%)	100	Accio	lent type	LOCA/HELB	
	(d)	Radiation (rd)	<u>4.7 x 10⁸ Be</u> <u>4 x 10⁷ Gamm</u>	eta na Accio	dent type	LOCA	
	(e)	Spray Type	*	Accio	lent type	LOCA/HELB	

*0.1844 Molar  $H_3BO_3$  (2000 PPM Boron), 0.033 Molar NaOH resulting in a PH of 8.35 at 25°C. Spray duration is up to 30 days at a flow rate equal to 0.92 GPM per square foot of containment cross section.

RI

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BINDER NO. WBNEQ-IZS-002 PLANT WBN	UNIT(S) 1 SHEET 22 OF 32
BINDER TITLE EA 180 SERIES COMPUTE	$\begin{array}{c} R_1 \\ R_1 \\$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED	NAP DATE 5-23-86 WCP
DEIWEEN 9/5//8 AND //50/00 CHECKED	

Reference Environmental Drawing No. 47E235-77 (2) Abnormal Max Normal Max (1) Temperature (°F) 110 Temperature (°F) 104____ (a) (a) (b) Pressure (psig) ATM (b) Pressure (psig) ATM

REQUIRED OPERATING ENVIRONMENT: RHR Valve Rooms

(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>

RI

RI

- (d) Radiation (rd) <u>1.8 x10⁶</u> (d) Radiation (rd) <u>NA</u> |RI
- (3) Process Interfaces: None.
- (4) State anticipated occurrence frequency and duration of abnormal conditions: Abnormal conditions could exist for up to eight hours
   per excursion and will occur less than 1% of the plant life.
   (Effect on qualified life is negligible. See generic position in binder WBNEQ-GEN-001.)
- (5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

	(a)	Temperature (°F)	190	Accident type	LOCA	•
	(b)	Pressure (psig)	NA	Accident type	<u>NA</u>	
	(c)	Humidity (%)	. 90	Accident type	LOCA	
•	(d)	Radiation (rd)	<u>1 x 10</u> Z	Accident type	LOCA	RI
	(e)	Spray Type	_NA	Accident type	NA	

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PLUSEQ/248.29

K.3

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BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S)_1	
RINDER TITLE EA 180 SERIES	COMPTITED DRS	DATE 5-22	$\frac{R_1}{2-86} \frac{R_1}{M^A} R_{1/A}$
LIMIT SWITCHES MANUFACTURED			79/28107
BETWEEN 9/5/78 AND 7/30/80	CHECKED NAP	DATE $5-2$	9-25-59

#### K. <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.): For a cross-reference of equipment to environmental drawing, see Tab G

- (6) Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design basis accident conditions (Yes/No/NA)? <u>Yes</u> (Reference: <u>Tab C(8)</u>).
- (7) Subject to submergence (Yes/No/NA)? <u>No</u> (Reference: <u>see Section P(2)</u>).

Identify initiation time and duration of submergence: NA____

(8) Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference:

If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify:  $5.12 \times 10^7$  rads, See TAB B, Section P, Page B-32.

RI

(9) Special environmental calculations (temp., rad., etc.)

	Type		<u>RIMS No.</u>		
	None		, 		
			·		
•	······································				
	· •,				

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PLUSEQ/248.32

BINDER NO. WBNEQ-IZS-002 PLANT WBN	UNIT(S) <u>1</u> SHEET <u>24</u> OF <u>32</u>
BINDER TITLE EA 180 SERIES COMPUTE	$\begin{array}{c} R_1  R___\\ D_DRS  DATE  \underline{5-22-86}  \underline{4} \\ \underline{4} \\ \underline{4} \\ \underline{5} \\ \underline{5}$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78-AND 7/30/80 CHECKED	NAP DATE 5-23-86 WCM
	9-25-59

# L SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	<b>Specified</b>	<b>Demonstrated</b>	Reference
Operating Time	<u>100 davs</u>	<u>30 days</u>	<u>Tab C(6)</u>
Temperature (°F)	327	<u>349</u>	<u>TAB D, p D-45</u>
Pressure (psig)	11.2	83	<u>TAB D, p D-45</u>
Relative Humidity (%)	100	100	<u>TAB D, p D-45</u>
Chemical Spray*	<u>Tab C(3)</u>	<u>Tab C(3)</u>	<u>TAB D, p D-45</u>
Radiation (rd)**	6 x 10' <u>Gamma</u>	2.04 x 10 ⁰ <u>Gamma</u>	<u>TAB D, p D-39</u>
Submergence	<u>NA</u>	<u>NA</u>	<u>TAB B, Sec. P(2</u> )

RI

*Includes spray concentration, flowrate, density, duration, and pH.

**Enter 40-year integrated normal dose plus integrated accident dose and specify type.

(2) Comparison of worst-case profiles and margin assessment:

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	TAB C(9)
Pressure	Yes	See L(1)
Relative Humidity	Yes	See L(1)
Chemical Spray	Yes	TAB C(3)
Submergence	NA	TAB B, Sect. P(2)

JUSTIFICATION/COMMENTS None

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PLUSEQ/248.31

BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S) <u>1</u> SHEET <u>25</u> OF <u>32</u> R 1 R
BINDER TITLE EA 180 SERIES	COMPUTED DRS	DATE <u>5-22-86</u>
BETWEEN 9/5/78 AND 7/30/80	CHECKED <u>NAP</u>	DATE <u>5-23-86</u> <u>2007</u> 1-28-59

#### L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED</u> <u>CONDITIONS</u> (Continued)

(3) Were margins applied to the test parameters or otherwise addressed in the test program to assure that normal variation and uncertainties are accounted for? (Note margin applied, Yes/No/NA).

Suggested Margins per IEEE-323(74)	Margin Applied	<u>Yes/No/NA</u>
Temperature: +15 degrees F	+22	Yes
Pressure: +10% but no more than 10 psig	+71PSIG	Yes
Radiation: +10% of accident dose	$+1.4 \times 10^8$	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	<u>Tab_C(6)</u>	Yes
Voltage: ±10% of rated value	NA	<u>NA</u>
Frequency: ±5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	<u>2 Dwells</u>	Yes
Vibration: +10% added to acceleration	Comment _	Yes

JUSTIFICATION/COMMENTS: Per TVA Standard Specification - SS-E18. 12.01 - Seismic Requirements for Category I Electrical and I&C Equipment, these limit switches should be tested to 3 g's horizontal and 2 g's vertical. Since NAMCO verified in their test RN report (TAB D, Page D-11) that cross-coupling was not significant, RN the single axis test performed in each of the 3 axis to 9.52 g's was more than adequate.



PAGE B-25 R1

BINDER NO. WBNEQ-IZS-002 PLANT WBN	UNIT(S) 1 SHEET 26 OF 32
BINDER TITLE EA 180 SERIES COMPUTED DRS	$\begin{array}{c} R _ 1 \qquad R _ \\ \hline \\ B _ DATE  \underline{5-22-86}  \underline{4} + \underbrace{6}_{1/2} \underbrace{6}_{1/2}$
LIMIT SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED NAP	DATE <u>5-23-86</u> <u>wer</u>

#### M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference: <u>See Tab A</u>).

JUSTIFICATION/COMMENTS None

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D, Page D-50</u>).

IRI

RI

JUSTIFICATION/COMMENTS None

- (3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D. Page D-50</u>).
  - JUSTIFICATION/COMMENTS None

<u>JUSTIFICATION/COMMENTS</u> See Tab C(6)

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (Yes/No/NA)? <u>Yes</u> (Reference: <u>Tab C(4)</u>).

<u>JUSTIFICATION/COMMENTS</u> See Tab C(4)

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	DINUE	$R = R = \frac{5/32/n}{R} = R$
	BINDEF SWITC 9/5/	TITLE     EA 100 SERIES LIMIT     COMPUTED     Date     TUP       CHES MANUFACTURED BETWEEN     CHECKED     Map     Date     5/93/86
	N.	MAINTENANCE AND SURVEILLANCE
	•	Has the qualification program identified those surveillance, maintenance, and inspection parameters which are essential to maintain qualification and which aid in detecting degrading materials or equipment performance (yes/no/NA)? Yes (Enter all requirements in Section G of the EQP Binder - Qualification Maintenance Data Sheets).
		JUSTIFICATION/COMMENTS See QMDS - Tab G
1		PAGE R-27

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BIND	ER TITLE       EA180       SERIËS       LIMIT       COMPUTED       DMS       DAT         CHES       MANUFACTURED       BETWEEN       CHECKED       Nap       DAT         78       AND       7/30/80       CHECKED       Nap       DAT	re <u>5/2/86</u>
•		
0.	SUMMARY OF REVIEW	Yes/No/NA
ō	(1) Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	Yes
	(2) Any exceptions (i.e., sound reasons to the contrar taken to the specified qualification level adequately justified?	ry) <u>NA</u>
	(3) Choice of qualification methodology adequately justified?	Yes
	(4) If analysis was performed, complete the following:	:
	(a) Were equipment performance requirements identified?	NA
	(b) Were specific features and failure modes and effects analyzed?	NA
	(c) Were assumptions and mathematical models used together with appropriate justification for their use?	Yes-TAB C(5)
	(d) Were environmental parameters which affect equipment performance identified?	NA
	(5) Adequate similarity between equipment and test specimen established?	Yes
	(6) Aging degradation evaluated adequately?	Yes-Tab C(6)
	(a) Mechanical and/or cycle aging addressed?	Yes
	(b) Equipment aged to end of life condition prior application of DBE conditions?	to <u>Section P(6)</u>
	(c) Absence of preaging in test/analysis justifie	d? <u>Section P(6)</u>
	(d) Materials susceptible to thermal/radiation	Yes-Tab C(5)

PAGE <u>B-28</u>

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SWITCHES MANUFACTURED BETWEEN 9/5/78 AND 7/30/80 CHECKED MAD DATE 5/23/	<u>/ 26</u>
0. <u>SUMMARY OF REVIEW</u> (Continued)	Yes/No/NA Yes-See
(e) Normally operating state of device (e.g., normally energized) considered?	Sect.P(4)
(7) Qualified life or replacement schedule established?	Yes
(8) Criteria regarding temperature/pressure exposure satisfied?	Yes
(a) Peak temperature adequate	Yes
(b) Peak pressure adequate	Yes
(c) Duration adequate	Yes
(d) Required profile enveloped adequately	Yes
(e) Steam exposure adequate	Yes
(9) Criteria regarding test sequence satisfied?	Yes
(10) Criteria regarding spray satisfied?	Yes
(a) Was the spray testing done while under the extremes of pressure and temperature?	Yes
(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed those to be used for the plant?	TAB C(3)
(11) Criteria regarding submergence satisfied?	NA
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes Yes-See
(b) Was beta radiation considered?	Sect.P(5)
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies	Yes

PAGE B-29

BINDER TITL	EA180 SERIES LIMIT G	COMPUTED	$\frac{5}{2}$	<u>182 R _ R _ R _ R _ R _ R _ R _ R _ R _ R </u>
97 97 97 10 AN	7730700	CHECKED	DATE 2	· ·
0. <u>Summ</u>	ARY OF REVIEW (Continued)			Yes/No/NA
(15)	Criteria regarding functions	al testing sati	sfied?	Yes
	a) Does the test plan/report criteria for equipment	rt specify an a t performed?	cceptance	Yes-See Sect.P(3)
	(b) Was an initial base line required performance of	e test done to characteristics	establish ?	Yes
	(c) Has the test/analysis de	emonstrated tha	t performanc	e Yes
	(e.g., voltage, load f electrical characteris	Trequency, and stics) can be e	other nsured?	
(16)	Criteria regarding instrumen	nt accuracy sat	isfied?	NA
(17)	est duration margin (1 hour satisfied?	• + function tim	ne)	Yes
	a) Is the minimum specified 1 hour?	l operating time	e at least	Yes-TAB C(6)
	b) If exception to the 1-ho was taken, was adequat	our minimum ope ce justification	rating time n provided?	NA
(18)	Criteria regarding synergist	tic effects sat:	isfied?	NA
(19)	Criteria regarding margins s	satisfied?		Yes
(20) 1	faintenance and surveillance identified?	> requirements a	adequately	Yes
P. DISC	USSION			
<u>1. H</u>	7)(b) This device was subje	ect to 100,000 ;	actuation cy	cles during
mecha	nical aging testing. This	is equivalent	to an averag	e of 208
actua	tions per month or approxim	nately 7 actuat:	ions per day	over the 40-
year	life of the plant. This is	judged to be	in excess of	the full
open	close actuation cycles the	associated val	ves will be	required to
· ·				

PAGE	<u>B-30</u>
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BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S) 1 SHEET 31 OF 32
		R_1 R
BINDER TITLE EA 180 SERIES	COMPUTED DRS	DATE $5-29-86$ $(AV)$
LIMIT SWITCHES MANUFACTURED		DATE 5 20 96 1-162
BETWEEN 9/5//8 AND //30/80	CHECKED <u>NAP</u>	DATE <u>3-29-00</u>

#### P. <u>DISCUSSION</u>

operate for normal plant operation, surveillance, and maintenance. Therefore, the mechanical aging performed is adequate to demonstrate qualification over the 40-year life of the plant.

2. K(7) All equipment listed in Tab A has been evaluated for possible submergence due to flooding as defined by environmental drawings 47E235-42, 47E235-41 and 47E235-77 for Lower and Upper Containment and RN RHR Valve Rooms. No equipment will be submerged and required to operate.

3. J(1)&(2) Acceptance criteria - As discussed on TAB D, Pages D-13 and D-14 of the test report, the following performance results were observed.

1. Open contact resistance remained greater than 50 Kohms during all test phases.

RI

- 2. During seismic testing, the trip point varied by .107" or less for all units seismically.
- 3. The closed current remained within two milliamps of the specified load.

While the test report does not cite limiting values for performance characteristics, the performance observed as noted above is judged acceptable. This judgment by the evaluator is based on acceptance criteria documented in QTR No. 105, for NAMCO EA180's manufactured after 7/30/80. This report and acceptance criteria can be found in binder WBNEQ-IZS-001.

4. O(6)(e) This device operates intermittently at relatively low voltages and currents which will not result in significant heat rise.



PAGE B-31 R1

BINDER NO. WBNEQ-IZS-002 PLAN	WBN	UNIT(S)_1	SHEET <u>32</u> 0F <u>32</u>
			R <u>1</u> R <u>2</u>
BINDER TITLE EA 180 SERIES	COMPUTED_DRS	DATE <u>9-8-</u>	86 JWH west
LIMIT SWITCHES MANUFACTURED	-		9/28/89
BETWEEN 9/5/78 AND 7/30/80	_ CHECKED <u>NAP</u>	DATE <u>9-8-</u>	86 WCG JOH
·			9/28/897/23/90

#### P. <u>DISCUSSION</u> (Continued)

5. Per Watts Bar Environmental Drawing 47E235-41 and 47E235-42, the unattenuated free field post-LOCA beta radiation dose contribution for inside primary containment is 4.7 X 10⁸ rads. The limit switch internals will not, however, be subject to the unattenuated free field beta dose. The switch housing assembly consists of three rectangular parts; the Bronwite alloy housing body (a corrosion resistant bronze casting alloy) and top and bottom stainless steel covers which are tightly bolted together. The minimum thickness is 1/8". Silicone rubber gaskets 0.060" thick are compressed between the housing and top and bottom covers at 20-inch pounds, creating a completely sealed unit that is water, oil, dust, and pressure tight, meeting NEMA type 1, 4, and 13 requirements. Also, all limit switches inside primary containment include a qualified seal. Therefore, all beta radiation sources will be external to the housing and subject to dose attenuation due to the housing. The beta dose to the switch internals will essentially be attenuated completely by a factor of 0.009 due to the minimum metal thickness (reference TVA Calculation No. WBNTSR-051 (TAB C, Section 14). The gap created by the gasket is sufficiently small to allow only a negligible fraction of the unattenuated 4-pi geometry free field dose to penetrate. However, as a conservatism to account for the gap (without taking credit for attenuation due to the silicone gasket), 10% of the unattenuated free field dose is added to the dose attenuated by the metal housing.



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WBEP-0248Q

| R 2

R2

BINDER NO. WBNEQ-IZS-002 PLANT	WBN	UNIT(S) 1	SHEET 32AOF 32
· .	- 	I	R <u>1</u> R <u>2</u>
BINDER TITLE EA 180 SERIES	COMPUTED DRS	DATE <u>5-29-8</u>	36 JWH wer
LIMIT SWITCHES MANUFACTURED			9/28/89 7-23-90
BETWEEN 9/5/78 AND 7/30/80	CHECKED NAP	DATE <u>5-29-8</u>	36 WCG JOH
	<u> </u>		9/28/897/23/90

R2

#### P. <u>DISCUSSION</u> (Continued)

Therefore, the 100-day beta does to the switch internals is conservatively estimated to be 10% unattenuated contribution + 0.10  $(4.7 \times 10^8) = 4.7 \times 10^7$ , 100% attenuated contribution = 0.009  $(4.7 \times 10^8) = 4.23 \times 10^6$ . Total = 5.12 x 10⁷ rads beta. Additionally, the silicone gaskets themselves are not a concern. They receive significant geometric shielding due to being tightly compressed between the metal housing parts. Based on the switch geometry, the outer gasket material will be exposed to only a fraction of the unattenuated 4-pi geometry free field beta radiation dose. This unattenuated dose would be further reduced due to the angle of incidence into the narrow gap and attenuation due to the outer gasket material resulting in minimal dose to the innermost gasket material. The gasket width is approximately equal to the housing thickness (1/8 inch). Also, Target Rock Corp. has conducted tests on a similar silicone rubber gasket used in a similar application (reference EQ Binder WBNEQ-SOL-001, Section D, and found that after exposure to 185 megarads of gamma radiation, embrittlement had occurred in the excess gasket material extending beyond the mated parts. The gasket material actually trapped between the mated parts was still flexible. Likewise, in our application, the gaskets would not be a concern even should they become brittle due to their being tightly sandwiched between the housing and housing covers in a static application; especially considering that the outer part of the gasket (least important would exhibit the more significant

WBEP-0248Q

PAGE B-33 R2

BINDI SWIT 9/5/	In titleEA180 SERIES LIMIT COMPUTED DATE         CHES MANUFACTURED BETWEEN         78 AND 7/30/80         CHECKED         DATE         CHECKED         DATE         DATE								
Ρ.	DISCUSSION (Continued)								
ņ	degradation. The limit switches also contain EPDM O-rings used for								
	screw gaskets and the operating shaft seal. These O-rings are enclosed								
	by the metal screws and shaft housing which shields them from the								
	effects of beta radiation.								
	In conclusion: The total combined beta and gamma radiation dose will								
	equal 9.12 x $10^7$ rads TID (5.12 x $10^7$ beta + 4.0 x $10^7$ gamma) for								
	accident conditions. The accident radiation plus the large lower								
	compartment 40-year dose of 2.0 x 10 ⁷ rads equals a total radiation								
	dose of 1.1 x 10 ⁸ rads TID. These switches were tested to 2.04 x 10 ⁸								
	rads which envelops our plant requirements. Therefore, they are								
	qualified for our worst case gamma and beta radiation dose.								
	6. 0(6)(b)&(c) This equipment is being qualified to NUREG-0588,								
	Category II and therefore does not have to be aged to an end-of-life								
	condition prior to DBE testing. The qualified life was determined								
	by evaluating the potential for significant thermal aging degradation								
	of the nonmetallic materials of construction (See TAB C(5)).								

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SHEET 1_OF_1	
R ANT WBN UNIT(S) R 3 R	
WBNEQ-IZS-003 PLANI	•
BINDER NO DATE To/15/90	, - ,
TITLE EA740 LIMIT 00012 000 0000 0000 0000 0000 000000000	
ER ITTIM	
TCHES IMAN	
10/1/81	••
TAB A	14 ·
the conjument type	
c aggingent comprising the equipment	
Identification of equipment	
to all pages of this IAD A	
ma following notes apply to are ro	
The forment located in	
estual elevations for equipment located	
Elevations shown are <u>actual</u> of elevations for equipation all equip-	
the Reactor Building and IIIon Actual elevations for	
outside the Reactor Dullars TAB F.	<i>i</i> .
ment are documented in ind and the assign-	
months of Category and Operating -	
2 See Page B-4 for source of the	
ments.	
isolation signal will cause one preventing	
A containment vent isolate switches must them witches must	
to close. The limit and valve opening. Inc ther containment	
solenoid reenergization and solenoid changes around indication is a	
remain open to prevent the limit switch position the duration of	
vent isolation reset. The must be monitored for is maintained.	
PAM B and D2 variable and containment integrity	
each event to verily the	
tainment isolation signal will cure then open and	
A A phase "A" containment of The limit switches min valve opening	
associated FCVs to cicco solenoid reenergization The limit switch	
remain open preventing entainment isolation reset. Ind must be	
upon Phase "A" contrained a PAM B1 and D2 variable that	
position indication of each event to very	
monitored for the data maintained.	ed
containment integrity	
and remain open and remain open	
5. A Phase "A" contained init switches must chesh upon	n R3
FCVs to close. The reenergization and value limit switch positive	
preventing solution isolation reset. The monitored for the	
Phase "A" containment integrity is	
indication is a vent to verify that com	
duration of elements	
maintaineu.	

200-SZI





BINDER NO. : WBNEQ-IZS Manufacturer : Namco Page 1 of 2

#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

.

		-LOCATION	CAT	OPER TIME	EVENT	SAFETY FUNCTION	
EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO. AZMIIH. MODEL NUMBER	<u>CONTRACT</u>	(2)	<u>VI EN TALIA</u>	Fift		
WBN-1-ZS -030-0058A -B Incore Instr RM Exhaust Pos	1-ZS -030-0058∕1 -B 116 SWITCH EA74020000	739 <b>' IIR</b> 83KJ1-832128	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3	
WBN-1-ZS -030-0058B -B Incore Instr RM Exhaust Pos	1-ZS -030-0058/2 -B 117 Switch EA74020001	738' 5" IIR 83KJ1-832128	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 3	
WBN-1-ZS -031-0326B -A Incore Instr RM Chiller B C	1-FCV -031-0326/ZS2 -A 106 WR ISO VL LS EA74020100	745'10" ANN	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 4	
WBN-1-ZS -077-0127A -B Reactor Bldg Sump Disch Flo	1-ZS -077-0127А -В 290 W CNTL VLV LS EA74020120	720 <b>" 9"</b> AC4 84KJ5-836242	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 5.	
WBN-1-ZS -077-0127B -B Reactor Bldg Sump Disch Flo	1-ZS -077-0127B -B 290 DW CNTL VLV LS EA74020120	720 <b>" 9"</b> AC4 84KJ5-836242	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 5.	

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PAGE A-2 R3

R3



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PAGE A - 3 R3

PRINT DATE: 09/25/90

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BINDER NO. : WBNEQ-IZS -003 MANUFACTURER : NAMCO PAGE 2 OF 2

## WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO. Model Numb	AZMITHELEV(1)_RM/RAD ERCONTRACT	<u>CAT</u> OPER TIME (2)	EVENT SAFET	<u>FUNCTION</u>	
WBN-1-ZS -077-0128A -A Reactor Bldg Sump Disch FCV	1-ZS -077-0128A -A V LIMIT SH		A 100D A 1M0 A 1M0 A 1M0 A 1M0 A 1M0	L SEE N Rh/A CV/A Af Ab	)TE 5.	R3
WBN-1-2S -077-0128B -A Reactor Bldg Sump Disch FCV	1-ZS -077-0128В -А V LIMIT SW		A 100D A 1M0 A 1M0 A 1M0 A 1M0 A 1M0	L SEE N RH/A CV/A Af Ab	)TE 5.	
· · ·	· · · · · · · · · · · · · · · · · · ·		·			
		· · ·				
		<b>1</b>		•		
		PREPARER/DAT	E_WCG	9/9/86	R_JRRR	

CHECKED/DATE WEK/DLK

9/9/86

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	MANUFACTURED AFTER OCTOBER 1, 1981 CHECKED WELL DATE 6/13/86
	TAB B - CHECKLIST -Contents-
	A) Documentation
	B) Conclusion of Review
	C) Qualification Criteria
	D) Qualification Methodology
	E) Equipment Description
	F) Installation Interfaces
	G) Test Sequence
/	H) Aging
	I) Material Analysis
	J) Equipment Electrical Characteristics
	K) Required Operating Environment
	L) Summary Comparison of Test Conditions to Specified Conditions
	M) Operability Test Results
	N) Maintenance and Surveillance
	O) Summary of Review
	P) Discussion

PAGE B-2

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<u>10/1/81</u>	TITLE <u>EA/40 LIMIT</u> S MANUFACTURED AFTER	COMPUTED_WCG DATE <u>6/13/86</u> /57% 2/5/42 CHECKEDWBK DATE <u>6/13/86</u>
		<i>6~(3- 79</i>
A. <u>DUC</u>	MENIATION (SEE NOTE)	
Equi	.pment Description	Limit Switch
Vend	lor/Manufacturer	Namco
Equi	.pment Model No.(s)	See TAB A
		•
QUAI	IFICATION REPORTS (S	EE NOTE)
(1)	Title/Number/Revisi EA740 <u>Series Limit Switch</u>	on <u>Qualification of <u>RIMS_B71_860325_100</u> es/QTR111/Revision 1 <u>DATE_1/09/84</u></u>
(2)	Title/Number/Revisi 111 Qualification b <u>to Support the Chan</u> Carrier Material	on <u>Supplement 02 to QTR RIMS B70 870121 003</u> y Similarity Presentation <u>ge of Contact Block/</u> DATE <u>12/16/86</u>
(3)	Title/Number/Revisi of Series EA-740 Sw <u>Class IE Applicatio</u> IEEE Standards 323-	on <u>General QualificationRIMS_B37_900214_800</u> itches for use in Nuclear Power Plant <u>ns in Compliance with</u>
OTHE	R (ANALYSIS, VENDOR	DATA, ETC.)
Maha	: Unless specified the above report	otherwise, all references made herein are t (1).
NOCE		
MOCE		
MOCE	· · · ·	
NOCE		
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BINDER N	0. <u>WBNEQ-IZS-003</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>1a</u> OF <u>32</u> R_ <u>3</u> R
BINDER T <u>SWITCHES</u>	ITLE EA740 LIMIT COMPUTED WCG DATE <u>8/19/86 JDH</u> MANUFACTURED AFTER /º//s/90
10/1/81	CHECKED WBK DATE <u>8/19/86</u>
A. DOCU	MENTATION
OTHE	CR (ANALYSIS, VENDOR DATA, ETC.) (Continued)
. 1.	EPDM Activation Energy Analysis
2.	Material Aging Calculation Report, WAC-405
3.	Similarity Analysis
4.	OE Calculation WBNTSR-051 R0 (B26 891129 202), Reduction of Beta Dose by Sheet Steel.
5.	TVA Environmental Drawing No. 47E235-42 R2 and DCA P-04104-02-0, -03-0, -02-1, -05-0, and S-09715-02, -03, -04, -05, -13, -14, -15
6.	TVA Environmental Drawing No. 47E235-44 R1
7.	TVA Environmental Drawing No. 47E235-45 Rl and DCA P-04104-06-0, and S-09715-06, -07, -08, -09, -19
8.	Category and Operating Times Calculation, System 30, WBNOSG4-008 R16 (R26 900717 201)
9.	Category and Operating Times Calculation, System 31, WBNOSG4-009 R7 (B26 900309 233)
10.	Category and Operating Times Calculation, System 77, WBNOSG4-021 R5 (B18 900612 251)
Not	e: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the binder. This listing includes only those documents which are

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COMMENTS/RECOMMENDATIONS The required operating environments. COMMENTS/RECOMMENDATIONS The required operating environments. Normal and Accident, have been reviewed for each switch location in TABA. All switches are qualified to the worst cas
CONCLUSION OF REVIEW (Check only one block)     X Equipment Qualified (Pending acceptable resolution of open items)     Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule     Equipment Qualification Not Established by Documentation     Equipment Not Qualified Based on Test Failures     OPEN ITEMS AND QUALIFICATION DEFICIENCIES     Limit switches WBN-1-ZS-077-0128A-A and -0128B-A are to be     replaced by SCR WBNEEB8578 R5. See Open Item No. 1.     See open item sheets in front of binder for more details.     COMMENTS/RECOMMENDATIONS The required operating environments.     Normal and Accident, have been reviewed for each switch location     identified in TAB A. All switches are gualified to the worst cas
X       Equipment Qualified (Pending acceptable resolution of open items)        Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule        Equipment Qualification Not Established by Documentation        Equipment Not Qualified Based on Test Failures         OPEN ITEMS AND QUALIFICATION DEFICIENCIES         1.       Limit switches WBN-1-2S-077-0128A-A and -0128B-A are to be        replaced by SCR WENEEB8578 R5.       See Open Item No. 1.        See open item sheets in front of binder for more details.
<ul> <li>Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule</li> <li>Equipment Qualification Not Established by Documentation</li> <li>Equipment Not Qualified Based on Test Failures</li> <li>OPEN ITEMS AND QUALIFICATION DEFICIENCIES</li> <li>Limit switches WBN-1-2S-077-0128A-A and -0128B-A are to be</li> <li>replaced by SCR WBNEEB8578 R5. See Open Item No. 1.</li> <li>See open item sheets in front of binder for more details.</li> <li>COMMENTS/RECOMMENDATIONS The required operating environments.</li> <li>Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas</li> </ul>
Equipment Qualification Not Established by Documentation Equipment Not Qualified Based on Test Failures OPEN ITEMS AND QUALIFICATION DEFICIENCIES 1. Limit switches WEN-1-ZS-077-0128A-A and -0128B-A are to bereplaced by SCR WENEEB8578 R5. See Open Item No. 1See open item sheets in front of binder for more details COMMENTS/RECOMMENDATIONS The required operating environments,Normal and Accident, have been reviewed for each switch location
Equipment Not Qualified Based on Test Failures          OPEN ITEMS AND QUALIFICATION DEFICIENCIES         1. Limit switches WBN-1-ZS-077-0128A-A and -0128B-A are to be        replaced by SCR WBNEEB8578 R5. See Open Item No. 1.        See open item sheets in front of binder for more details.            COMMENTS/RECOMMENDATIONS The required operating environments.         Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
OPEN ITEMS AND QUALIFICATION DEFICIENCIES          1. Limit switches WEN-1-ZS-077-0128A-A and -0128B-A are to be         replaced by SCR WENEEB8578 R5. See Open Item No. 1.         See open item sheets in front of binder for more details.         COMMENTS/RECOMMENDATIONS The required operating environments,         Normal and Accident, have been reviewed for each switch location         identified in TAB A. All switches are qualified to the worst cas
1. Limit switches WBN-1-ZS-077-0128A-A and -0128B-A are to be replaced by SCR WBNEEB8578 R5. See Open Item No. 1. See open item sheets in front of binder for more details. COMMENTS/RECOMMENDATIONS The required operating environments. Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
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COMMENTS/RECOMMENDATIONS The required operating environments. Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
COMMENTS/RECOMMENDATIONS The required operating environments, Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
COMMENTS/RECOMMENDATIONS The required operating environments, Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
COMMENTS/RECOMMENDATIONS <u>The required operating environments</u> . Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
Normal and Accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst cas
identified in TAB A. All switches are qualified to the worst cas
combination of these environmental parameters. This includes con
sideration of peak levels and profiles.
•
·
·
·

BIND	Image: Plant work of the second se	)F 
MAN	UFACTURED AFTER 10/1/81 CHECKED MALE 0413/86	
C.	QUALIFICATION CRITERIA	
	Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate Which Criteria is Applicable):	
	X Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE323-1974)	
	Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of lE Bulletin No. 79- 01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)	
	JUSTIFICATION/COMMENTS None	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	
	IEEE STD. 323-1974	
	IEEE STD. 344-1975	
	IEEE STD. 382-1972 (Pressurized water reactor portion only)	
	<b>G</b> /	

BINI	DER NO. WBNEQ-IZS-003 PLANT WBN UNIT(S) 1 SHEET 4 OF 32 DER TITLE EA740 LIMIT SWITCHES COMPUTED $wcr y$ DATE $4-15-86$ R R R
MAI	NUFACTURED AFTER 10/1/81 CHECKED WITH DATE 6/13/86
D.	QUALIFICATION METHODOLOGY (Check only one block)
	X Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
	Test of Similar Items with Supporting Analysis
	Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
	Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis
	JUSTIFICATION/COMMENTS None
	· · · · · · · · · · · · · · · · · · ·
1	
	PAGE B-7

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BINDER NO. WBNEQ-IZS-003 PLANT	3N UNIT(S)	1 SHEET <u>5</u> OF <u>32</u>
BINDER TITLEEA740 LIMIT SWITCHES	COMPUTED 109	DATE 6/27/86 R R
MANUFACTURED AFTER 10/1/81	CHECKED WICK	DATE 421186

#### E. EQUIPMENT DESCRIPTION

Is the equipment identified in the qualification report identical to the plant equipment which requires qualification (yes/no/NA)?  $\frac{\text{Yes, See TAB}}{C, \text{Sect. 15.}}$ 

	· .	<u>Plant Device</u>	Qualification Document	Reference
(1)	Equipment Type	<u>Limit Switch</u>	Limit Switch	10-24, 10-55
(2)	Manufacturer	NAMCO	NAMCO	10-24, 10-55
(3)	Model Number(s)	EA74020000	EA74020000	pp. 3-4, <u>10-24,10-55</u>
		EA74020001	EA74020100	
		EA74020100		
		EA74020120		
(4)	Serial Number(s)	See Comments	See Comments	See Comments
(5)	Identify Component-	NA		
	Unique checksheet attached:	NA		
JUSI	TIFICATION/COMMENTS Th	<u>ese limit switch</u>	<u>es do not have s</u>	erial
numb	ers, but are provided	with date codes	per the manufact	urer's
date	code_system_described	on p. 3-35 of t	he Test Report.	Field
Ver	fication (TAB F) has v	erified that all	limit switches	covered
in 1	CAB A have data codes a	fter November 19	80 and are, ther	efore,
cove	ered by QTR 111 (TAB "D	").		

PAGE B-8-

BINDER NO. WBNEQ-IZS-003 PLAN	NT WBN	UNIT(S)	<u>l</u>	_ SHEET _ e	OF 32
	(0)(7)(7)			R_1	R_2
SWITCHES MANUFACTURED AFTER	_ COMPUTED_		ATE <u>6/</u>	<u>13/86 RHM</u> 5/5/8	/ <u>ock c/ide</u>
10/1/81	CHECKED	WBK D	ATE <u>6/</u>	<u>13/86 JDH</u>	KBN/240C
				5/5/8	9 6-15-90

## F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification documentation and/or evaluation and reference the source. Is the interface a requirement for our application (Yes/No)? (Note below.) If yes, enter requirement in QMDS, if no, provide justification.

Interface	Identify Interface	Plant Requirement? (Yes/No)	Reference Test Report
Mounting Bolts	<u>NA</u>	NA	<u>NA</u>
External Process Connections	NA	<u>NA</u> .	<u>NA</u>
Electrical Connections	<u>NA</u>	<u>NA</u>	NA
Conduit Seals	<u>See TAB C, Sect, 1</u>	Yes	p. 4-4.1 Sect. 4
Connector Seals	NA	<u>NA</u>	<u>NA</u>
Orientation	NA	<u>NA</u>	<u>NA</u>
Physical Configuration	<u>NA</u>	NA	<u>NA</u>
Other	See Comments	<u>NA</u>	NA
JUSTIFICATION/CON	MENTS <u>For installat</u>	ion_instructio	ons refer to

EA74990004 on page 4-4.1 of OTR 111. For Verification of Conduit seals see TAB F. Mounting and connection requirements are also addressed on page 11-11. Section 4.2.

Although, it was not considered part of the Qualification Test,R1an operating lever is required for proper operation of the switch.R1The lever and roller should be of metallic construction.Nylon rollers are not acceptable and are controlled through TVA'sMaintenance Program (see TAB G).R2

INDER NO	. WBN	EQ-IZS-003 PLANT _	WBN	UNIT(S)	) <u>1</u> SHEET <u>7</u> OF P 2 P
INDER TI WITCHES	TLE MANUF	EA740 LIMIT CO ACTURED AFTER	MPUTED_	WCG I	DATE 6/27/86 JDH/ 12 K (15/90
0/1/81		СН	ECKED	<u>WBK</u> I	DATE <u>6/27/86 KBN/264</u>
G. <u>Test</u>	SEQU	ENCE			
(1)	Test the para	Sequence: Was the accident environment graph 6.3.2 (Yes/No/	test se in acc NA)? (	quence est ordance wi Note below	tablished to simulate th IEEE-323 (74), v.)
				Yes/No/NA	Reference
	<b>(a)</b>	Equipment inspected for damage		Yes	p. 10-56, Sect. 10
	(b)	Baseline performanc measurements taken	e	Yes	p. 10-82
	(c)	Equipment aged:			
		Thermal		<u>     Yes</u>	p. 10-82
		Radiation		<u>Yes</u>	p. 10-84
		Wear		<u>    Yes    </u>	p. 10-83
:	(d)	Vibration/seismic t conducted	esting	Yes	p.10-85
	(e)	Design basis event exposure	(DBE)	Yes	pp. 10-89, through 10-95
	(f)	Post-DBE exposure		Yes	pp. 10-89, 10-93 through 10-98
	(g)	Final inspection an disassembly	đ	Yes	pp.6-3, & 10-99
(2)	Was sequ	the same piece of eq ence described in it	uipment em (1)	used thro above (Yes	oughout the test s/No/NA)? <u>Yes</u>
(3)	Have cali (Yes,	the test equipment, bration data been ap /No/NA)? <u>Yes (1)</u> (Ref	test e propria erence:	quipment a tely docum <u>See Comm</u>	accuracies, and ment ment (2)).
JUS	TIFIC	ATION/COMMENTS (1)	<u>Test eq</u>	uipment an	d calibration dates
<u>wer</u>	e reco	orded: however, test	<u>equipm</u>	<u>ent accura</u>	icies were not
<u>doc</u>	ument	ed in the test repor	t. (2)	See pages	20-104 through
<u>10-</u>	<u>106 fo</u>	or calibration data.	Test	equipment	is periodically
cal	ibrate	ed traceable to NBS	(see pa	ge 13-6).	

. <u>AGI</u>	<u>G</u>		
(1)	Was aging considered in the qualification pr (Yes/no/NA)? Yes (Reference P. 10-82 throu	ogram gh <u>10-83</u> ).	
	JUSTIFICATION/COMMENTS None		
(2)	Were the following effects considered in the	aging prog	ram:
	Aging Effect	<u>Yes/No/NA</u>	<u>Reference</u>
	Thermal aging	Yes	<u>P. 10-82</u>
	Radiation exposure	Yes	<u>P. 10-84</u>
	Vibration (non-seismic) aging	Yes	<u>P. 10-58</u>
	Operational (electrical/mechanical/process) stress aging	Yes	<u>P. 10-83</u>
	JUSTIFICATION/COMMENTS None		
(3)	Were all known synergistic effects which are significant effect on equipment performance program (yes/no/NA)? <u>Ye</u> s (Reference <u>See TAB</u>	believed to considered C, Section	o have a in the aging <u>17</u> ).
	JUSTIFICATION/COMMENTS None		
(4)	Thermal Aging:		
	(a) Was thermal aging considered in the qua (yes/no/NA)? <u>Ye</u> s (Reference <u>TAB "D",</u>	lification Section 10,	program P. 10-82 )
	JUSTIFICATION/COMMENTS None		

	BINDI MANU	ER TITLE EA	$\frac{1740 \text{ LIMIT SWITCHES}}{\text{AFTER 10/1/81}}  \text{COMPUTED } \frac{\omega c \vartheta}{\omega c \vartheta}  \text{DATE } \frac{8/2c/8c}{20/86}  \dots  \dots  \dots  \dots  \dots  \dots  \dots  \dots  \dots  $
	H.	AGING	
		(Ъ)	Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: See TAB "D", pp. 4-9 through 4-12 and 4-17).
			JUSTIFICATION/COMMENTS None
·		(c)	Was the basis for thermal aging identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB "D",Sect. 11, p. 11-19</u> )
			JUSTIFICATION/COMMENTS <u>None</u>
		(d)	Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference TAB "D", Sect. 4, p 4-9).
			<u>Parameter Plant Maximum Normal Test Equivalent</u>
		•	Temperature120°F248°F120°FTime40 years408 hrs7.8 years
			JUSTIFICATION/COMMENTS Qualified life is 40 years through
			periodic maintenance and replacement of the elastomeric comp-
		(e)	Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference TAB "D", Sect. 4.8 pp. 4-9 & 4-10).
			JUSTIFICATION/COMMENTS None
		(f)	If activation energies were used for determining accelerated aging parameters, are they properly referenced to the source of the technical data (yes/no/NA)? Yes (Reference TAB "D", Sect. 4.8, pp. 4-9 through 4-14).
			JUSTIFICATION/COMMENTS None

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	BINDER BINDER MANUF	NO. W TITLE	ED A	$\frac{-IZS-003}{PLANT WBN} UNIT(S) _1 SHEET _10 OF _$ $\frac{740 \text{ LIMIT SWITCHES}}{PLANT SWITCHES} COMPUTED \underbrace{\omega CY}_{DATE} DATE \underbrace{4/3/86}_{DATE} = 10/1/81 CHECKED \underbrace{MM}_{DATE} DATE \underbrace{4/13/86}_{DATE} = 10/1/81 CHECKED \underbrace{M}_{DATE} DATE \underbrace{4/13/86}_{DATE} = 10/1/81 CHECKED \underbrace{M}_{DATE} DATE \underbrace{4/13/86}_{DATE} = 10/1/81 CHECKED \underbrace{M}_{DATE} DATE \underbrace{4/13/86}_{DATE} = 10/1/81 CHECKED $				
	H. AGING (Continued)							
	÷		(g)	If a regression line was used for determining accelerated aging parameters, are test points or failure modes identified on the line (yes/no/NA)? <u>NA</u> (Reference <u>NA</u> ).				
				JUSTIFICATION/COMMENTS <u>Regression line not used</u> .				
			(h)	Was the equipment operated during the thermal aging (yes/no/NA)? <u>No</u> (Reference <u>TAB "D", Sect.10, p.10-58</u> ).				
				JUSTIFICATION/COMMENTS None				
		(5)	Radia	ation Aging Exposure:				
			(a)	Was radiaton aging exposure considered in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>Refer to TAB "D", Sect. 10</u>				
				<u>P. 10-84</u> ).				
		·		JUSTIFICATION/COMMENTS <u>None</u>				
	•		(Ъ)	Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>P. 4-15).</u>				
				JUSTIFICATION/COMMENTS <u>Assembled test specimen irradiated to</u> 204 Mrads.				
			(c)	Was the basis for excluding radiation aging exposure identified in the qualification program (yes/no/NA)? <u>NA</u> (Reference <u>NA).</u>				
				JUSTIFICATION/COMMENTS <u>Test included irradiation</u> .				
1								

SWITCHES PLANUE	ACTURED AFTER	515789 TTE 6/12/96 TDH
10/1/01		IE <u>0713700 30%</u> 5/5/89
H. AGING (Co	ntinued)	
(d)	Is the radiation test exposure dose as	nd dose rate
	acceptable (Yes/No/NA)? Yes (Refe Section 10, page 10-84	rence: <u>TAB D,</u> ).
	Plant normal ambient radiation	7 10 (worst case)
•	Test exposure dose (rd) <u>2.0</u>	$4 \times 10^8$
	Test exposure dose rate (rd/hr) <u>9.1</u>	x 10 ⁵ (average)
-	Test exposure source type (e.g., Co-60 gamma) <u>Cob</u>	alt 60 gamma
	JUSTIFICATION/COMMENTS None	
(6) Vibr	ation (non-seismic) Aging:	
(a)	Were the effects of non-seismic vibra normal and abnormal operation address qualification program* <u>Yes</u> (Repage 10-58	tion induced during ed in the ference: <u>TAB D,</u> ).
	JUSTIFICATION/COMMENTS Plant_induced	vibration simu-
	lation 1 x 10 cycles at 100Hz at 0.7	5g's per TAB D.
	page 10-58.	<u>,</u>
(b)	Was the basis for vibration aging iden in the qualification program (Yes/No/M (Reference: <u>page 11-23</u>	ntified and justified NA)? <u>Yes</u> ).
	JUSTIFICATION/COMMENTS None	
	• ·	
	•	

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<u></u>	CHECKED <u>WBK</u> DATE <u>6/13/86</u> <u>JDH</u>
H. AGIN	<u>VG</u> (Continued)
(7)	Operational Stress Aging:
	(a) Were the effects of electrical, mechanical, and process operational stresses induced during normal and abnormal operation adressed in the qualification program (Yes/No/NA)? Yes (Reference: <u>TAB "D", Section 10,</u> page 10-83
	JUSTIFICATION/COMMENTS None
	(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (Yes/No/NA)? <u>NA</u> (Reference: <u>NA</u>
	JUSTIFICATION/COMMENTS See TAB C. Section 11 for
	Additional Discussion
(8)	Was the qualified life of the equipment and its basis defined in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>See TAB "G"</u>
	Qualified life (Document in QMDS) <u>40* YRS</u>
	JUSTIFICATION/COMMENTS * Through periodic Refurbishment as
	defined in EA74920011 (p. 4-4.4); Refer also to TAB "C",
	Section 5.
	· · · · · · · · · · · · · · · · · · ·
·	
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SHEET _______ 3 OF _____32 BINDER NO. WBNEQ-IZS-003 PLANT WBN UNIT(S) 1 BINDER TITLE _____EA740 LIMIT SWITCHES COMPUTED WCM DATE 6/27/86 R _____R MANUFACTURED AFTER 10/1/81 CHECKED UM/ DATE 6/21/80 (9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? Yes (Reference See pp. 4-4.3 and 4-4.4). Replacement Intervals (Document in QMDS) See TAB "G" JUSTIFICATION/COMMENTS None_ PAGE B-16 EOP090.54 19627 105 2.26

UT1 WT1	)ER TITLE <u>EA740 LIMI</u> ICHES MANUFACTURED AFT	COMP	UTED <u>WCG</u>	DATE <u>6/13</u>	6/86_JDH/BK
0/1	L/81	CHEC	KED <u>WBK</u>	DATE <u>6/13</u>	6-15-10
•	MATERIALS ANALYSIS				
	Identification of Mat and/or Radiation Degr for Detailed Materia	terials Susc radation and ls Analysis)	eptible to Aging (Use •	Significant Section C o	Thermal of Binder
	Material/Property/Fun	Rad nction Thres	iation <u>hold Refere</u>	· Activa ence <u>Energy</u>	ntion <u>Reference</u>
a)	Silicone rubber/top & Bottom cover gasket EPDM/0-ring (lever sl	& <u>NA</u> haft)	NA	1.14eV	See 4-12 & <u>comment</u> (3)
b)	<u>O-ring (cover screws</u> Synthetic Polyphenvl	) <u> </u>	NA		<u>comment</u> (2)
c)	based grease/lubricar Thermoset plastic ashestos or glass-fi	nt <u>NA</u>	NA	comment(1)	<u>P.4–10</u>
d)	phenolic/contact bloc Contact Carrier	ck NA	<u>NA</u>	<u>0.827</u>	<u>comment</u> (4)
e)	Polyphenyl Ether based oil/lubricant	NA	NA	See <u>comment(1)</u>	See <u>comment</u> (1)
	JUSTIFICATION/COMMENT	rs		• ·	
	<ol> <li>The qualified life maintenance process maintenance requise lubrication.) Are required since grapplications (the Page 4-10).</li> </ol>	fe of the lu edure (refer irements doc n activation reases are d e synthetic	bricant is ence page 4 umented in energy for esigned for grease has	controlled b -11). (Sche TAB G requir the lubrica high temper a rating of	by the eduled red periodic ant was not rature 500°F [260°C]
	2. Namco has assumed elastomeric porti C, TVA considers The activation er data in TAB C, Se	i an activat ions of the this overly hergy of EPD ection 2.04K	ion energy limit switc conservati M is a cons c/m/mo	number of 0. h. As expla ve and will servative val	8eV for the ined in TAB use 0.94eV. ue based on

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BINDER NO. WBNEQ-IZS-003 PLAN	r WBN	UNIT(	S)]	SHEET	OF <u>32</u>
				R <u>1</u> R	2
BINDER TITLE EA740 LIMIT	COMPUTED_	WCG	DATE	<u>6/19/86_RHM</u>	JOH/92K
SWITCHES MANUFACTURED AFTER				5/5/89	6/15/90
10/1/81	CHECKED	WBK	DATE	<u>6/19/86_JDH</u>	KBN/JON
				5/5/89	6-15-90

#### JUSTIFICATION/COMMENTS

4. Namco test report QTR 111 documents the qualification of EA740 limit switches whose contact block and carrier material is asbestosfilled phenolic (RX490). However, in December 1986, the contact block material was changed to glass-filled phenolic (RX865) and the contact carrier material was changed to poly amide-imide (Torlon 4203L). This binder addresses both types of switches. Subsequently, an in-depth analysis was performed in Supplement 02 to QTR 111 (TAB D) comparing the properties of RX490 to RX865 and Torlon 4203L. As a result of this analysis, a different activation energy has been derived for the RX490 contact block (QTR 111 assigned an activation energy of 0.96eV to RX490). Activation energies of 0.834eV, 0.836eV, and 0.99eV were derived for the RX490, RX865, and Torlon 4203L materials, respectively (see Section 3.2.1 of Supplement 02). The data used to derive these values are in Appendix E (RX865) and Appendix F (RX490 and Torlon 4203L) of Supplement 02 to QTR 111. The derivation of 0.836eV for the RX865 R2 utilized only two of the four data points given in Appendix E (869 hours at 230°C and 5775 hours at 185°C). Using all four data points, TVA has derived an activation energy of 0.827eV for the RX865 (see calculation WAC-405 in TAB C). Because of the similarity between RX490 and RX865, 0.827eV will also be used as the activation energy for RX490.

QTR 111 aged the switches for 408 hours at 120°C. TVA considers this aging insufficient. In Namco test report QTR 140, an EA740 limit switch with a RX490 contact block was aged for 1049 hours at 120°C (see excerpts in TAB D) with no adverse effects. Because of its similarity to RX490, the RX865 contact block would also be able to withstand this aging. Therefore, the qualified life of the contact blocks on the switches in this binder was based on the aging parameters in QTR 140.



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MAN	UFACTI	JRED AFTER 10/1/81 CHECKED DATE 6/3/86
J.	EQU: SPE	IPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE CIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS
'n	(1)	Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure i not met (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D; Section 11, P. 11-27</u> ).
		Identify Acceptance Criteria: <u>See Section 11, P. 11-27.</u>
	-	
	(2)	Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D; Section 11, PP. 11-16</u> and 11-27).
		Identify baseline and functional testing: <u>Voltage-100VDC, current-</u> 0.086A, Insulation Resistance-50K ohms minimum, contacts must transfer
		during each switch operation, closed circuit shall not open for more
		than 2 milli-seconds during seismic testing.
		JUSTIFICATION/COMMENTS None
	(3)	Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? <u>Yes</u> (Reference <u>Section 10, p. 10-90</u> ).
		JUSTIFICATION/COMMENTS None

	1				· · · · · · · · · · · · · · · · · · ·				
•	BINDER NO	. <u>WBN</u>	EQ-1ZS-003	PLANT WB	<u>N</u> UN:	[T(S)1	SHEET	<u>    17   </u> 0	F <u>32</u>
	BINDER TI	TLE	EA740 LIMIT	COMPUT	ED <u>WCG</u>	DATE	<u>6/27/86 R</u>	HM J	CH/OIK
	SWITCHES	MANUF	ACTURED AFTE	R			5/	5/89	15/9</td
	10/1/81				D <u></u>	DAIE	<u>0/29/8</u> 6_J 5/	<u>5/89</u>	<u>5N / 749</u> , •15 - 90
	T POUT								
	J. <u>EQUI</u> PERF	ORMAN	CE SPECIFICAL	CHARACTERIST TIONS CAN BE	SATISFI	<u>SSARY TO</u> ED UNDER	ENSURE TH ACCIDENT	<u>E</u> Condtt	TONS
,	(Con	tinue	ed)					,	<u></u>
	(4)	Do t	he applied 1	oads during	baseline	testing	reflect n	ormal	
		oper	ating condit	ions (Yes/No	/NA)? Y	es (Ref	erence:	TAB D,	
	N	Sect	<u>10n 5.6, pp</u>	<u>5-8 thru 5.9</u>	, <u>,,</u> , ,, ,,	····		_	).
		JUSI	IFICATION/CO	MMENTS <u>None</u>			• 		
		- <u></u>			<u> </u>				
	(5)	Iden	tify electri	cal characte	ristics 1	necessary	to ensur	e the	
		equi	pment perfor	mance specif	ications	can be s	atisfied.		
		(a)	<u>Parameter</u>	<u>Plant Norm</u>	al Condi	tions	Refer	ence	
			Voltage	125V DC	,		NT A		I
			TUTUE	1254 00		<u></u>	<u>IIA</u>		R
			Load	<u> </u>			NA		-
			Frequency	NA			NA		
			A compacy	NT A		-	NT A		
			Accuracy	<u>114</u>			MA		
	•	•	Other(s)						
			•						
			· · · · · · · · · · · · · · · · · · ·		· · ·		- <u></u>	<u></u>	
			JUSTIFICATI	ON/COMMENTS	<u>See J(5)</u>	(b) comm	ents, page	<u>s</u>	
			B-20A and B-	-21.			•	<b></b>	'  R2
		• .							•
							<u> </u>		
			·····						
							••••••••••••••••••••••••••••••••••••••		
				DACE	B 20 D2	)			
7	WEED 01420			PAGE	B-20 R2	-		•	

	BINDER N	0WBNEQ-IZS-003	PLANTV	VBN UNIT	(S) <u>1</u>	SHEETR_3	<u>17a</u> OF <u>32</u> R
	BINDER T	ITLE EA740 LIMI		JTED <u>WCG</u>	DATE	6/27/86 J	04
	<u>SWITCHES</u> 10/1/81	MANUFACTURED AF	CHECI	CED <u>WBK</u>	DATE	<u>6/29/8</u> 6	74 0/18/90
			CUADACTEDIS	TTCS NECESS		INSURE THE	<u> </u>
:	J. <u>EQUI</u> <u>PERF</u> (Con	<u>'ORMANCE SPECIFIC</u> tinued)	ATIONS CAN B	E SATISFIED	UNDER A	CCIDENT CO	<u>ONDITIONS</u>
	(5)( <b>b</b> )	Parameter	Specific Ac	cident Cond	itions	Refer	ence
		Voltage	125V DC			<u>NA</u>	
		Load	<u>    5  amps     </u>			NA	· .
		Frequency	<u>NA</u>			NA	
		Accuracy	NA			NA	
		Other(s)					
					<u></u>		··
		JUSTIFICATION/	COMMENTS				
	1.	The typical appl circuits of, for nameplate rating AC and 5 amps at switches under r	lication of t r example, so gs of the swi t 125V DC) en normal and ac	hese limit lenoid oper tches being velop the r cident cond	switche rated va g bought required litions.	s is in th lves. The (20 amps loads of	e control UL and R3 @ 125V   the
	2.	The demonstrated adequate for the	i load of 0.5 e following r	amps @ 100 easons:	OV DC is	considere	d
		a. Low voltage therefore, j	and currents provide litt]	may not bi contact :	reak dow surface	n the film renewal.	/oxide;
		b. When switch the contact potential of or oxides th	es are operat surfaces ter f the circuit hat might for	ed at rated ad to be se is suffic m on the co	d voltag lf-clean ient to ontact f	e and curr ing and/or break down aces.	ent, the films
			,				
	1						

PAGE B-20A R3

WBEP - 0142Q

BINDER NO. WBNEQ-IZS-003 PLAN	r wbn	UNIT(S)	)1	SHEET <u>18</u> OF <u>32</u>
BINDER TITLE <u>EA740 LIMIT</u> SWITCHES MANUFACTURED AFTER	COMPUTED_	WCG	DATE	R_2_R 6/27/86 6/27/86
10/1/81	CHECKED	WBK	DATE	6/29/86 KBN/202

J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE</u> <u>PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS</u> (Continued)

(5)(b)(2) JUSTIFICATION/COMMENTS (Continued)

- c. Since TVA's standard design practices prevent circuits from exceeding the UL ratings of contacts, the 100V DC and 0.086 amp load used for testing is conservative and adequate considering items a and b above.
- 3. At the demonstrated insulation resistance value of 50 Megohms, there would be a slight leakage current of approximately 2.5 R2 milliamps for a typical 125V circuit. This small leakage current should not provide enough amperage to cause any adverse circuit operation.
- 4. While there are no plant-specific requirements with regard to contact bounce/circuit opening, it was demonstrated that none occurred during seismic and vibration testing of the limit switch.



10/1/81		CHECKED WBK DATE 6	5/27/86 JDH K
J. <u>EQUI</u> <u>PERF</u> (Con	PMENT ELECTRICAL ORMANCE SPECIFIC	CHARACTERISTICS NECESSARY TO E ATIONS CAN BE SATISFIED UNDER A	INSURE THE ACCIDENT CONDIT
(5)(c)	<u>Parameter</u>	Demonstrated Conditions	
	Voltage	100V DC	<u>TAB D. p. 5-</u>
	Load	0.5 amps	<u>TAB D, p. 5-</u>
	Frequency	<u>NA</u>	<u>NA</u>
	Accuracy	<u>NA</u>	NA
	Other(s)		
	Minimum Insulation <u>Resistanc</u> e	50 megohms	pp. 10-82 th 10-85 and 10-90
	Closed Contact Open <2ms durin <u>seismic t</u> ests	g <u>&lt;2ms</u>	p. 5-11, sec 5.10, p. 10- (chart)
	JUSTIFICATION/C	OMMENTS None	
		·····	
		······································	<del></del>
		· · · ·	

K.1 <u>REQ</u> Ref	<u>UIRED</u>	OPERATING ENVIRON Environmental Dr	<u>MENT</u> - Lower awing No. <u>47E2</u>	Compartment		R1
(1)	Norm	al Max	(2) Ab	normal Max		<u> </u>
	(a)	Temperature (°F)	<u>120</u> (a	) Temperature	(°F) <u>130</u>	
	(b) [.]	Pressure (psig)	<u>0.3</u> (b	) Pressure (p	sig) <u>0.3</u>	
	(c)	Humidity (%)	<u>80</u> (c	) Humidity (%	) <u>100</u>	<u> </u>
	(d)	Radiation (rd)	$\frac{7}{2 \times 10}$ (d	) Radiation (	rd) <u>NA</u>	R1
(3)	Proc	ess Interfaces:	None			,
	0 + - +		urrence freque	oow and durati	on of abn	ormal
(4)	cond:	e anticipated occ itions: <u>Abnormal</u>	conditions con	uld exist up t	o eight h	ours
(4)	cond:	e anticipated occ itions: <u>Abnormal</u> excursion and wil	<u>conditions conditions conditions to the second sec</u>	han 1% of the	o eight h	ours e
(4)	cond: <u>per (</u> (effe	e anticipated occ itions: <u>Abnormal</u> excursion and wil ect on qualified	L occur less the life is neglige	han 1% of the	<u>o eight h</u> plant lif eric posi	ours e tion
(4)	cond <u>per (</u> (effe	e anticipated occ itions: <u>Abnormal</u> excursion and wil ect on qualified inder No. WBNEQ-G	L occur less the life is negliger	han 1% of the	o eight h plant lif eric posi	e
(4)	cond per ( (eff in B: Accid parar	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>ect on qualified</u> <u>inder No. WBNEO-G</u> dent (worst case neter including p	L occur less the life is neglige EN-001). for any combination,	han 1% of the han 1% of the ible - see gen ation of speci and profile):	<u>o eight h</u> <u>plant lif</u> <u>eric posi</u> fied acci	ours e tion dent
(4)	cond <u>per (</u> (eff in B; Accia paran (a)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>ect on qualified</u> <u>inder No. WBNEO-G</u> dent (worst case meter including p Temperature (°F)	Life is neglig EN-001). for any combination, 327	han 1% of the han 1% of the ible - see gen ation of speci and profile): Accident typ	o eight h plant lif eric posi fied acci e <u>LOCA/HE</u>	ours e tion dent LB
(4)	cond per ( (eff( in B; Accid paran (a) (b)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>ect on qualified</u> <u>inder No. WBNEQ-G</u> dent (worst case meter including p Temperature (°F) Pressure (psig)	Life is neglig EN-001). for any combination, 327	han 1% of the han 1% of the ible - see gen ation of speci and profile): Accident typ Accident typ	o eight h <u>plant lif</u> eric posi fied acci e <u>LOCA/HE</u> e <u>LOCA/HE</u>	e tion dent LB
(4)	cond per ( (eff( in B; Accia paran (a) (b) (c)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>ect on qualified</u> <u>inder No. WBNEQ-G</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	Life is neglig <u>EN-001).</u> for any combination, <u>327</u> <u>11.2</u> <u>100</u>	han 1% of the han 1% of the ible - see gen ation of speci and profile): Accident typ Accident typ	o eight h plant lif eric posi fied acci e LOCA/HE e LOCA/HE	ours e dent LBR1 LBR1
(4)	cond <u>per</u> <u>(eff</u> <u>in B;</u> Accid paran (a) (b) (c) (d)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>ect on qualified</u> <u>inder No. WBNEQ-G</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	Life is neglig <u>Life is neglig</u> <u>EN-001).</u> for any combination, <u>327</u> <u>11.2</u> <u>100</u> <u>4.7x107</u> Beta <u>4x10</u> Gamma	han 1% of the han 1% of the ible - see gen ation of speci and profile): Accident typ Accident typ Accident typ	o eight h plant lif eric posi fied acci e LOCA/HE e LOCA/HE e LOCA/HE	ours e dent LBR1 LBR1

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• • •

<u>SW1</u> 10/	ER TITLE EA740 LIMIT COMPUTED WCG DATE 8/19/86 254 CHES MANUFACTURED AFTER /81 CHECKED WBK DATE 8/19/86 JDH 5/5/89	
к.	REQUIRED OPERATING ENVIRONMENT - Annulus Reference Environmental Drawing No. <u>47E235-44</u>	_
	(1) Normal Max (2) Abnormal Max	-
	(a) Temperature (°F) <u>110</u> (a) Temperature (°F) <u>120</u>	-
	(b) Pressure (psig) <u>ATM(-)</u> (b) Pressure (psig) <u>ATM(-)</u>	-
	(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>	-
	(d) Radiation (rd) $\frac{1.0 \times 10^6}{1.0 \times 10^6}$ (d) Radiation (rd) NA	_
	(3) Process Interfaces: <u>None</u>	-
	(4) State anticipated occurrence frequency and duration of abnorma conditions: <u>Abnormal conditions could exist up to eight hours</u>	al 5
)	per excursion and will occur less than 1% of the plant life	-
	(affect an explicit life is realisible and exercise position	
	<u>(effect on qualified file is negligible - see generic position</u>	1
	in Binder No. WBNEO-GEN-001).	1
	<ul> <li>(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):</li> </ul>	1
	<ul> <li>(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):</li> <li>(a) Temperature (°F) <u>133.7</u> Accident type <u>LOCA/HELB</u></li> </ul>	<u>-</u>
	<ul> <li>(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):</li> <li>(a) Temperature (°F) <u>133.7</u> Accident type <u>LOCA/HELB</u></li> <li>(b) Pressure (psig) <u>ATM(-)</u> Accident type <u>NA</u></li> </ul>	<u>-</u> -
	<pre>(effect on qualified fife is negligible - see generic position in Binder No. WBNEO-GEN-001). (5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile): (a) Temperature (°F) <u>133.7</u> Accident type <u>LOCA/HELB</u> (b) Pressure (psig) <u>ATM(-)</u> Accident type <u>NA</u> (c) Humidity (%) <u>61</u> Accident type <u>LOCA/HELB</u></pre>	
	<ul> <li>(effect on qualified fire is negligible - see generic position in Binder No. WBNEQ-GEN-001).</li> <li>(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile): <ul> <li>(a) Temperature (°F) 133.7</li> <li>Accident type LOCA/HELB</li> <li>(b) Pressure (psig) ATM(-)</li> <li>Accident type NA</li> <li>(c) Humidity (%) 61</li> <li>Accident type LOCA/HELB</li> </ul> </li> <li>*(d) Radiation (rd) 1.2 x 10⁷ Accident type LOCA</li> </ul>	
	<ul> <li>(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):</li> <li>(a) Temperature (°F) <u>133.7</u> Accident type <u>LOCA/HELB</u></li> <li>(b) Pressure (psig) <u>ATM(-)</u> Accident type <u>NA</u></li> <li>(c) Humidity (%) <u>61</u> Accident type <u>LOCA/HELB</u></li> <li>*(d) Radiation (rd) <u>1.2 x 10</u> Accident type <u>LOCA</u></li> <li>(e) Spray Type <u>NA</u> Accident type <u>NA</u></li> </ul>	
	<ul> <li>(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):</li> <li>(a) Temperature (°F) 133.7 Accident type LOCA/HELB</li> <li>(b) Pressure (psig) ATM(-) Accident type NA</li> <li>(c) Humidity (%) 61 Accident type LOCA/HELB</li> <li>*(d) Radiation (rd) 1.2 x 10 Accident type LOCA</li> <li>(e) Spray Type NA Accident type NA</li> <li>* This dose includes a beta contribution of 6 x 10⁵ rads. See environmental drawing 47E235-44, Note 37.</li> </ul>	

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BINDER NO	. WBNEQ-IZS-003 PLANT WBN UNIT(S) 1 SHEET 22 OF 32 R_1 R_2
BINDER TI SWITCHES 10/1/81	TLE_EA740 LIMIT       COMPUTED_WCG       DATE       6/13/86 RHM       GOM/AL         MANUFACTURED AFTER       5/5/89       6/13/86 JDH       6/13/86 JDH       6/13/86 JDH
	5/5/89 6-15-94
K.3 <u>REQU</u>	IRED OPERATING ENVIRONMENT - IIR
KEIE	rence Environmental Drawing No. <u>47E235-45</u>
(1)	Normal Max (2) Abnormal Max
	(a) Temperature (°F) <u>75</u> (a) Temperature (°F) <u>120</u>
	(b) Pressure (psig) 0.3 (b) Pressure (psig) 0.3
	(c) Humidity (%) <u>60</u> (c) Humidity (%) <u>90</u>
·	(d) Radiation (rd) <u>3.5x10</u> (d) Radiation (rd) <u>NA</u>
(3)	Process Interfaces: <u>None</u>
(4)	State anticipated occurrence frequency and duration of abnormal conditions: <u>Abnormal conditions could exist up to eight hours</u>
	per excursion and will occur less than 1% of the plant life
	<u>(effect on qualified life is negligible - see generic position</u>
(-)	in Binder No. WBNEQ-GEN-001).
(5)	Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):
	(a) Temperature (°F) <u>327</u> Accident type <u>LOCA/HELB</u>
	(b) Pressure (psig) <u>11.2</u> Accident type <u>LOCA/HELB</u>
	(c) Humidity (%) <u>100</u> Accident type <u>LOCA/HELB</u> 7
	1 x 10 ₈ Gamma (d) Radiation (rd) <u>4.7x10 Bet</u> a Accident type <u>LOCA</u>
	(e) Spray Type <u>*</u> Accident type <u>LOCA/HELB</u>
*0.1 in 30 gpm	9 molar H ₃ BO ₃ (2,000 ppm Boron), 0.033 molar NaOH resulting a pH of 8.3 at 25°C. The duration of the containment spray is days, at a flow rate equal to 9,500 gallons per minute or 0.92 per square foot of containment cross section.

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0/1/81	CHECKED WBK DATE 8/19/86 JDH
	5/5/89
K. <u>REQU</u>	IRED OPERATING ENVIRONMENT (Continued)
	Comments (duration/peak/profile/spray composition and pH,
	margin, etc.): <u>For a cross-reference of equipment to</u>
	environmental drawing, See TAB G.
(6)	Is the equipment subject to moisture or liquid intrusion w
	can affect the performance of the equipment under design b
	See TAB G
(7)	Subject to submergence (Yes/No/NA)? <u>No</u> (Reference:
	See * note below
	Identify initiation time and duration of submergence:
·	See * note below.
(-)	The the sector which to a bate radiation contribution
(8)	the total accident dose (Yes/No/NA)? Yes
	(Reference: <u>TAB C, Section 9</u>
	If yes, identify the fraction of the unattenuated free field between to be added to the total dose and justify:
	beta dose to be added to the total doot and jubolity.
	See TAB C, Section 9
	Special environmental calculations (temp., rad., etc.)
(9)	The DIMS No
(9)	<u>type</u> <u>Rinb No.</u>
(9)	See TAB B, Section A
(9)	See TAB B, Section A
(9)	Impe     Mins No.       See TAB B, Section A
(9)	Itype         MIND_NO.           See TAB B, Section A
(9) * A	Imp No.       See TAB B, Section A
(9) * Al tl	<u>See TAB B, Section A</u> <u>See TAB B, Section A</u> <u>Il switches inside containment have been verified to be outs</u> he crane wall and, therefore, are not submerged by the trans lood level of 722' inside the crane wall.

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BINDE	SR NO. WENEQ-125-005 PLAN.		_ UNII(U)	$\frac{R_1}{6/27/86} RHM JD = \frac{1}{704}$
DINUE	THE MANIEACTIDED AFTER			5/5/89 10/15
<u>5WIIC</u>	ALL MANUFACIURED AFIER	CHECKED	WRY DATE	6/27/86 JDH CA
10/1/	/8L			5/5/89 710/1
L	SUMMARY COMPARISON OF TEST	CONDITIONS	TO SPECIFIED	CONDITIONS
	(1) Comparison of worst-ca	ase maximum	parameters:	
	Parameter	<u>Specified</u>	Demonstrated	Reference
			32 days***	TAB C,
	Operating Time	<u>100 days</u>	(test time)	Section 8
	Temperature (°F)	<u>327°F</u>	350	p. 10-92
	Pressure (psig)	11.2	76	p. 10-92
	Relative Humidity (%)	100	100	p. 10-57
			·	p. 4-7.
				p. 10-101
		See TAB C	See TAB C	pp. 10-91 thru
ŗ	Chemical Spray*	<u>Sect. 6</u>	Sect. 6	93
	6	x10 ⁷ gamma	8	
	5.1	2x10 ⁷ beta	$2.04 \times 10$	
	Radiation (rd)**	****	gamma	<u>p. 10-84</u>
				NA-See TAB B,
	Submergence	<u>NA</u>	<u>NA</u>	Page B-26
	*Includes spray concen	tration, fl	ow rate, dens	sity, duration, an
	pn.	tod normal	done plug int	egrated accident
	**Enter 40-year integra	ted normal	dose pius ind	egiated accident
	****See TAB C, Section 9.	• •		,
	(2) Comparison of worst-c	ase profile	s and margin	assessment:
		Test	Profile	
		Envelopes	Specified	
	Parameter	<u>(Yes</u>	/No/NA)	<u>Reference</u>
	Temperature	Yes		<u>See L(1)</u>
	Pressure	Yes	<u>,</u>	<u>See L(1)</u>
	Relative Humidity	Yes		See L(1)
	Chemical Spray	Yes		<u>See L(1)</u>
	onenicat obral			NA-See TAB B.
-	Submergence	<u>NA</u>	<u>.</u>	<u>Page B-26</u>
	Submergence JUSTIFICATION/COMMENT	<u>NA</u> S <u>*** For</u>	comparison of	Page B-26

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BINDER TI	TLE EA740 LIMIT COMPUTED WCG I	R_ DATE <u>6/19/8</u> 6	1 R
SWITCHES	MANUFACTURED AFTER CHECKED WBK 1	DATE <u>6/19/8</u> 6	5/5/89
L. <u>SUMM</u> (Con	ARY COMPARISON OF TEST CONDITIONS TO SPEC: tinued)	IFIED CONDIT	IONS
(3)	Were margins applied to the test parameter addressed in the test program to assure to and uncertainties are accounted for? (No Yes/No/NA).	ers or other that normal ote margin a	wise variation pplied,
	Suggested Margins per IEEE-323(74)	Margin <u>Applied</u>	<u>Yes/No/NA</u>
	Temperature: +15 degrees F	<u>+ 23°F</u>	Yes
	Pressure: +10% but no more than 10 psig	> 10%	<u>Yes</u>   Yes-See
	Radiation: +10% of accident dose	> 10%	TAB C, Section 9
	Time: +10% (or 1 hour + operating time per NUREG-0588)	10% See TAB C <u>Section 8</u>	Yes
· _	Voltage: ±10% of rated value	<u>NA</u>	<u>NA</u>
	Frequency: ±5% of rated value	<u>NA</u>	<u>NA</u>
	Environmental Transient: the initial transient and the peak temperature applied twice	2 Dwells	Yes
	Vibration: +10% added to acceleration	See <u>Comments</u>	Yes
	JUSTIFICATION/COMMENTS Per TVA Standard	Specificati	on SS-E18.
	<u> 12.01 - "Seismic Requirements for Categor</u>	<u>ry I Electri</u>	cal and
	I & C Equipment." These limit switches s	should be te	sted to
	3 g's Horizontal and 2 g's Vertical. Sin	<u>ace NAMCO ve</u>	rified in
	Appendix A of their report (p. 10-71) that	at cross cou	<u>pling was</u>
	not significant, the single axis test per	formed in e	ach of the
•	3 axis to 10 g's was more than adequate.		

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BINDER	NO	WBNEQ-IZS-003 PLANTWBN UNIT(S) SHEET SHEET
BINDER	TITLE	EA740 LIMIT SWITCHES COMPUTED WCM DATE 6/27/86 R R
MANU	FACTU	RED AFTER 10/1/81 CHECKED MEL DATE 6/1/86
M.	OPER/	BILITY TEST RESULTS
• (	(1)	Identify the safety function(s) of this equipment: (Reference <u>See Tab A</u> ).
		JUSTIFICATION/COMMENTS None
i	(2)	Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? <u>Yes</u> (Reference <u>p. 7-3</u> ).
		JUSTIFICATION/COMMENTS <u>A 2.5 millisecond contact opening during</u>
		seismic conditioning was considered a random occurance (see p. 5-11).
• (	(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? <u>Yes</u> (Reference <u>p.7-3</u> ).
		JUSTIFICATION/COMMENTS <u>None</u>
	(4)	Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? Yes (Reference Tab C, Section 8).
		JUSTIFICATION/COMMENTS The qualified life can be extended to
		40 years through refurbishment as defined in EQ749-20011.
		•

EQP090.54

BINDER NO. WBNEQ-IZS-003	PLANT WBN UNIT(S) 1 SHEET 27	_ 0 <del>1</del> ²
BINDER TITLEEA740 LIMIT	SWITCHES COMPUTED WCM DATE 6/27/86 R	R
MANUFACTURED AFTER 10/1/	(81 CHECKED WM DATE 6/1/86	<u></u>

#### M. OPERABILITY TEST RESULTS

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference Tab D, Sect. 10, p. 10-63 and Sect. 5, p. 5-11).

JUSTIFICATION/COMMENTS The 2.5 ms contact opening occured at 10 g's which is well above our 3 g test requirement. All other tests (Ref. 5-11, Sect. 5.10) showed no failures.

BIND BIND	ER NO. WBNEQ-IZS-003 PLANT WBN UNIT(S) 1 SHEET 28 ER TITLE EA740 LIMIT SWITCHES COMPUTED $\frac{40099}{290}$ DATE $\frac{945-96}{296}$ R R
N.	MAINTENANCE AND SURVEILLANCE
•	Has the qualification program identified those surveillance, maintenance and inspection parameters which are essential to maintain qualification which aid in detecting degrading materials or equipment performance (yes/no/NA)? Yes (Enter all requirements in Section G of the EQC Binder - Qualification Maintenance Data Sheets).
	JUSTIFICATION/COMMENTS See Tab G
	· · · · · · · · · · · · · · · · · · ·
	······································
	• · · · · · · · · · · · · · · · · · · ·

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BINDER T	TLE EA740 LIMIT SWITCHES COMPUTED were DATE	<u>4-15-86</u> R R
MANUFAC	TURED AFTER 10/1/81 CHECKED WILL DATE	<i>&amp;/19/8</i> 6
0. <u>Sum</u>	MARY OF REVIEW	<u>Yes/No/NA</u>
(1)	Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	Yes
(2)	Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	<u>NA</u>
(3)	Choice of qualification methodology adequately justified?	Yes
(4)	) If analysis was performed, complete the following:	
	(a) Were equipment performance requirements identified?	NA
	(b) Were specific features and failure modes and effects analyzed?	NA
	(c) Were assumptions and mathematical models used together with appropriate justification for their use?	NA
	(d) Were environmental parameters which affect equipment performance identified?	NA
(5)	Adequate similarity between equipment and test specimen established?	Yes
(6)	) Aging degradation evaluated adequately?	Yes
	(a) Mechanical and/or cycle aging addressed?	Yes
	(b) Equipment aged to end of life condition prior to application of DBE conditions?	Yes
	(c) Absence of preaging in test/analysis justified?	NA
·	(d) Materials susceptible to thermal/radiation aging identified?	Yes

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EQP090.54 TVA

BINDER NO	WBNEQ-IZS-003 PLANT WBN UNIT(S) 1 SHE	ET <u>30</u> 0F <u>32</u> 1 R
BINDER TITL	E <u>EA740 LIMIT</u> COMPUTED <u>WCG</u> DATE <u>6/13/8</u> 6 NUFACTURED AFTER	R71M 515/89
10/1/81	CHECKED WBK DATE 6/19/86	5/5/89
0. SUMMAR	Y OF REVIEW (Continued)	Yes /No /NA
		<u>IES/MO/MA</u>
(	e) Normally operating state of device (e.g., normally energized) considered?	TAB C R Sect. 10
(7) Q	ualified life or replacement schedule established?	Yes
(8) C s	riteria regarding temperature pressure exposure atisfied?	Yes
(	a) Peak temperature adequate	Yes
C	b) Peak pressure adequate	Yes
(	c) Duration adequate	Yes
(	d) Required profile enveloped adequately	Yes
. (*	e) Steam exposure adequate	Yes
(9) C	riteria regarding test sequence satisfied?	Yes
(10) C	riteria reqarding spray satisfied?	Yes
- (,	a) Was the spray testing done while under the extremes of pressure and temperature?	Yes
(1	b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed those to be used for the plant?	Yes-See TAB C Sect. 6
(11) C	riteria regarding submergence satisfied?	NA
(12) C	riteria regarding radiation satisfied?	Yes
(	a) Was dose rate considered?	Yes
(1	b) Was beta radiation considered?	Yes- See TAB C F Sect. 9
(13) C s	riteria regarding operability status/mode atisfied?	<u>Yes</u>
(14) C s	riteria regarding test failures or anomalies atisfied?	Yes

PAGE B-33 R1

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<u>10/1/81</u>	CHECKED_WBKDATE 6/19/8	36 JDH
		5/5/84
0. ST	MMARY OF REVIEW (Continued)	
		<u>Yes/No/NA</u>
(1	5) Criteria regarding functional testing satisfied?	Yes
	(a) Does the test plan/report specify an acceptance criteria for equipment performed?	Yes
	(b) Was an initial base line test done to establish required performance characteristics	3? <u>Yes</u>
	(c) Has the test analyis demonstrated that performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	yes
(1	.6) Criteria regarding instrument accuracy satisfied?	<u></u>
(1	7) Test duration margin (1 hour + function time) satisfied?	Yes-See TAB C ·
	(a) Is the minimum specified operating time at least 1 hour?	Yes
	(b) If exception to the 1-hour minimum operating time was taken, was adequate justification provided?	<u>NA</u>
(.1	8) Criteria regarding synergistic effects satisfied?	Yes
(1	9) Criteria regarding margins satisfied?	Yes
(2	0) Maintenance and surveillance requirements adequately identified?	Yes
P. <u>DI</u>	SCUSSION	
•	· · · · · · · · · · · · · · · · · · ·	

BINDER NO. WBNEQ-IZS-003 PLANT	<u>WBN</u> UNIT(S) <u>1</u> SHEET <u>32</u> OF
BINDER TITLE EA740 LIMIT	COMPUTED / RI BUM DATE 55-89
SWITCHES MANUFACTURED AFTER	CHECKED / RI JDH DATE 5-5-89

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BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 1 OF1 2 BINDER TITLE <u>EA740 Limit Switches</u> COMPUTED <u>wc32</u> DATE <u>5/22/36</u> <u>R</u> _____ Manufactured between February 20, 1978 CHECKED Map DATE 6/27/10 and October 1, 1981 TAB A - Identification of equipment comprising the equipment type PAGEA-1

BINDER	NO. <u>WBNEQ-125-004</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>1a</u> OF_
RIMDED	TITIE NAMCO RAZAO LINTE CONDUMED (DI CAC DAME AND SEC.
SWITCH	ES MANUFACTURED BETWEEN COMPUTED /RICAG DATE 2-22-84 WC7
FEB. 2	0, 1978 AND OCT. 1, 1981 CHECKED /RIJDH DATE 2-22-89
	TAB A
	NOTES
1.	Elevations shown are <u>Actual</u> elevations for equipment located in the Reactor Building and <u>Floor</u> elevations for equipment located outside the Reactor Building. Actual elevations for all equip- ment are documented in TAB F.
2.	See Page B-2A for source of Category and Operating Time assign- ments.
3.	For 1-ZS-30-0056-A Model No. Discrepancy, See TAB C, Page C-135.
4.	The safety function of this limit switch is as follows:
	To open preventing solenoid reenergization and valve opening,
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
· · · · · · · · · · · · · · · · · · ·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
· ·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
· ·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
· · ·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
· ·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.
· · ·	To open preventing solenoid reenergization and valve opening, it must remain open to prevent valve position changes after containment vent isolation reset. It must also provide position indication for PAM.

PAGE A-1A R2

» WBEP-0095Q



PRINT DATE: 06/05/90

#### BINDER NO. : HBNEQ-IZS -004 Manufacturer : Namco Page 1 of 7

# HATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVICE ID NO. Description Model Numb	AZMITH ELEV(1) RM/RAD ER CONTRACT	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-ZS -030-0008A -B 1-ZS -030-0008/1 -B Upper compt purge ISLN VALVE POS SW EA74050001	289 797 2" UC 79K3-824495-1	A A A A A	100D 100D 100D 1MO 1MO	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -030-0008B -B 1-ZS -030-0008/2 -B Upper Compt Purge ISLN valve pos SM EA74050000	289 797º 2₩ UC 79K3-824495-1	A A A A A	100D 100D 100D 100D 1M0 1M0	L Ms/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -030-0010A -A 1-ZS -030-0010/1 -A Upper compt purge ISLN valve pos SW EA74050000	270 790' UC 79K3-824495-1	A A A A	100D 100D 100D 1MO 1MO	L MS/C FW/C RH/C CV/C	SEE NOTE 4.
WBN-1-ZS -030-0010B -A 1-ZS -030-0010/2 -A Upper compt purge ISLN Valve POS SW EA74050000	270 790' UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L Ms/C FW/C RH/C CV/C	SEE NOTE 4.
WBN-1-ZS -030-0015A -B 1-ZS -030-0015/1 -B Lower Compt Purge ISLN VALVE POS SW EA74050000	299 737 <b>% 1#</b> AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 4.



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PREPARER/DATE_	WCG	9/10/86	CAG	was	
CHECKED/DATE	NAP	9/10/86	JDH	CAL	
	•	•	2-23-89	6/8/90	





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BINDER NO. : WBNEQ-IZS -004 Manufacturer : Namco Page 2 of 7

### WATTS BAR NUCLEAR PLAN'T TABA - EQUIPMENT IDENTIFICATION MATRIX

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EQIS NUMBER UNIT DEVICE ID NO. AZMIT DESCRIPTION MODEL NUMBER	LOCATION H <u>ELEV(1)</u> RM∕RAD CONTRACT		<u>OPER_TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-ZS -030-0015B -B 1-ZS -030-0015/2 -B 299 Lower Compt Purge Isln valve pos SM EA74050000	736" 7" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L Ms/C FW/C RH/C CV/C	SEE NOTE 4.
WBN-1-ZS -030-0017A -A 1-FCV -030-0017/ZS1 -A 239 Lower compt purge ISLN valve limit SW EA74050000	738' 1" AC3 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 4.
WBN-1-ZS -030-0017B -A 1-FCV -030-0017/ZS2 -A 239 Lower Compt Purge ISLN valve limit SW EA74050000	737' 6" AC3 79K3-824495-1	A A A A A	100Ð 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	SEE NOTE 4.
WBN-1-ZS -030-0020A -A 1-ZS -030-0020/1 -A 059 IIR Purge ISLN valve pos switch EA74050000	727 <b>* 8#</b> IIR 79K3-824495-1	A A A A A	100D 100D 100D 1MO 1MO	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -030-0020B -A 1-ZS -030-0020/2 -A 059 IIR PURGE ISLN VALVE POS SWITCH EA74050000	727' 2" IIR 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN PREVENTING SOL REENERGIZATION AND VALVE OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
	PREPARER/DATE CHECKED/DATE_	N.	<u>сс 9</u> Ар 9	/10/8 /10/8	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$


# BINDER NO. : WBNEQ-IZS -004 Manufacturer : Namco Page 3 of 7

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#### PRINT DATE: 06/05/90

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## WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVICE ID NO. AZMITH DESCRIPTION MODEL NUMBER	LOCATION - <u>Elev(1)</u> RM/RAD Contract	<u>CAI</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-ZS -030-0040A -A 1-FCV -030-0040/ZS1 -A 284 Lower compt purge cont valve pos SM EA74050000	721'11" AC4 79K3-824495-1	A A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN Preventing sol reenergization and vlv opening upon cntmnt vent isol reset. Provide Pos Indication for Pam.
WBN-1-ZS -030-0040B -A 1-FCV -030-0040/ZS2 -A 290 Lower compt purge cont valve pos SH EA74050000	721' 8" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -030-0050A -B 1-ZS -030-0050/1 -B 295 Upper CNTMT EXH ISLN VALVE POS SM EA74050000	746' 4" AC4 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET.PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -030-0050B -B 1-ZS -030-0050/2 -B 295 Upper CNTMT EXH ISLN VALVE POS SM EA74050000	746' 4" AC4 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FH/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -030-0052A -A 1-ZS -030-0052/1 -A 247 UPPER CNTMT EXH ISLN VALVE POS SW EA74050000	754' 3" UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
AGE	· · ·				<u>R_1</u>
<ul> <li>▶</li> <li>Ⅰ</li> </ul>	PREPARER/DATE CHECKED/DATE_	W N	<u>CG</u> AP	9/10/ 9/10/	86 CAG 2000 2-13-59 6-8-90 86 JDH CAN 2-23-89 68/90



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BINDER NO. : WBNEQ-IZS -004 Manufacturer : NAMCO Page 4 of 7

PRINT DATE: 06/05/90

#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER UNIT DEVICE ID NO. AZMITH. DESCRIPTION MODEL NUMBER	-LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-ZS -030-00525 -A 1-ZS -030-0052/2 -A 247 Upper CNTMT EXH ISLN VALVE POS SW EA74050000	754' 3" UC 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN Preventing Sol Reenergization and VLV opening Upon Cntmnt Vent ISOL Reset. Provide Pos Indication For Pam.
HBN-1-ZS -030-0056A -A 1-ZS -030-0056/1 -A 034 Loher CNTMT EXH ISLN VALVE POS SH EA74050000	737' 9" AC1 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN Preventing sol reenergization and VLV opening upon cntmnt Vent ISOL reset. Provide Pos Indication for PAM.
WBN-1-ZS -030-0056B -A 1-ZS -030-0056/2 -A 034 Lower Cntmt EXH ISLN VALVE POS SM EA74050000 (3)	737' 9" AC1 79Ķ3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON CNTMNT VENT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0305A -B 1-FCV -031-0305/ZS1 -B 062 IIR CHILLER A CWR ISLN VALVE LIMIT SW EA74020100	736' 3ª ANN 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
NBN-1-ZS -031-0305B -B 1-FCV -031-0305/ZS2 -B 060 IIR CHILLER A CHR ISLN VALVE LIMIT SH EA74020100	736' ANN 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VALVE OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
<b>BE</b> A - 5	PREPARER/DATE CHECKED/DATE_	W N	<u>сс</u> Ар	9 /10 9 /10	R_1 R_2 R 186 CAG AUCD 2-23-89 C-8-99 186 DDH CAA 2-23-89 6/8/90



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#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX . .:

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EQIS NUMBER UNIT DEVICE ID NO. AZMITH DESCRIPTION MODEL NUMBER	-LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-ZS -031-0306A -A 1-FCV -031-0306/ZS1 -A 061 IIR Chiller A CWR ISLN VALVE LIMIT SM EA74020100	737'11" IIR 79K3-824495-1	A A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0306B -A 1-FCV -031-0306/ZS2 -A 061 IIR CHILLER A CWR ISLN VALVE LIMIT SH EA74020100	737' 5" IIR 79K3-824495-1	A A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0308A -A 1-FCV -031-0308/ZS1 -A 061 IIR CHILLER A CWS ISLN VALVE LIMIT SW EA74020100	739' 2" IIR 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0308B -A 1-FCV -031-0308/ZS2 -A 061 IIR CHILLER A CWS ISLN VALVE LIMIT SW EA74020100	739" 2" IIR 79K3-824495-1	A A A .A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0309A -B 1-FCV -031-0309/ZS1 -B 062 IIR CHILLER A CWS ISLN VALVE LIMIT SW EA74020100	738' 4" ANN 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
	PREPARER/DATE CHECKED/DATE	<u>- W(</u> NA	<u>26</u> 9 1799	10 8  10 8	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$



BINDER NO. : WBNEQ-IZS -004 Manufacturer : Namco Page 6 of 7

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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS N DESCRI	IUMBER PTION	<u>UNIT DEVICE ID</u>	NO. AZMITH_ MODEL_NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAI</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1- IIR Ch	ZS -031-0309B - Iiller A CHS ISLN V	B 1-FCV,-031-0309 Alve Limit SW	/ZS2 -B 062 EA74020100	738   1= ANN 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN Preventing sol reenergization and vlv opening upon phase a cntmnt isol reset. Provide Pos indication for Pam.
WBN-1- IIR CH	-ZS -031-0326A - Hiller B CNR ISLN V	A 1-FCV -031-0326 Valve Limit SH	∕ZS1 -A 105 EA74020100	733' 9" ANN 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1- IIR Ch	-ZS -031-0327A - Hiller B CWR ISLN V	B 1-FCV -031-0327 Valve limit SW	/ZS1 -B 103 EA74020100	734° 1" IIR 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1- IIR CH	-ZS -031-0327B - Hiller B CWR ISLN V	B 1-FCV -031-0327 Valve Limit SW	/ZS2 -B 103 EA74020100	733' 3" IIR 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1- IIR CH	-ZS -031-0329A - Hiller B CWR Isln V	B 1-FCV -031-0329 Alve limit SW	/ZS1 -B 103 EA74020100	733' 5" IIR 79K3-824495-1	A A A A	100D 100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
AGE A -			· · ·	PREPARER/DATE	<u></u>	<u>ca</u>	7/10/	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
7				CHECKED/DATE_	<u>. N</u>	<u>nr </u>	((10/	2-23-89 48/90



BINDER NO. : WBNEQ-IZS -004 Manufacturer : Namco Page 7 of 7

PRINT DATE: 06/05/90

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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

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EQIS NUMBER UNIT DEVICE ID NO. AZMITH. DESCRIPTION MODEL NUMBER	LOCATION ELEV(1) RM/RAD Contract	<u>CAI</u> (2)	OPER TIME	EVENI	SAFETY FUNCTION
WBN-1-ZS -031-0329B -B 1-FCV -031-0329/ZS2 -B 103 IIR CHILLER B CWR ISLN VALVE LIMIT SW EA74020100	732' 5" IIR 79K3-824495-1	A A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0330A -A 1-FCV -031-0330/ZS1 -A 109 IIR Chiller B CWS ISLN VALVE LIMIT SM EA74020100	734" 5" ANN 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.
WBN-1-ZS -031-0330B -A 1-FCV -031-0330/ZS2 -A 110 IIR CHILLER B CWR ISLN VALVE LIMIT SW EA74020100	733' 9" ANN 79K3-824495-1	A A A A	100D 100D 100D 1M0 1M0	L MS/C FW/C RH/C CV/C	TO OPEN AND REMAIN OPEN PREVENTING SOL REENERGIZATION AND VLV OPENING UPON PHASE A CNTMNT ISOL RESET. PROVIDE POS INDICATION FOR PAM.

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PREPARER/DATE_	WCG	9/10/86	CAG	1200	
CHECKED/DATE	NAP	9/10/86	JDH 2-23-84	6/8/90	

BINDER NO.	WBNEQ-IZS-004 PLA	ANT WBN	UNIT(S)	S	HEET <u>1</u> OF ¹
BINDER TITLE	EA740 Limit Swi	tches COMP	UTED wer	_DATE <u>5-22-8</u>	<u> </u>
Manufactured	between February	20, 1978 CHEC	KED <u>Map</u>	_DATE 6/27/8	<u> </u>
and October	1, 1981				
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		· · ·			
	TAB B - Checklis	st for evaluati	on of environ	nmental qualf	ication
		LICE COLLING S COMMA	ity and concer		
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BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 1 OF R 1 R 3	28
BINDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86 CAG JDA SWITCHES MANUFACTURED BETWEEN 2/22/89 %/ FEB. 20, 1978 AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 JDH C/ 2/22/89 //	H 15/90 XH 9/16/90
A. <u>DOCUMENTATION</u> (See Note)	i
Equipment Description Limit Switch	
Vendor/Manufacturer <u>NAMCO</u>	
Equipment Model No.(s) <u>EA740-20100</u>	-
<u>EA740-50000</u>	
EA740-50001	
QUALIFICATION REPORTS (See Note)	
*(1) Title/Number/Revision <u>Qualification of</u> RIMS <u>B70 851017 104</u> NAMCO Controls Limit Switch Model EA-740 to IEEE Standards 344 ('75), 323 ('74), and <u>382 ('72)</u> DATE <u>2/20/78</u>	
(2) Title/Number/Revision <u>Test Plan 8/31/77</u> RIMS <u>B70 851031 007</u> Qualification of Series EA-180 and EA-740 Switches for Class IE use in Nuclear Power Plants in Compliance with IEEE Standard <u>382-1972</u> DATE <u>8/31/77</u>	-
(3) Title/Number/Revision <u>Supplement 02 to QTR RIMS_B70_870121_003</u> 111 - Qualification by Similarity Presentation to Support the Change of <u>Contact Block/Carrier Material</u> DATE_12/16/86	-
(4) NAMCO Report No. QTR 140, Dated 4/19/84. (Selected Parts) (C-82 thru C-92)	
<pre>(5) NAMCO Report No. QTR 155, Dated 10/5/87. (Selected Parts)    (D-161 thru D-165)</pre>	
(6) NAMCO Report No. QTR 107, Dated 4/6/82. (Selected Parts) (C-81A thru C-81D)	R3
<pre>(7) NAMCO Report No. QTR 111, Dated 10/1/81. (Selected Parts) (C-75 thru C-78)</pre>	
OTHER (ANALYSIS, VENDOR DATA, ETC.)	-
(8) TVA Environmental Drawing 47E235-41 R1, DCA P-04104-01-0, and S-09715-10,-11,-12	-
(9) TVA Environmental Drawing 47E235-42 R2, DCA P-04104-02-0,	_ R3
-03-0, -02-1, -05-0,  and  S-09715-02, -03, -04, -05, -13, -14, -15	1

PAGE B-2 R3

<ul> <li>A. <u>DOCUMENTATION</u></li> <li>OTHER (ANALYSIS, VENDOR DATA, ETC.) (Continued)</li> <li>(11) TVA Environmental Drawing 47E235-45 Rl, DCA P-04104-06-0, ar <u>S-09715-06,-07,-08,-09,-19</u></li> <li>(12) WENTSR-051 R0 (B26 891129 202), Reduction of Beta Dose by Sheet Steel</li> <li>(13) WENOSG4-008 R16 (B26 900717 201) System 30 Category and Operating Times Calculation</li> <li>(14) WENOSG4-009 R7 (B26 900309 233) System 31 Category and Operating Times Calculation</li> <li>(15) WEN-EEB-MS-TI06-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to thireport.</li> <li>Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	INDER TITL WITCHES MA EB. 20, 19	E NAMCO EA740 LIMIT COMPUTED /R1 CAG NUFACTURED BETWEEN . 78 AND OCT. 1, 1981 CHECKED /R1 JDH	R_2R <u>DATE 2/22/89 WCG</u> 6/6/90 <u>DATE 2/22/89 CDH</u> 6/8/90
<ul> <li>OTHER (AMALYSIS, VENDOR DATA, ETC.) (Continued)</li> <li>(11) TVA Environmental Drawing 47E235-45 Rl, DCA P-04104-06-0, ar <u>S-09715-06,-07,-08,-09,-19</u></li> <li>(12) WENTSR-051 RO (B26 891129 202), Reduction of Beta Dose by Sheet Steel</li> <li>(13) WENOSC4-008 R16 (B26 900717 201) System 30 Category and Operating Times Calculation</li> <li>(14) WENOSC4-009 R7 (B26 900309 233) System 31 Category and Operating Times Calculation</li> <li>(15) WEN-EEB-MS-TI06-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to thir report.</li> <li>Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	A. DOCUMEN	TATION	
<ul> <li>(11) TVA Environmental Drawing 47E235-45 R1, DCA P-04104-06-0, ar S-09715-06,-07,-08,-09,-19</li> <li>(12) WENTSR-051 R0 (B26 891129 202), Reduction of Beta Dose by Sheet Steel</li> <li>(13) WENOSG4-008 R16 (B26 900717 201) System 30 Category and Operating Times Calculation</li> <li>(14) WENOSG4-009 R7 (B26 900309 233) System 31 Category and Operating Times Calculation</li> <li>(15) WEN-EEB-MS-TI06-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to thi report.</li> <li>Note: Documents listed above are used throughout this binder fo equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	OTHER	(ANALYSIS, VENDOR DATA, ETC.) (Continue	ed)
<ul> <li>(12) WBNTSR-051 R0 (B26 891129 202), Reduction of Beta Dose by Sheet Steel</li> <li>(13) WBNOSG4-008 R16 (B26 900717 201) System 30 Category and Operating Times Calculation</li> <li>(14) WBNOSG4-009 R7 (B26 900309 233) System 31 Category and Operating Times Calculation</li> <li>(15) WBN-EEB-MS-TI06-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to the report.</li> <li>Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	(11) TV# <u>S-(</u>	Environmental Drawing 47E235-45 R1, D( )9715-06,-07,-08,-09,-19	CA P-04104-06-0, and
<ul> <li>(13) WENOSG4-008 R16 (B26 900717 201) System 30 Category and Operating Times Calculation</li> <li>(14) WENOSG4-009 R7 (B26 900309 233) System 31 Category and Operating Times Calculation</li> <li>(15) WEN-EEE-MS-TI06-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to thir report.</li> <li>Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	(12) WBI She	TSR-051 RO (B26 891129 202), Reduction et Steel	of Beta Dose by
<ul> <li>(14) WBNOSG4-009 R7 (B26 900309 233) System 31 Category and Operating Times Calculation</li> <li>(15) WBN-EEB-MS-TIO6-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to thireport.</li> <li>Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	(13) WBI Ope	NOSG4-008 R16 (B26 900717 201) System 30 erating Times Calculation	) Category and
<ul> <li>(15) WBN-EEB-MS-TI06-0017 (B26 900202 410) 120V AC Vital Instrument Power Voltage Profile</li> <li>*Unless specified otherwise, all references made herein are to thireport.</li> <li>Note: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the bind This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.</li> </ul>	(14) WBI Ope	NOSG4-009 R7 (B26 900309 233) System 31 erating Times Calculation	Category and
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	Note:	Documents listed above are used throug equipment qualification. The revision Information Management System (RIMS) n above, need not be repeated in other s This listing includes only those docum essential to qualification and accordin considered a complete listing of binde	hout this binder for levels and Records & umbers, as listed ections of the binder ents which are ngly should not be r references.
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WBEP-0095Q

SWI	TCHES MANUFACTURED BETWEEN 2/22/899/
FEB	. 20, 1978 AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 JDH 2/22/89
В.	<u>CONCLUSION_OF_REVIEW</u> (Check only one block)
	X Equipment Qualified
	Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule
	Equipment Qualification Not Established by Documentation
	Equipment Not Qualified Based on Test Failures
	OPEN ITEMS AND QUALIFICATION DEFICIENCIES
	1. Unqualified lever arms
	2. Unqualified gaskets
	COMMENTS/RECOMMENDATIONS The required operating environments.
	COMMENTS/RECOMMENDATIONS <u>The required operating environments</u> , <u>normal and accident</u> , <u>have been reviewed for each switch location</u> <u>identified in TAB A. All switches are qualified to the worst case</u>
	COMMENTS/RECOMMENDATIONS <u>The required operating environments</u> , <u>normal and accident</u> , <u>have been reviewed for each switch location</u> <u>identified in TAB A. All switches are qualified to the worst case</u> <u>combination of these environmental parameters</u> . <u>This includes</u>
	COMMENTS/RECOMMENDATIONS <u>The required operating environments</u> , <u>normal and accident</u> , <u>have been reviewed for each switch location</u> <u>identified in TAB A. All switches are qualified to the worst case</u> <u>combination of these environmental parameters</u> . <u>This includes</u> <u>consideration of peak levels and profiles</u> .
	COMMENTS/RECOMMENDATIONS The required operating environments, normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.
	COMMENTS/RECOMMENDATIONS The required operating environments, normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.
	COMMENTS/RECOMMENDATIONS <u>The required operating environments</u> , normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.
	COMMENTS/RECOMMENDATIONS The required operating environments, normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.
	COMMENTS/RECOMMENDATIONS The required operating environments, normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.
· .	COMMENTS/RECOMMENDATIONS The required operating environments, normal and accident, have been reviewed for each switch location identified in TAB A. All switches are qualified to the worst case combination of these environmental parameters. This includes consideration of peak levels and profiles.

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WBEP-0095Q

2MT	TCHES MANUFACTURED BETWEEN	
FEB	RUARY 20, 1978 AND OCTOBER 1, 198 CHECKED $\underline{hup}$ DATE $\underline{bp?/86}$	
с.	QUALIFICATION CRITERIA	
*	Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate Which Criteria is Applicable):	
	Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE323-1974)	
	X Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of lE Bulletin No. 79- 01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)	·
	JUSTIFICATION/COMMENTS The date codes on the limit switches (TAB F)	
	indicate that all switches were manufactured in the year of 1979.	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	·
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET IEEE Standard 323-1971	

· ·	·	
	BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SH BINDER TITLE NAMCO EA740 LIMIT COMPUTED 4009 DATE 6/25/84 FEBRUARY 20, 1978 AND OCTOBER 1, 1981 FEBRUARY 20, 1978 AND OCTOBER 1, 1981 CHECKED MAP DATE 6/27/86	IEET <u>4</u> OF <u>28</u>
	D. QUALIFICATION METHODOLOGY	dan Similan
	Conditions with Supporting Analysis	Get Stmitat
	<u>X</u> Test of Similar Items with Supporting Analysis Analysis in Combination with Partial Type Test Data tha Supports the Analytical Assumptions and Conclusions	it .
	Experience with Identical or Similar Equipment Under Si Conditions with Supporting Analysis	milar
	JUSTIFICATION/COMMENTS This test provides generic group qualif	ica
	tion for EA-740 series limit switches. Model EA-740-20000 was	
	selected for test purposes and is identical to models of the sa	me
	number at Watts Bar. Other models of the EA-740 series have be	en
	qualified with supporting supplementary testing and similarity	
	discussions. See TAB C, Section 3 for similarity evaluation.	
		<u></u>
$\Box$		
	DACE R-S	
		<del></del> ፑ <u>ጉ</u> ₽ተ <del>የ</del> ዓ- <u>ፊ</u> ዓ

		• <u>WDNEQ-125-00</u> 4 ILAN		0N11(3) <u>1</u>	R_1_R
BIND	ER TI CHES	TLE <u>NAMCO EA740 LIMI</u> MANUFUACTURED BETWEE	T COMPUTED N	WCG DATE <u>6/25</u>	186 1.209
FEB.	_20,	1978 AND OCT. 1. 198	1 CHECKED	NAP. DATE 6/27	186 JDH
					2-22-09
E.	EQUI	PMENT DESCRIPTION			
. [.]	Is t iden (Yes	he equipment identif tical to the plant e /No/NA)? <u>Yes</u>	ied in the qua quipment which	lification docume requires qualif:	entation ication
			<u>Plant Device</u>	Qualification	Reference TAB D-1.
	(1)	Equipment Type	Limit Switch	Limit Switch	Page D-5
	(2)	Manufacturer	NAMCO	NAMCO	Page D-5
	(3)	Model Number(s)	<u>EA-74020100</u>	EA-74020000	Page $D-5$
			<u>EA-74050000</u>		
			<u>EA-74050001</u>		
		•			
	(4)	Serial Number(s)	See comments	See comments	<u>See_comme</u> nts
	<b>/</b> - <b>\</b>				
	(5)	Identify Component- Unique checksheet	NA	· · · · · · · · · · · · · · · · · · ·	·
		attached:	NA		
	JUST	IFICATION/COMMENTS	NAMCO Limit Su	witches do not be	ave serial
		are hut data and a	tonnod on the		
		ELS DUL GALE COGES S	camped on the (	Conquit entrance	or cué
	<u>swit</u>	cn. These are docum	ented in TAB F	(Date Code Syste	em
	<u>desc</u>	ribed in TAB E, Sect	ion 1). Field	Verification (TA	ABF) has
	<u>conf</u>	irmed that all limit	switches cover	red in TAB A have	e a date
	<u>code</u>	of Feb, 1979. Simi	larity of the o	lifferent model n	numbers is
	disc	ussed in TAB C. Sect	ion 3. Contrac	ct Certification	of
	<u>Comp</u>	liance for these swi	tches found in	TAB E. Section	L:

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MDER NO. WDNEQ-120			R_1R
NDER TITLE NAMCO E	A740 LIMIT COMPUTED	) <u>WCG</u> DATE <u>6/2</u>	5/86 0-121
TTCHES MANUFUACTUR	ED BETWEEN T 1 1991 CHECKED	NAP DATE 6/2	7/86 +04
		<u> </u>	2-22-89
	•••		···
. INSTALLATION IN	<u>TERFACES</u>		-
List all interf documentation a interface a req If yes, enter r	aces pertinent to EQ i nd/or evaluation and r uirement for our appli equirement in QMDS, if	dentified in the reference the sou cation (Yes/No)? no, provide jus	qualificatio rce. Is the (Note below tification.
		Plant	•
		Requirement?	Reference
<u>Interface</u>	Identify Interface	(Yes/No)	<u>Test Report</u>
Mounting Bolts	<u>NA</u>	NA	NA
External			
Process	NA	NA	<u>NA</u>
Connections			
Electrical	NA	NA	NA_
Connections			
Conduit Seals	Required	Yes	TAB D, $D = 10$
		• .	<u></u>
Connector	37.4		
Seals	<u>NA</u>	<u>NA</u>	NA
Orientation	None	NA	NA
Physical			
Configuration	None	NA	NA
-	See comments		· ·
Other	(1) and (2)	<u>NA</u>	NA
JUSTIFICATION/C	OMMENTS <u>(1) For insta</u>	llation instruct	<u>ions refer to</u>
EA749 90002 (TA	B.H. Section 1). Moun	ting and connect	ion require-
ments are also a	addressed in TAB D - T	EST PLAN page 1,	Section (2).

conditions. All switches inside containment must have a qualified

such a way as to maintain switch integrity under required service

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Conax seal (Ref. to generic binder WBNEO-CSC-001).

## PAGE B-7 R1



BINDER NO	. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 7 OF 28
BINDER TI SWITCHES FEB. 20,	TLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86 144 MANUFUACTURED BETWEEN 2.22.84 1978 AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 JDH
	2-22-89
G. <u>TEST</u>	SEQUENCE
(1)	Test Sequence: Was the test sequence established to simulate the accident environment in accordance with IEEE-323 (74), paragraph 6.3.2 (Yes/No/NA)? (Note below.)
	Yes/No/NAReference
,	(a) Equipment inspected for damage Yes TAB D-1, p D-6
	(b) Baseline performance measurements taken <u>Yes</u> <u>TAB D-1, p D-</u> 6
	(c) Equipment aged: Thermal <u>Yes</u> <u>TAB D-1, p D-</u> 6
	Radiation Yes TAB D-1, p D-7 R1
	Wear <u>Yes</u> <u>TAB D-1, p D-</u> 6
	(d) Vibration/seismic testing conducted <u>Yes</u> <u>TAB D-1, p D-</u> 7
•	(e) Design basis event (DBE) exposure <u>Yes</u> <u>TAB D-1,p D-1</u> 0
	(f) Post-DBE exposure <u>Yes</u> <u>TAB D-1,p D-1</u> 1
	(g) Final inspection and disassembly <u>Yes</u> <u>TAB D-1.p D-38</u>
(2)	Was the same piece of equipment used throughout the test sequence described in item (1) above (Yes/No/NA)? Yes See Comment (2).
(3)	Have the test equipment, test equipment accuracies and calibration data been appropriately document (Yes/No/NA)? <u>No</u> See Comment (1) (Reference <u>TAB D-1, Appendix E, page 1</u> ).  R1
JUS	TIFICATION/COMMENTS (1) Test equipment and calibration dates
Wer	e recorded: however, test equipment accuracies were not
<u>doc</u>	umented in the test report. (2) The test switch was not used
in	the seismic qualification. however, it was seismically condi-
tion	ned by subjecting it to all vibrations contained in the seismic
tes	ts (Ref. TAB D-1, pages D-8 and D-10)  R1

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תזגד פ	ER NU	$\frac{WBNEQ-125-00}{TTE} WBN = COMPUTED WCC$	.1(3) <u> </u>	$\begin{array}{c} \text{R} \\ \text{R} \\ \text{R} \\ 1 \\ 1 \\ \text{R} \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $
SWIT	CHES	MANUFUACTURED BETWEEN	DAIE <u>6/</u>	2-72-34
FEB.	_20,	<u>1978 AND OCT. 1, 1981</u> CHECKED <u>NAP</u>	DATE <u>6/</u>	27/86 J04 2-22-89
н.	AGIN	<u>G</u>		· · ·
	(1)	Was aging considered in the qualifica	tion progra	am
		(Yes/No/NA)? <u>Yes</u> (Reference: <u>TA</u>	B D-1 page:	s D-6 and D-
		<u></u>	<u></u>	
		JUSTIFICATION/COMMENTS None		
	(2)	Were the following effects considered	in the ag	ing program:
·		Aging Effect	Yes/No/NA	Reference_
		Thermal action	Vac	Pages D-6 a
		inermal aging	1es	D-34 TAB D-1
		Radiation exposure	<u>    Yes</u>	Pages D-7 a D-36
		Vibration (non-seismic) aging	Yes	TAB D-1. Page D-32
		Operational (electrical/mechanical/ process) stress aging	Yes	TAB D-1 Pages D-6 a D <u>-35</u>
		JUSTIFICATION/COMMENTS None		
			<u></u>	•
	(3)	Were all known synergistic effects wh significant effect on equipment perfo aging program (Yes/No/NA)? <u>Yes</u>	ich are bei rmance con (Reference	lieved to ha sidered in t e:
		See TAB C, Section 16		
		See TAB C. Section 16 JUSTIFICATION/COMMENTS None		
		<u>See TAB C. Section 16</u> JUSTIFICATION/COMMENTS <u>None</u>		
	(4)	See TAB C, Section 16 JUSTIFICATION/COMMENTS None Thermal Aging:		
	(4)	<u>See TAB C. Section 16</u> JUSTIFICATION/COMMENTS <u>None</u> Thermal Aging: (a) Was thermal aging considered in (Yes/No/NA)? <u>Yes</u> (Reference:	the qualif: <u>TAB D-1,</u>	ication prog page D-6
	(4)	See TAB C. Section 16 JUSTIFICATION/COMMENTS None Thermal Aging: (a) Was thermal aging considered in (Yes/No/NA)? Yes (Reference: JUSTIFICATION/COMMENTS None	the qualif: <u>TAB D-1,</u>	ication prog page D-6

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SWITCHES MANU	<u>NAMCO EA740 LIMIT</u> COMPUTED WCG DATE <u>6/26/86</u>
FEB. 20, 1978	AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 JOH 2-22-89
H. <u>Aging</u> (Co	ontinued) -
(b)	Were the materials susceptible to thermal aging degradati identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB E, Section 2</u> )
	JUSTIFICATION/COMMENTS See also Materials Analysis in
	TAB C, Section 6.
(c)	Was the basis for thermal aging identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1, Page D-6, footnote "+"</u> )
	JUSTIFICATION/COMMENTS See Materials Analysis in TAB C.
	Section 6.
(b)	Was the aging acceleration rate justified and the paramet of time and temperature identified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1, page</u> <u>D-6, footnote "+"</u> )
	<u>Parameter Plant Maximum Normal Test Equivalent</u>
• •	Temperature         75°F/110°F/120°F         NA         75°F/110°F/120           Time         40 yrs         NA         40/14.2/8.6 yr
	JUSTIFICATION/COMMENTS <u>Qualified life established by</u>
	JUSTIFICATION/COMMENTS <u>Qualified life established by</u> <u>Materials Analysis in TAB C. Section 6.</u>
(e)	JUSTIFICATION/COMMENTS <u>Qualified life established by</u> <u>Materials Analysis in TAB C. Section 6.</u> Was the Arrhenius methodolgy used for accelerated aging (Yes/No/NA)? <u>Yes</u> (Reference: <u>NA</u> )
(e)	JUSTIFICATION/COMMENTS <u>Qualified life established by</u> <u>Materials Analysis in TAB C. Section 6.</u> Was the Arrhenius methodolgy used for accelerated aging (Yes/No/NA)? <u>Yes</u> (Reference: <u>NA</u> ) JUSTIFICATION/COMMENTS <u>See Materials Analysis in TAB C.</u>
(e)	JUSTIFICATION/COMMENTS Qualified life established by <u>Materials Analysis in TAB C. Section 6.</u> Was the Arrhenius methodolgy used for accelerated aging (Yes/No/NA)? <u>Yes</u> (Reference: <u>NA</u> ) JUSTIFICATION/COMMENTS <u>See Materials Analysis in TAB C.</u> <u>Section 6.</u>
(e) (f)	JUSTIFICATION/COMMENTS       Qualified life established by         Materials       Analysis in TAB C. Section 6.         Was the Arrhenius methodolgy used for accelerated aging         (Yes/No/NA)?       Yes         (Reference:       NA         JUSTIFICATION/COMMENTS       See Materials Analysis in TAB C.         Section 6.
(e) (f)	JUSTIFICATION/COMMENTS       Qualified life established by         Materials       Analysis in TAB C. Section 6.         Was the Arrhenius methodolgy used for accelerated aging       (Yes/No/NA)? Yes (Reference: NA))         JUSTIFICATION/COMMENTS       See Materials Analysis in TAB C.         Section 6.

BINDER TITLE	NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86 Coder
SWITCHES MAN	$\frac{1}{2} \frac{1}{2} \frac{1}$
FEB. 20, 197	AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 TOL
· · · · · ·	. 2-12-89
••	
H. <u>Aging</u> (C	ontinued)
(g)	If a regression line was used for determining accelerat
	aging parameters, are test points or failure modes
.,	(Reference: NA
	JUSTIFICATION/COMMENTS <u>Regression line not used.</u>
	<b>`</b>
(ħ)	Was the equipment operated during the thermal aging
(1)	(Yes/No/NA)? <u>NA</u> (Reference: <u>NA</u>
	JUSTIFICATION/COMMENTS Qualified life determined by
	Material Analysis rather than accelerated aging test on
	the assembled device.
(5) Rad	iation Aging Exposure:
(a)	Was radiation aging exposure considered in the qualific program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1, pages</u>
	D-7 and D-36
	JUSTIFICATION/COMMENTS None
·	······································
(Ъ)	Were the materials susceptible to radiation degradation identified in the qualification program (Yes/No/NA)? <u>1</u> (Reference: <u>NA</u>
	JUSTIFICATION/COMMENTS Assembled test speciment
	irradiated to 204 megarads.
(c)	Was the basis for radiation aging exposure identified the qualification program (Yes/No/NA)? <u>NA</u> (Reference: <u>NA</u>
	JUSTIFICATION/COMMENTS 204 Megarads exposed the switc
	to a greater radiation dose than expected for the serv
	to a steater radiación dose than expected ita and dos

245 N

PAGE B-12 R1

BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 11_OF_28
R_1_R BINDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86
SWITCHES MANUFUNCTORED BETWEEN           FEB. 20, 1978 AND OCT. 1, 1981         CHECKED NAP DATE 6/27/86 JOH           2-22-89
H. AGING (Continued) -
(d) In the radiation test exposure does and does rate
acceptable (Yes/No/NA)? <u>Yes</u> (Reference:
<u>TAB D-1, p D-36</u> ). R1
Plant normal ambient radiation 7 dose (rd) <u>2 x 10</u>
Test exposure dose (rd) $2.04 \times 10^8$
Test exposure dose rate (rd/hr) <u>1.2 x 10⁶</u>
Test exposure source type (e.g., Co-60 gamma) <u>Co-60 Gamma</u>
JUSTIFICATION/COMMENTS None
(6) Vibration (non-seismic) Aging:
(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program* <u>Yes</u> (Reference:
<u>TAB D-1, page D-32</u> ). R1
JUSTIFICATION/COMMENTS None
(b) Was the basis for vibration aging identified and justified in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1, page D-32</u> ). R1
JUSTIFICATION/COMMENTS See TAB C. Section 7
(7) Operational Stress Aging:
(a) Were the effects of electrical, mechanical, and process operational stresses induced during normal and abnormal operation adressed in the qualification program (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1, pages</u> )
<u>D-47 and D-48</u> ).
JUSTIFICATION/COMMENTS <u>Wear cycling - 100,000 cycles.</u>
* Qualification program refers to the test report and any supple- mental documentation including TVA analyses in TAB C of the Binder.



BINDER 2	TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86
SWITCHES	MANUFUACTURED BETWEEN 2-22-69
<u>FED. 20</u>	<u>1970 AND UCI. 1, 1901</u> CHECKED <u>INAF</u> DAIE <u>0/27/00-10A</u> 2-22-89
н. <u>АСЦ</u>	<u>IG</u> (Continued)
(7)	(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (Yes/No/NA)? Yes (Reference: TAB D-1
	page_D-6
	JUSTIFICATION/COMMENTS <u>See Section P(1) for additions</u>
	discussion
(8)	Was the qualified life of the equipment and its basis define in the qualification program (Yes/No/NA)? <u>Yes-See TAB B, ps</u> (Reference: <u>NA</u>
	Qualified life (Document in QMDS) <u>40 years</u>
	JUSTIFICATION/COMMENTS <u>See TAB C - Material Analysis for</u>
	qualified life.
	•
(9)	Were replacement intervals for the equipment or its compone defined in the qualification program (Yes/No/NA)? <u>No –</u> See TAB B. page 16 for discussion
	(Reference: <u>NA</u>
	Replacement Intervals (Document in QMDS) See QMDS - TAB G.
	JUSTIFICATION/COMMENTS None
	· · · · · · · · · · · · · · · · · · ·

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WBNEQ-IZS-004

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Page <u>B-15</u> was deleted per revision <u>1</u>.

BINDER TITLE NA	MCO EA740 LIMIT COMPUTE	ED WCG DATE 5/22/86 Rodel
SWITCHES MANUFU	JACTURED BETWEEN	
FEB. 20. 1978 A	ND OCT. 1. 1981 CHECKEI	DNAPDATE <u>6/27/86</u> <u>TDH</u>
	1	2-22-89
H. <u>AGING</u> (Con	itinued)	
Qualified I	Life - H(8)	
4		
<u>The qualifi</u>	led life for all equipment	covered by this binder is 40
years throu	ugh periodic refurbishment.	For further discussion on
<u>Materials A</u>	<u>Inalysis and Arrhenius Meth</u>	nodology, refer to material
<u>analysis di</u>	scussion found in TAB C. S	Section 6. The scheduled
maintananaa		
maincenance	Service times snown below	Come directly from this
<u>Arrhenius c</u>	urve.	
	Max Normal Ambient	Service Time
- <del>-</del>	<u>75°F</u>	> 40 yrs.
	110°F	14.2 yrs.
	12095	<b>8</b> 6 mm a
	120 F	<u>8.0 yrs.</u>
		•••
The OMDS Se	ection found in TAB G will	document the limit switches
which requi	<u>re refurbishment and the a</u>	ppropriate schedule.
		· · · · · · · · · · · · · · · · · · ·
	······································	
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BIN	DER TITI	E NAMCO EA7	40 T.TMTT	COMPUTED	WCC	DATE 6/2	K	
SWIT	CHES MA	NUFACTURED	BETWEEN			DAIL <u>072</u>	0/00	0/22/80 6
FEB	. 20. 19	78 AND OCT.	1, 1981	CHECKED	ΝΔΡ	DATE 6/2	7/86	
						DAIL <u>072</u>	<u>//0</u> 0_	<u> </u>
							4	2/22/09 -1
I.	MATERIA	LS ANALYSIS						
			•.		.•			
	Identif	fication of	Materials	Susceptible	e to Sig	nificant	The	-mal
	and/or	Radiation D	egradation	and Aging	(Use Se	ction C	of Bi	inder
	for Det	ailed Mater	ials Analy	vsis).	<b>、</b>			
			. •					
				Radiation		Activ	atior	1
	Mater	ial/Propert	y/Function	Threshold	Referen	ce Ene	rgy	Referen
			Top/Bott	om				TAB C.
	(a)* <u>Sil</u>	icone Rubbe	r/Gaskets	NA	NA	1.1	4 eV	Section
								TAB C.
	(b) <u>EPD</u>	M/O-Rings		NA	NA	0.9	4 eV	Section
	Gla	ss Filled P	olyester/					TAB C.
	(c)* <u>Con</u>	tact Block	-	NA	NA	0.5	0 eV	Section
	Asb	estos Fille	đ					TAB C.
	(d) <u>Phe</u>	nolic/Conta	<u>ct Carrier</u>	NA	<u> </u>	0.9	9_eV	Section
						Not		TAB C.
	(e) <u>Lub</u>	ricant	• • • • • • • • • • • • • • •	NA	NA	Requi	ređ	Section
	JUSTIFI	CATION/COMM See Page E	ENTS <u>See</u> -14 for ch	TAB C, Sect	ion 6 f	or furth terials	er an thru	January
·	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als	ENTS <u>See</u> -14 for ch o seè Page	TAB C, Sect ange histor C-74A for	ion 6 f y of ma current	or furth terials contact	er an thru bloc	January k and
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o see Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	lalysis. January k and
·	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f y of ma current	or furth terials contact	er an thru bloc	alysis. January k and
·	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f y of ma current	or furth terials contact	er an thru bloc	alysis. January k and
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o see Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f y of ma current	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o see Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o see Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January
	JUSTIFI  *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials 	er an thru bloc	January January k and
	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials 	er an thru bloc	January January k and
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o see Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials 	er an thru bloc	January K and
	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI  *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI <u>*NOTE:</u>	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> <u>-14 for ch</u> <u>o seè Page</u> <u>terial</u> .	TAB C, Sect ange histor C-74A for	ion 6 f	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI  *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect	ion 6 f	or furth terials 	er an thru bloc	January January k and
•	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect ange histor	ion 6 f	or furth terials contact	er an thru bloc	January January k and
	JUSTIFI *NOTE:	CATION/COMM See Page E 1984. Als carrier ma	ENTS <u>See</u> -14 for ch o seè Page terial.	TAB C, Sect	ion 6 f	or furth terials contact	er an thru bloc	January January k and

SWII FFB	CHES	TLE NAMCO EA/40 LIMIT COMPUTED WCG DATE 6/25/86 2004 MANUFUACTURED BETWEEN 1978 AND OCT 1 1981 CHECKED NAP DATE 6/27/86 JDH
<u>r.c.</u> ,	<u> </u>	2-22-89
J.	<u>EQUI</u> PERF	PMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE ORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDI
	(1)	Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-2, page D-60</u>
		Identify Acceptance Criteria: <u>See page B-19</u>
	(2)	Performance Characteristics: Does the report/analysis prove the performance characteristics for the equipment which show be verified before, after, and periodically during the test judge equipment performance (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1</u> , page D-6 and pages D-35, D-36, D-37,
		<u>D-39 and D-40</u> Identify baseline and functional testing: <u>See page B-19</u>
	·	JUSTIFICATION/COMMENTS None
	(3)	Does the qualification report/analysis describe loads (or lo combinations) applied during DBE test (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1, pages D-39 and D-40</u>
		JUSTIFICATION/COMMENTS None

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FEBRUARY 20, 1978 AND	D BETWEEN D OCTOBER 1, 1981CHECKED The DATE 6/27/8
J. <u>EQUIPMENT ELECT</u> SPECIFICATIONS	RICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE CAN BE SATISFIED UNDER ACCIDENT CONDITIONS (Continued)
<u>Item J(1) - (1) Fail</u>	ure of one or more contact pairs to test as open when the
<u>unit is in such a co</u>	ndition that said contacts would normally be open.
(2) Failure of one o	r more contact pairs to test as closed when the unit is in
such a condition tha	t said contacts would normally be closed. (3) Shorting of
any contact to the u	nit housing. (4) Shorting of any two contacts which are no
of the same pair. (5	) The opening of a closed contact for more than two milli-
<u>seconds during seism</u>	ic testing.
<u>Item J(2) - (1) Befo</u>	re: o open and closed circuit performance measured and
	recorded.
	o meggar and conductivity (amps) during WEAR TEST
	(0.086A@100VDC).
	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test
	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC).
(2) Duri;	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test ( and the test (addition to the test)
(2) Duri	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test (.086A@100VDC).
(2) Duri: (3) After	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test (.086A@100VDC). r: o meggar and conductivity (0.086A@100VDC).
(2) Duri (3) After	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test (.086A@100VDC). r: o meggar and conductivity (0.086A@100VDC).
(2) Duri (2) Duri (3) Afte	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test (.086A@100VDC). r: o meggar and conductivity (0.086A@100VDC).
(2) Duri; (3) Afte	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test (.086A@100VDC). r: o meggar and conductivity (0.086A@100VDC).
(2) Duri (3) Afte	(0.086A@100VDC). o meggar and conductivity (amps) during radiation test and seismic test (86mA@100VDC). ng: o meggar and conductivity during LOCA Test (.086A@100VDC). r: o meggar and conductivity (0.086A@100VDC).

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	BINDER	NO. WBN	<u>1E0-125-00</u> 4 E	LANT WBN	UNIT(S) 1	SHEET 17 0	F_28
	BINDER SWITCH FEB. 2	 TITLE <u>N</u> ES MANUI 0. 1978	IAMCO EA740 I TUACTURED BEI AND OCT. 1.	.IMIT COMPUTED WEEN 1981 CHECKED	WCG DATE 5	R_1R 122/86/10100 127/86_T04	
	<u>* 42 - 4</u>			<u></u>		2-22-89	
	J. <u>e</u> P	OUIPMENT ERFORMAN	<u>ELECTRICAL</u>	CHARACTERISTICS NE TIONS CAN BE SATIS	CESSARY TO E FIED UNDER A	- <u>NSURE THE</u> CCIDENT CONDIT	- IONS
	(	Continue	ed)				
	(	4) Do t oper	the applied l cating condit	oads during baseli ions (Yes/No/NA)?	ne testing r <u>Yes</u> (Refe	eflect normal rence:	
		<u>Se</u>	e J(5) comme	nts page B-22			). R1
		JUSI	IFICATION/CO	MMENTS None			
	C	5) Iden equí	tify electri pment perfor	cal characteristic mance specification	s necessary ns can be sa	to ensure the tisfied.	
		(a)	Parameter	Plant Normal Con	ditions	Reference	
			Voltage	See Comments		NA	
S. 2			Load	See Comments		NA	
			Frequency	NA		NA	
			Accuracy	<u>NA</u>		NA	R1
			Other(s)				
		,					
			JUSTIFICATI	ON/COMMENTS See	I(5) Comments	page B-22	
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			<u> </u>				
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'	BINDER N	O. <u>WBNEQ-IZS-00</u> 4	PLANT WBN UNIT(S) 1	_ SHEET <u>18</u> OF <u>28</u>  R1
	BINDER T SWITCHES	ITLE <u>NAMCO EA740</u> MANUFUACTURED BE	LIMIT COMPUTED WCG DATE	R_1, R 6/25/86 / 10-4 7-22-59
	<u>FEB. 20.</u>	<u>1978 AND OCT. 1.</u>	<u>1981</u> CHECKED <u>NAP</u> DATE	<u>6/27/86 -704</u> 2-22-89
	J. <u>EQU</u> <u>PER</u> (Co	IPMENT ELECTRICAL FORMANCE SPECIFIC ntinued)	CHARACTERISTICS NECESSARY TO CATIONS CAN BE SATISFIED UNDER	ENSURE THE - ACCIDENT CONDITIONS -
	(Ъ)	Parameter	Specific Accident Conditions	Reference
		Voltage	See Comments	NA
		Load	See Comments	<u>NA</u> R1
		Frequency	NA	NA
		Accuracy	NA	NA
		Other(s)		
		JUSTIFICATION/C	COMMENTS <u>See J(5) Comments pag</u>	e B-22
	(c)	Parameter	Demonstrated Conditions	<u>Reference</u>
	•	Voltage	125V AC/DC	$\begin{array}{c} \text{TAB } D=1, \ p \ D=0 \\ \text{TAB } I, \ p \ I=3 \end{array}$
		Load	100VDC/86MA.100VAC/500MA	T <u>AB D-1, p D-6</u>
		Frequency	NA	<u>NA</u> R1
		Accuracy	NA	<u>_NA</u>
		Other(s) Open Contact		
		<u>Resistanc</u> e Closed Contact	40,000 OHMS	T <u>AB D-1, p D-40</u>
		<u>Open &lt; 2m</u> s	<u> 2ms</u>	T <u>AB D-1, p D-26</u>
		JUSTIFICATION/C	OMMENTS <u>The typical applicati</u>	on of these limit
		<u>switches is in</u>	the control circuits of, for e	xample, solenoid
		operated valves	. These circuits operate at 1	20VAC or 125VDC
		with current ra	tings of approximately 0.3 to	1.3 amps. This
		<u>is well within</u>	the UL and nameplate ratings o	<u>f 20 amps at</u>
		125VAC and 5 am	ps at 125VDC.	·

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NDER NO. <u>WBNEQ-12S-00</u> 4 PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>19</u> OF <u>28</u> R <u>1</u> R
NDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/20/86
B. 20, 1978 AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 JDH
. 2-22-89
• EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITION (Continued)
J(5) - JUSTIFICATION/COMMENTS (Continued)
The demonstrated load of 0.5 amps @ 100VDC for mechanical aging and
0.086 amps @100VDC for all other performance tests is considered
adequate for the following reasons:
(1) Low voltages and currents may not break down the films/oxides
and therefore provide little content surface recurs
and therefore provide fittle contact surface renewal.
(2) When switches are operated at rated voltages and currents, the
<u>contact surfaces tend to be self-cleaning and/or the potential</u>
of the circuit is sufficient to break down films or oxides that
might form on the contact faces.
(3) Since TVA's standard design practices prevent circuits from
exceeding the UL ratings of the contacts, the 100VDC and 0.086
amp load used for testing is conservative and adequate
<u>considering items (1) and (2) above.</u>
while there are no plant specific requirements with regard to
contact bounce and open contract resistance minimums, the values
demonstrated are considered adequate. At 40,000 ohms, there would
be a slight leakage current of approximately 3.1 milliamps for a
typical 125V circuit. This small leakage current should not
provide enough amperage to cause any adverse circuit operations

PAGE B-22 R1



BINDER NO. <u>WBNEQ-IZS-00</u> 4 PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>20</u> OF <u>2</u> R 1 R	8_
BINDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86	
SWITCHES MANUFUACTURED BETWEEN	
2-22-89	_
K.1 <u>REQUIRED OPERATING ENVIRONMENT</u> – UPPER COMPARIMENT –	_
Reference Environmental Drawing No. <u>47E235-41</u>	R1
(1) Normal Max (2) Abnormal Max	
(a) Temperature (°F) <u>110</u> (a) Temperature (°F) <u>120</u>	
(b) Pressure (psig) <u>0.3</u> (b) Pressure (psig) <u>0.3</u>	
(c) Humidity (%) <u>80</u> (c) Humidity (%) <u>90</u>	
(d) Radiation (rd) <u>1 x 10⁶</u> (d) Radiation (rd) <u>NA</u>	R1
(3) Process Interfaces: <u>None</u>	
·	
(4) State anticipated occurrence frequency and duration of abnormal	
conditions: Abnormal conditions could exist up to eight hours	
per excursion and will occur less than 1 percent of the plant	
<u>life (effect on qualified life is negligible - (See generic</u>	
position in Binder No. WBNEO-GEN-001).	
(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):	
(a) Temperature (°F) <u>161</u> Accident type <u>LOCA/HELB</u>	
(b) Pressure (psig) <u>10.9</u> Accident type <u>LOCA/HELB</u>	31
(c) Humidity (%) <u>100</u> Accident type <u>LOCA/HELB</u>	
4.7x10°beta (d) Radiation (rd) 3 <u>.8x10</u> 7gamma Accident type LOCA	31
(e) Spray Type <u>*</u> Accident type <u>LOCA/HELB</u>	
$\Rightarrow$ *0.19 molar HeBOs (2000 ppm Boron) 0.033 molar NaOH resulting	
in a pH of 8.3 at 25°C. The duration of the containment spray is 30 days, at a flow rate equal to 9500 gal/min. or 0.92 gpm per square foot of containment.	R1

PAGE B-23 R1

	TTE NAMOO EA 740 I IMIT		UNIT(S) <u>I</u> SHEET <u>20a</u> OF <u>28</u> $R_{1}$ $R_{}$	 
SWITCHES	MANUFUACTURED BETWEEN		WCG DATE 0125780 (4797 <i>T-72-89</i>	
<u>FEB. 20.</u>	1978 AND OCT. 1, 1981	CHECKED	<u>NAP</u> DATE <u>6/2//86_JDA</u> 2 <b>.2</b> 2-89	
		· · · · · · · · · · · · · · · · · · ·	······································	i
K.2 <u>REQU</u>	IRED OPERATING ENVIRON	<u>MENT</u> – LOWER	COMPARIMENT -	1
Refe	rence Environmental Dr	awing No. <u>47E</u>	235-42	_  _
(1)	Normal Max	(2) A	bnormal Max	
	(a) Temperature (°F)	(	a) Temperature (°F) <u>130</u>	-
	(b) Pressure (psig)	0.3 (	b) Pressure (psig) <u>0.3</u>	-
	(c) Humidity (%)	_80(	c) Humidity (%) <u>100</u>	_
	(d) Radiation (rd)	$\frac{2 \times 10^{7}}{2 \times 10^{7}}$ (	d) Radiation (rd) <u>NA</u>	_[]
(3)	Process Interfaces:	None		-
				_
<b>(4)</b>	State anticipated occ	urrence frequ	ency and duration of abnorm	<b>a</b> 1
	conditions: <u>Abnormal</u>	<u>conditions</u> c	ould exist up to eight hour	5
	per excursion and wil	<u>l occur less</u>	than 1 percent of the plant	-
	life (effect on quali	<u>fied life is</u>	negligible - (See generic	-
	position in Binder No	. WBNEQ-GEN-C	01).	-
	Accident (worst case	for any combi eak, duration	nation of specified acciden , and profile):	-
(5)	parameter including p	-		t
(5)	<pre>parameter including p (a) Temperature (°F)</pre>	327	Accident type LOCA/HELB	- t
(5)	<ul><li>parameter including p</li><li>(a) Temperature (°F)</li><li>(b) Pressure (psig)</li></ul>	<u> </u>	Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u>	- t
(5)	<ul> <li>parameter including p</li> <li>(a) Temperature (°F)</li> <li>(b) Pressure (psig)</li> <li>(c) Humidity (%)</li> </ul>	327 <u>10.9</u> <u>100</u> <u>4.7x108</u> bots	Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u>	- - -
(5·)	<ul> <li>parameter including p</li> <li>(a) Temperature (°F)</li> <li>(b) Pressure (psig)</li> <li>(c) Humidity (%)</li> <li>(d) Radiation (rd)</li> </ul>	<u> </u>	Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u> Accident type <u>LOCA</u>	   
(5)	<ul> <li>parameter including p</li> <li>(a) Temperature (°F)</li> <li>(b) Pressure (psig)</li> <li>(c) Humidity (%)</li> <li>(d) Radiation (rd)</li> <li>(e) Spray Type</li> </ul>	<u>327</u> <u>10.9</u> <u>100</u> <u>4.7x10⁸ beta</u> <u>4x10⁷ gamma</u>	Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u> Accident type <u>LOCA/HELB</u>	  

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		DPERATING ENVIRON	<u>ment</u> – annui	LUS			
Refe	erence	Environmental Dr	awing No4	<u>47E235-</u>	-44	•	
(1)	Norma	al Max	(2)	Abnor	nal Maz	ĸ	
	(a)	Temperature (°F)	110	(a) 1	Cempera	ature (°F	) <u>120</u>
	(b)	Pressure (psig)	<u>ATM(-)</u>	<b>(b)</b>	Pressu	re (psig)	<u>ATM(-)</u>
	(c)	Humidity (%)	_80	(c) 1	Humidi	ty (%)	90
	(d)	Radiation (rd)	<u>1x10</u>	(d)	Radiat	ion (rd)	NA
(3)	Proc	ess Interfaces:	None				
(4)	State cond:	e anticipated occ itions: <u>Abnormal</u>	urrence free . conditions	quency could	and du exist	uration o <u>up to ei</u>	f abnorma ght hours
(4)	Stat cond <u>per</u> <u>life</u> posi	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> tion in Binder No	currence fre <u>conditions</u> <u>l occur les</u> <u>fied life i</u> . WBNEQ-GEN	quency could s than s negl -001).	and d exist 1 per igible	uration o <u>up to ei</u> cent of t - (See g	f abnorma ght hours he plant eneric
(4)	Stat cond <u>per</u> <u>life</u> <u>posi</u>	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> <u>tion in Binder No</u>	currence free <u>conditions</u> <u>l occur les</u> <u>fied life i</u> <u>. WBNEQ-GEN</u>	quency <u>could</u> <u>s than</u> <u>s negl</u> -001).	and d exist l per igible	uration o <u>up to ei</u> <u>cent of t</u> <u>- (See g</u>	f abnorma ght hours he plant eneric
(4)	Stat cond <u>per</u> <u>life</u> <u>posi</u> Acci para	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> <u>tion in Binder No</u> dent (worst case meter including p	currence free conditions l occur less fied life i WBNEQ-GEN for any com peak, durati	quency could s than s negl -001). binati on, an	and du exist l per igible on of d prof	uration o <u>up to ei</u> <u>cent of t</u> <u>- (See g</u> specified ile):	f abnorma <u>ght hours</u> <u>he plant</u> eneric accident
(4) (5)	Stat cond <u>per</u> <u>life</u> <u>posi</u> Acci para (a)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F)	currence free conditions <u>l occur les</u> fied life in <u>b. WBNEQ-GEN</u> for any com peak, durati <u>133.7</u>	quency <u>could</u> <u>s than</u> <u>s negl</u> -001). binati on, an _ A	and du <u>exist</u> <u>l per</u> <u>igible</u> on of d prof cciden	uration o <u>up to ei</u> <u>cent of t</u> <u>- (See g</u> specified ile): t type <u>LO</u>	f abnorma ght hours he plant eneric accident
(4)	Stat cond <u>per</u> <u>life</u> <u>posi</u> Acci para (a) (b)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F) Pressure (psig)	for any com beak, durati 133.7 ATM(-)	quency could s than s negl -001). binati on, an _ A _ A	and du exist l per igible on of d prof cciden cciden	uration o <u>up to ei</u> <u>cent of t</u> <u>- (See g</u> specified ile): t type <u>LO</u> t type <u>NA</u>	f abnorma ght hours he plant eneric accident
(4)	Stat cond <u>per</u> <u>life</u> <u>posi</u> Acci para (a) (b) (c)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%)	currence free conditions <u>l occur les</u> <u>fied life in</u> <u>, WBNEQ-GEN</u> for any com peak, durati <u>133.7</u> <u>ATM(-)</u> <u>61</u>	quency <u>could</u> <u>s than</u> <u>s negl</u> -001). binati on, an _ A _ A	and du <u>exist</u> <u>l per</u> <u>igible</u> on of d prof cciden cciden cciden	uration o <u>up to ei</u> <u>cent of t</u> <u>- (See g</u> specified ile): t type <u>LO</u> t type <u>NA</u> t type <u>LO</u>	f abnorma ght hours he plant eneric accident CA/HELB
(4)	Stat cond <u>per</u> <u>life</u> <u>posi</u> Acci para (a) (b) (c) (d)	e anticipated occ itions: <u>Abnormal</u> <u>excursion and wil</u> <u>(effect on quali</u> <u>tion in Binder No</u> dent (worst case meter including p Temperature (°F) Pressure (psig) Humidity (%) Radiation (rd)	currence free conditions <u>l occur les</u> <u>fied life i</u> <u>. WBNEQ-GEN</u> for any com peak, durati <u>133.7</u> <u>ATM(-)</u> <u>61</u> * <u>1.2x10</u> ⁷	quency <u>could</u> <u>s than</u> <u>s negl</u> -001). binati on, an _ A _ A _ A	and du exist l per igible on of d prof cciden cciden cciden	uration o <u>up to ei</u> <u>cent of t</u> <u>- (See g</u> specified ile): t type <u>LO</u> t type <u>LO</u> t type <u>LO</u> t type <u>LO</u>	f abnorma ght hours he plant eneric accident OCA/HELB

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<u>reb, 20</u>	S MANUFUACTURED BETWEEN         2.22.24           1978 AND OCT. 1, 1981         CHECKED NAP DATE 6/27/86 JOH           2.22.89
K.4 <u>RE</u>	UIRED OPERATING ENVIRONMENT - IIR -
Re	Terence Environmental Drawing No. <u>47E235-45</u>
(1	Normal Max (2) Abnormal Max
	(a) Temperature (°F) <u>75</u> (a) Temperature (°F) <u>120</u>
	(b) Pressure (psig) <u>0.3</u> (b) Pressure (psig) <u>0.3</u>
	(c) Humidity (%) <u>60</u> (c) Humidity (%) <u>90</u>
	(d) Radiation (rd) <u>3.5x10</u> (d) Radiation (rd) <u>NA</u>
(3	) Process Interfaces: <u>None</u>
	per excursion and will occur less than 1 percent of the plant
	per excursion and will occur less than 1 percent of the plant life (effect on qualified life is negligible - (See generic position in Binder No. WBNEQ-GEN-001).
(5	<pre>per excursion and will occur less than 1 percent of the plant life (effect on qualified life is negligible - (See generic position in Binder No. WBNEQ-GEN-001). Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):</pre>
(5	<pre>per excursion and will occur less than 1 percent of the plant life (effect on qualified life is negligible - (See generic position in Binder No. WBNEQ-GEN-001). Accident (worst case for any combination of specified accident parameter including peak, duration, and profile): (a) Temperature (°F) Accident type LOCA/HELB</pre>
(5	<pre>per excursion and will occur less than 1 percent of the plant life (effect on qualified life is negligible - (See generic position in Binder No. WBNEQ-GEN-001). </pre>
(5	<pre>per excursion and will occur less than 1 percent of the plant life (effect on qualified life is negligible - (See generic position in Binder No. WBNEQ-GEN-001). </pre>
(5	<pre>per excursion and will occur less than 1 percent of the plant life (effect on qualified life is negligible - (See generic position in Binder No. WENEQ-GEN-001). </pre>
(5	per excursion and will occur less than 1 percent of the plant         life (effect on qualified life is negligible - (See generic         position in Binder No. WBNEQ-GEN-001).

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BINDER NO.	<u>WBNEQ-IZS-004</u> PLANT WBN UNIT(S) 1 SHEET 20d OF 28 R_3 R
BINDER TIT	LE NAMCO EA740 LIMIT COMPUTED WCG DATE <u>8/14/86</u> 9/25/99
FEB. 20. 1	978 AND OCT. 1, 1981 CHECKED NAP DATE 8/15/86 CATA
	·//////9
K. <u>REQUI</u>	RED OPERATING ENVIRONMENT (Continued)
	Comments (duration/peak/profile/spray composition and pH, margin, etc.): <u>None</u>
(6)	Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design basis accident conditions (Yes/No/NA)? Yes (Reference:
	See Tab G
(7)	Subject to submergence (Yes/No/NA)? <u>No</u> (Reference:
	TAB C, Section 1).
	Identify initiation time and duration of submergence: <u>NA</u>
(8)	Is the equipment subject to a beta radiation contribution to the total accident dose (Yes/No/NA)? <u>Yes</u> (Reference: <u>See Section P. 2.0 (12)(b), page B-35, B-36,</u>
	B-37 and B-38
	If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify:
	<u>See Section P, 2.0 (12)(b), page B-35, B-36 &amp; B-37 and B-38</u>
(9)	Special environmental calculations (temp., rad., etc.)
	Type RIMS No.
	See TAB B, Section A
	· · · · · · · · · · · · · · · · · · ·

WBEP-0095Q

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BINDER NO. WBNEQ-IZS-004 PLANT	WBN	UNIT(S) <u>1</u> SHEET <u>21</u> OF <u>28</u>
		R <u>1</u> R <u>2</u>
BINDER TITLE NAMCO EA740 LIMIT	_ COMPUTED_	WCG DATE 6/26/86 CAG WCA
SWITCHES MANUFACTURED BETWEEN		2/22/89 6-6-90
FEB. 20, 1978 AND OCT. 1, 1981	_ CHECKED	<u>NAP</u> DATE <u>6/27/86_JDH</u>
		2/22/89 6/8/90
L. <u>SUMMARY COMPARISON OF TEST</u>	CONDITIONS	TO SPECIFIED CONDITIONS
	•	
(1) Comparison of worst-ca	se maximum	parameters:
Beremeter	Constrated	Demonstrate D. C.
rarameter	<u>Specified</u>	Demonstrated Reference
		$\begin{bmatrix} 1AB & D-1 \\ 0 & 0 \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$
Operating Time	100 dawa	$\approx P D - 41 CHru$
operacing time	TOO MAAR	$\underline{\text{JO}}$ $\underline{\text{days}}$ $\underline{\text{J}}$
Temperature (°F)	377	$1 \text{AD}  \text{D}^{-1},$
	<u> 241</u>	$\frac{D}{2} \frac{D}{2} \frac{D}$
Pressure (nsig)	123	$\frac{1 \text{ AD } D^{-1}}{23 \text{ thm}} \frac{p}{D-41}$
	<u>12.J</u>	$\underline{-35 \dots -1} \qquad \qquad$
Relative Humidity (%)	100	$100 \qquad \qquad \text{thru} \ D_{-46}$
	See TAB C.	See TAB C. See TAB C
	p C-71 &	p = C - 71 & p = C - 71 &
Chemical Spray*	G-72	C-72 $C-72$
		<u> </u>
5.	12x10 ⁷ beta	TAB D-1.
Radiation (rd)**	<u>6x10</u> 7gamma	2 <u>.04x10 gamma p D-15</u>
		TAB C,
Submergence	<u>NA</u>	<u>NA p C-3</u>
	•	
*Includes spray concent	ration, flow	vrate, density, duration, and
	• • •	
**Enter 40-year integrat	ed normal do	ose plus integrated accident
uose and specify type.	(Keterence	e also p. B-36 of this TAB.) R2
instrument misseliters	peak pressu	re or 90 psig due to test
i instrument miscalibrat	ion (Appendi	LX Ľ).

(2) Comparison of worst-case profiles and margin assessment:

	Test Profile Envelopes Specified	
Parameter	(Yes/No/NA)	Reference
Temperature	Yes	TAB C, Section 2
Pressure	<u>Yes</u>	See L(1)
Relative Humidity	Yes	<u>See L(1)</u>
Chemical Spray	Yes	<b>TAB C, pages</b> <u>C-71 &amp; C-72</u>
Submergence	NA	TAB C, page C-3
JUSTIFICATION/COMMENTS	+Justification for	long term opera-
<u>bility (30 days vs. 100</u>	days) is given in 1	TAB C, Section 2.

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BINDER NO. WENEQ-IZS-004 PLANT WEN UNIT(S) 1 SHEET 22 OF R 2 R	28
	[
BINDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/27/86	
SWITCHES MANUFACTURED BETWEEN	
<u>2-20-78 AND 10-1-81</u> CHECKED NAP DAIL <u>0/2/780</u> (AN)	
L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS</u> (Continued)	
(3) Were margins applied to the test parameters or otherwise addressed in the test program to assure that normal variation and uncertainties are accounted for? (Note margin applied, Yes/No/NA).	
Margin	
Suggested Margins per IEEE-323(74) Applied Yes/No/NA	<u> </u>
Temperature: +15 degrees F <u>+29,F</u> <u>Yes</u>	
Pressure: +10% but no more than 10 psig <u>70.7 psig</u> <u>Yes</u>	.
Radiation: +10% of accident dose <u>9.3 x10</u> Yes	R2
Time: +10% (or 1 hour + operating time TAB C, per NUREG-0588) <u>Section 2</u> Yes	
Voltage: ±10% of rated value <u>NA</u> <u>NA</u>	
Frequency: ± 5% of rated value <u>NA</u> <u>NA</u>	
Environmental Transient: the initial transient and the peak temperature <u>2 Dwells</u> <u>Yes</u> applied twice	
217%	
Vibration: +10% added to acceleration <u>See Comment Yes</u>	
JUSTIFICATION/COMMENTS <u>Per TVA Standard Specification</u>	.
<u>SS-E18-12.01 - Seismic Requirements for Category I Electrical</u>	.
and I&C Equipment - these limit switches should be tested to	
3 g's horizontal and 2 g's vertical. Since NAMCO verified in	
their test report (page 5) that cross-coupling was not signi-	
ficant, the single axis test performed in each of the 3 axes	
to 9.52 g's was more than adequate.	

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WBEP-0095Q

BINDE	R NO	$\frac{\text{WBNEO}-\text{IZS}-004 \text{ PLANT} \text{WBN}}{\text{NIT}(S)} \text{ I SHEET } 23 \text{ OF } 28}$
SWITC FEB.	HES 1 20.	MANUFACTURED BETWEEN
М.	OPER	ABILITY TEST RESULTS
	(1)	Identify the safety function(s) of this equipment: (Reference: <u>See TAB A</u>
		JUSTIFICATION/COMMENTS None
	(2)	Did the equipment perform its intended function during the simulated design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1. pages D-39 and D-40</u>  R1
		JUSTIFICATION/COMMENTS None
	(3)	Did the equipment perform its intended function during the simulated post-design basis accident exposure (Yes/No/NA)? <u>Yes</u> (Reference: <u>TAB D-1. pages D-39 and D-40</u>  R1
		JUSTIFICATION/COMMENTS <u>None</u>
	(4)	Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (Yes/No/NA)? Yes (Reference: See TAB C,
		). JUSTIFICATION/COMMENTS None).


B	BINDE	R NO.	WBNEQ	-IZS-C	04 PL	ANT_	WB N		UNIT(S)	1		SHE	ET _	4	OF
-	SWII SWII FEBF	R TITL CHES WARY	E NAM MANUFA 20, 19	CO EA7 CTUREI 78 ANI	740 LI D BETW D OCTO	MIT EEN BER 1,	CO ¹⁹⁸¹ CI	MPUTE HECKED	D <u>wa</u>	<u>n</u> da P da	TE <u>5-2</u>	7/86	R	R 	
	N.	MAINT	ENANCE	AND S	SURVEI	LLANCH	3								
		Has t and i which (yes/ Binde JUSTI	he qua nspect aid i no/NA) r - Qu FICATI	lifica ion pa n dete ? <u>Yes</u> alific ON/COM	ation aramet ecting (Ent cation AMENTS	progra ers wi degra er all Maint <u>See</u>	am iden nich an ading m l requi cenance QMDS -	ntified re esse nateria rement Data - TAB (	d those ential als or ts in S Sheets G.	surve: to main equipme Section	illanco ntain o ent per G of f	e, mai qualif rforma the	nten icat ince	ance ion	and
			<u></u>				<u></u>						- <u>-</u>		
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	BIND	er no	DWBNEQ-IZS-004 PLANTWBNUNIT(S)1	_ SHEET _25_ OF _2
	війн	ER H	ILE NAMCO EA740 LIMIT COMPUTED UCT DATE	25/86
	FEB	RUAR	2 20, 1978 AND OCTOBER 1, 1981 CHECKED $\frac{M_{1}}{M_{2}}$ DATE $\frac{1}{2}$	7/86
	0.	SUM	MARY OF REVIEW	Nog/No/NA
				IES/ NO/ NA
	·	(1)	Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	Yes
		(2)	Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	<u>NA</u>
		(3)	Choice of qualification methodology adequately justified?	Yes
		(4)	If analysis was performed, complete the following:	
			(a) Were equipment performance requirements identified?	NA
		•	(b) Were specific features and failure modes and effects analyzed?	NA
-			(c) Were assumptions and mathematical models used together with appropriate justification for their use?	Yes TAB C, <u>Section 6</u> Yes-See
			(d) Were environmental parameters which affect equipment performance identified?	TAB C, Section 6
		(5)	Adequate similarity between equipment and test specimen established?	Yes
				Yes TAB C
		(6)	Aging degradation evaluated adequately?	Section 6
			(a) Mechanical and/or cycle aging addressed?	Yes NA-See
			(b) Equipment aged to end of life condition prior to application of DBE conditions?	Section P(4)
			(c) Absence of preaging in test/analysis justified?	Section P(4) Yes-See TAB C.
			<pre>(d) Materials susceptible to thermal/radiation     aging identified?</pre>	Section 6
			DACER-37	

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BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 BINDER TITLE NAMCO EA740 LIMIT COMPUTED was DATE 5-27 SWITCHES MANUFACTURED BETWEEN FEBRUARY 20, 1978 AND OCTOBER 1, 1981 CHECKED MAN DATE 5/27	SHEET 26 OF 28 R R 2-86
0. <u>SUMMARY OF REVIEW</u> (Continued) (e) Normally operating state of device (e.g., normally energized) considered?	<u>Yes/No/NA</u> Yes-See Section P(3)
<ul> <li>(7) Qualified life or replacement schedule established?</li> <li>(8) Criteria regarding temperature/pressure exposure satisfied?</li> </ul>	<u>Yes</u>
<ul><li>(a) Peak temperature adequate</li><li>(b) Peak pressure adequate</li></ul>	Yes
<ul> <li>(c) Duration adequate</li> <li>(d) Required profile enveloped adequately</li> <li>(e) Steam exposure adequate</li> </ul>	YesYes
<ul><li>(9) Criteria regarding test sequence satisfied?</li><li>(10) Criteria regarding spray satisfied?</li></ul>	Yes
<ul> <li>(a) Was the spray testing done while under the extremes of pressure and temperature?</li> <li>(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed</li> </ul>	Yes Yes-See TAB C, Section 5
those to be used for the plant? (11) Criteria regarding submergence satisfied? (12) Criteria regarding radiation satisfied?	<u>NA</u> Yes
(a) Was dose rate considered? (b) Was beta radiation considered?	Yes Yes-See Section P(2)
<ul><li>(13) Criteria regarding operability status/mode satisfied?</li><li>(14) Criteria regarding test failures or anomalies satisfied?</li></ul>	Yes

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TVA 19537 (OE-3-86)

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BINDER TITLE NAMEO EA740 LIMIT COMPUTED $\frac{\omega C \mathcal{P}}{\omega C \mathcal{P}}$ DATE SWITCHES MANUFACTURED BETWEEN FEBRUARY 20, 1978 AND OCTOBER 1, 1981 FEBRUARY 20, 1978 AND OCTOBER 1, 1981 CHECKED $\frac{M \mathcal{P}}{\omega C}$ DATE $\frac{1}{2}$	126786
0. <u>SUMMARY OF REVIEW</u> (Continued)	Yes/No/NA
(15) Criteria regarding functional testing satisfied?	Yes
(a) Does the test plan/report specify an acceptance criteria for equipment performed?	Yes
(b) Was an initial base line test done to establish required performance characteristics?	Yes
(c) Has the test/analysis demonstrated that performance performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	e <u>Yes</u>
(16) Criteria regarding instrument accuracy satisfied?	<u>NA</u> Yes-See TAB C
(17) Test duration margin (1 hour + function time) satisfied?	Section 2
(a) Is the minimum specified operating time at least 1 hour?	Yes
(b) If exception to the 1-hour minimum operating time was taken, was adequate justification provided?	NA
(18) Criteria regarding synergistic effects satisfied?	TAB C, Section 16
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified.	Yes
P. <u>DISCUSSION</u>	
1. Aging - Section H(7)(b)	
This device was subjected to 100,000 actuation of	vcles
during mechanical aging testing. This is equive	alent
to an average of 208 actuations per month or app	proximately
7 actuations per day over the 40 year life of the	ne_plant.

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,	. BINDI	ER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 28 OF 28
	BINDI SWIT(	ER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/26/86 CAG 4000 CHES MANUFACTURED BETWEEN
	FEB.	20, 1978 AND OCT 1. 1981 - CHECKED - NAP - DATE 6/27/86 JDH CAR 2-22-89 6/8/90
	Ρ.	DISCUSSION (continued)
		to operate for normal plant operation, R2
		surveillance, and maintenance. Therefore the mechanical
		aging performed is adequate to demonstrate qualification
	•	over the forty year life of the plant.
		2.0(12)(B)-Per_TVA Drawings 47E235-41,42,44 and 45, the attenuated
		free field post-LOCA beta radiation dose contribution for
		inside primary containment is 4.7 x 10 rads. The limit
		switch internals will not, however, be subject to the
		unattenuated free field beta dose. The switch housing
		assembly consists of three rectangular parts; the
		Brownite alloy housing body (a corrosion resistant
		bronze casting alloy) and top and bottom stainless steel
		covers which are tightly bolted to the body. The minimum
		thickness is 1/8". Silicone rubber gaskets 0.030" thick
		are compressed between the housing and top and bottom
		covers at 20-inch pounds, creating a completely sealed
		unit that is water, oil, dust, and pressure tight,
		meeting NEMA type 1, 4, and 13 requirements. Also, all
		limit switches inside primary containment include a
		qualified seal. Therefore, all beta radiation sources
		· · ·

PAGE B-35 R2

WBEP-0084Q

BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 28a OF 28
R_1_R_2 BINDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/25/86 CAG wc7 7-72-89 6-6-90
SWITCHES MANUFACTURED BETWEEN FEB. 20, 1978 AND OCT. 1, 1981 CHECKED NAP DATE 6/27/86 JDH 2-22-89 6/8/90
P. <u>DISCUSSION</u>
will be external to the housing and subject to dose
attenuation due to the housing. The beta dose to the
switch internals will essentially be attenuated
completely by a factor of 0,009 due to the minimum metal
thickness (reference TVA Calculation No. WBNTSR-051 R
TAB C, Section 15 - which is conservative for the bronze
alloy housing). The gap created by the gasket is
sufficiently small to allow only a negligible fraction
of the unattenuated 4-pi geometry free field dose to
penetrate. However, as a conservatism to account for
the gap (without taking credit for attenuation due to
the silicone gasket), 10% of the unattenuated free field
dose is added to the dose attenuated by the metal
housing. Therefore, the 100-day beta dose to the switch
$\underline{\qquad \text{attenuated contribution} = 0.10 (4.7 \times 10) = 4.7 \times 10}_{8}$
$\frac{100\% \text{ attenuated contribution} = 0.009 (4.7 \times 10) = 6}{6}$
$4.23 \times 10$ . Total = 5.12 x 10 rads beta. Additionally,
the silicone gaskets themselves are not a concern. They
receive significant geometric shielding due to being
tightly compressed between the metal housing parts.
Based on the switch geometry, the outer gasket material

BIND	ER NO. <u>WBNEQ-IZS-00</u> 4 PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>28b</u> OF <u>28</u>
BIND	R_1_R ER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/26/86
SWIT	CHES MANUFACTURED BETWEEN Z-ZZ 24
100.	20, 1270 AND UCI, 1, 1901 CHECKED NAP DATE 6/2//86 JDH
	•
Ρ.	DISCUSSION (Continued)
	will be exposed to only a fraction of the unattenuated
	4-pi geometry free field beta radiation dose. This
	unattenuated dose would be further reduced due to the
	angle of incidence into the narrow gap and attenuation
	due to the outer gasket material resulting in minimal
	dose to the innermost gasket material. The gasket width
	is approximately equal to the housing thickness
	(1/8 inch), Also, Target Rock Corp. has conducted tests
	on a similar silicone rubber gasket used in a similar
	application (reference EQ Binder WBNEQ-SOL-001, Section
	D, Page D-29) and found that after exposure to 185
	megarads of gamma radiaiton, embrittlement had occurred
	in the excess gasket material extending beyond the mated
	parts. The gasket material actually trapped between the
	mated parts was still flexible. Likewise, in our
	application, the gaskets would not be a concern even
	should they become brittle due to their being tightly
	sandwiched between the housing and housing covers in a
	static application; especially considering that the
	outer part of the gasket (least important) would exhibit
	the more significant degradation.
	The limit switches also contain EPDM O-rings used for

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PAGE B-37 R1

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•	BINDER NO. WBNEQ-IZS-004 PLANT WBN UNIT(S) 1 SHEET 28c of 28 [R1]
:•	R 1 R 2 BINDER TITLE NAMCO EA740 LIMIT COMPUTED WCG DATE 6/26/86 CAG MCP
	Switches         MANOFACTORED         BETWEEN         2*22*87         6-6-78           FEB. 20, 1978         AND OCT. 1, 1981         CHECKED NAP DATE         6/27/86 JDH         CAF           2*22*89         6/8/90
	P. DISCUSSION
	screw gaskets and the operating shaft seal. These
	0-rings are enclosed by the metal screws and shaft
	housing which shields them from the effects of beta
	radiation, In conclusion: The total combined Beta and
	Gamma radiation dose will equal 9.12 x 10 rads TID
	7 7 7 7 7 7 7 7 (5,12 x 10 Beta + 4.0 x 10 Gamma) for accident condi-
	tions. The accident radiation plus the large lower
	7 compartment 40-year dose of 2.0 x 10 rads equal a total
· · ·	R2
	were tested to 2.04 x 10 rads which envelops our plant
	requirements. Therefore, they are qualified for our
	<u>3. 0(6)(e)-This device operates intermittently at relatively low</u>
	voltages and currents which will not result in a signifi-
i	cant heat rise,
	4. 0(6)(b)&(c)-This equipment is being qualified to NUREG-0588,
	Category II and therefore does not have to be aged
	to an end-of-life condition prior to DBE testing.
	The qualified life was determined by evaluating the
	potential for significant thermal aging degradation
	of the non-metallic materials of construction (See
	TAB C, Section 6).
	PAGE B-38 R2
W	DEF-UU84U

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BINDER NO. WBNEQ-IZS-005       PLANT       WBN       UNIT(S)       1       SHEET       OF	
TAB A	-
NOTES I. No TAB A is provided because the equipment is not installed. TAB A will be added as a binder revision after notification via EQIR that the equipment has been installed. 2 rotk 4/16/40 من 2 190 Dece Back for source of Category and Operating Time assignments.	

S-992

BINDER NO. WBNEQ-IZS-005 PLAN	r wbn	UNIT(S	5)1	SHEET	0F
		_		R	R
BINDER TITLE EA 180 SERIES	COMPUTED_	JDH	DATE	4/20/90	
LIMIT SWITCHES MANUFACTURED		and on		W/a. Jan	t
AFTER DECEMBER 1986	CHECKED		DATE	7120190	

A. <u>DOCUMENTATION</u> (See note at the end of this section)

Equipment Description _	Limit Switch
Vendor/Manufacturer _	NAMCO Controls
Equipment Model No.(s) _	See TAB A

# QUALIFICATION REPORTS

- *1. <u>Title/Number/Revision</u> Generic Qualification of RIMS <u>B26 900320 902</u> EA180 Series Limit Switches/NAMCO Controls Test Report No. QTR155/Revision 0
   DATE <u>Oct. 5, 1987</u>
- 2. <u>Title/Number/Revision</u> Test Plan for the Generic RIMS <u>B74 890818 501</u> Qualification of Series EA180 and EA740 Switches/ NAMCO Controls Test Plan No. QTP215/Revision 2 DATE <u>Feb. 18, 1987</u>

## OTHER (ANALYSIS, VENDOR DATA, ETC.)

- 3. TVA Environmental Drawing 47E235-41 R1 and DCA P-04104-01-0
- 4. TVA Environmental Drawing 47E235-42 R2 and DCA P-04104-02-0, -03-0, -02-1, -05-0
- 5. TVA Environmental Drawing 47E235-44 Rl
  - 6. TVA Environmental Drawing 47E235-45 Rl and DCA P-04104-06-0
  - 7. TVA Environmental Drawing 47E235-76 R3
  - 8. TVA Environmental Drawing 47E235-77 Rl
  - 9. TVA Environmental Drawing 47E235-78 R3
- 10. WBNTSR-051 RO (B26 891129 202), Reduction of Beta Dose by Sheet Steel.
- 11. WBNNAL3-031 R1 (B45 880826 235), EGTS Room 100 Day LOCA Dose.
- 12. WBNTSR-018 R0 (B26 891106 203), Dose Grid Around the EGTS Filter Train.
- 13. WBNTSR-O16 RO (B26 890703 552), Location Specific Radiation Doses to Limit Switches in EGTS Room A16 Elevation 757.

*All references herein are to NAMCO Report QTR 155 unless otherwise stated.

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WBEP-0272Q

PINDER NO WENFO_I7S_005 P	LANT WBN	UNIT(S) 1	SHEETOF
BINDER NO. <u>WDNHQ-125-005</u> 1			R R
BINDER TITLE EA 180 SERIES	COMPUTED_JD	4 DATE 4/	16/90
LIMIT SWITCHES MANUFACTURED	and and a contract		120 190
AFTER DECEMBER 1986	CHECKED	DATE //	

OTHER (ANALYSIS, VENDOR DATA, ETC.)

# CATEGORY AND OPERATING TIMES

- 14. System 3 (WBNOSG4-005 R10)
- 15. System 30 (WBNOSG4-008 R15)
- 16. System 31 (WBNOSG4-009 R7)
- 17. System 62 (WBNOSG4-013 R12)
- 18. System 63 (WBNOSG4-014 R11)
- 19. System 65 (WBNOSG4-015 R10)

20. Material Aging Calculation-WAC-258 304 392 +16190

TOH



NOTE: Documents listed above are used throughout this binder for equipment qualification. The revision levels and Records & Information Management System (RIMS) numbers, as listed above, need not be repeated in other sections of the binder. This listing includes only those documents which are essential to qualification and accordingly should not be considered a complete listing of binder references.

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WBEP-0272Q

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ATE <u>4/6/90</u>
ATE 4/20/90
1

B. <u>CONCLUSION OF REVIEW</u> (Check only one block)

<u>X</u> Equipment Qualified

Equipment Satisfies All Requirements Except Qualified Life or Justification of Replacement Schedule

_____ Equipment Qualification Not Established by Documentation

_____ Equipment Not Qualified Based on Test Failures

OPEN ITEMS AND QUALIFICATION DEFICIENCIES

# COMMENTS/RECOMMENDATIONS

DE PO THE DON'S REFERENCED IN THE REVISION LOG WERE REVIEWED TO DETERMINE 513 M LINAIT SWITCH ID, CATEGORY AND OPERATING TIMES, LOCATION, AND ELEVATION. 513 M



BINDER NO. WBNEQ-IZS-005 PLAN	NT WBN UNIT(S) 1 SHEET OF
BINDER TITLE EA 180 SERIES	COMPUTED DATE <u>4/8/40</u>
AFTER DECEMBER 1986	CHECKED WCN DATE 4/20/90

# C. QUALIFICATION CRITERIA

Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate Which Criteria is Applicable):

X Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE 323-1974).

_____ Components are Qualified to the Criteria of NUREG-0588 Category II

# JUSTIFICATION/COMMENTS

None

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE Standard 323-1974 IEEE Standard 344-1975 IEEE Standard 382-1972 (Pressurized Water Reactor portion only)







BINDER NO. WBNEQ-IZS-005 PLA	NT WBN	UNIT(S	5)1	SHEET	0F
			5477	R	R
BINDER TITLE EA 180 SERIES	_ COMPUTED_	JUH	DATE	<u> 7/0/40</u>	
AFTER DECEMBER 1986	_ CHECKED	west	DATE	4/20/90	

- D. <u>QUALIFICATION METHODOLOGY</u> (Check only one block)
  - X___ Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
  - X Test of Similar Items with Supporting Analysis
  - Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
  - Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis

### JUSTIFICATION/COMMENTS

This test provides generic group qualification for Model EA180 Series limit switches. The Model EA180-11302 selected for test purposes is identical to some of the equipment qualified by this binder. TAB C.2 contains a similarity evaluation which addresses the remainder of the equipment.







BINDER NO. WBNEQ-IZS-005 PLAN	T WBN UNI	IT(S) <u>1</u> SHEETOF_	
	. ·	R R	
BINDER TITLE EA 180 SERIES	COMPUTED_JDH_	DATE <u>4/6/90</u>	
LIMIT SWITCHES MANUFACTURED	CHECKED WCA	DATE 4/20/90	
ATTER DECEMBER 1900			

#### Ε. EQUIPMENT DESCRIPTION

Is the equipment identified in the qualification report identical to the plant equipment which requires qualification (yes/no/NA)? __Yes__

			Qualification	
		<u>Plant Device</u>	<u>Document</u>	<u>Reference</u> TAB D
1.	Equipment Type	<u>Limit Switches</u>	<u>Limit Switch</u>	<u>p. 3-1</u> TAB D
2.	Manufacturer	NAMCO Controls	NAMCO Controls	<u>p. 3-1</u> TAB D
3.	Model number(s)	See TAB A	EA180-11302	<u>p. 3–7</u>
				<u></u>
			<u></u>	
		<u></u>	- <u></u>	TAB D
4.	Serial Number(s)	See Comment	3179/383	<u>p_3-9,3-10</u>
	· ·			
				<u> </u>
	· ·		- <u></u>	
5.	Identify Component- Unique checksheet attached:	NA		

# JUSTIFICATION/COMMENTS

These limit switches do not have serial numbers but are provided with date codes per the manufacturer's date code system described on page 10-12 of the test report. (See TAB D.)

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DIANT UDNED T79 005 DIANT	TT WENT LINTT(S) 1 SHEET OF
BINDER NO. WDNEQ-123-005 IDANS	
	R R
BINDER TITLE EA 180 SERIES	COMPUTED JOH DATE $7/6/40$
	-
LIMIT SWITCHES MANUFACTURED	
AFTER DECEMPER 1096	CHECKED COP DATE 7/20/9
AFIER DECEMBER 1900	

#### F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the qualification documentation and/or evaluation and reference the source. Is the interface a requirement for our application (yes/no/NA)? (note below). If yes, enter requirement in QMDS; If No, provide justification.

		Plant	Pafarance
		Kequilement	Test Boport
<u>Interface</u>	<u>Identify Interface</u>	<u>(Yes/No)</u>	TAB D 4/24
Mounting Bolts	-See Comment (1)-	<u>¥es-</u>	- <u>p. 5-16-</u> west
External Process Connections	NA	<u>        No                            </u>	NA
Electrical Connections	NA	No	NA
			TAB D
Conduit Seals	See Comment (2)	Yes	<u>p. 4-5, 4-6</u>
Connector Seals	NA	No	NA
00020			
Orientation	NA	No	NA
Physical	NA	<u>No</u>	NA
configuration			TAB D
Other	See Comment (3)	Yes	

# JUSTIFICATION/COMMENTS

standard-side mounting, use two 5/16-18 bolts. For long or wide 100 (1) -mounting-use-four-1/4-20-bolts. All-bolts-must-be-grade-2-(minimum) -Torque-to-80-85 inch pounds (minimum) .---

For installation instructions refer to EA189 90008 on page 11-9 of The conduit entrance must be sealed in such a way as to maintain OTR155. the switch integrity under required service conditions (see TAB G).

2 (\$) Although it was not considered part of the qualification test, an operating lever is required for proper operation of the switch. The lever and roller shall be of metallic construction. Nylon rollers are not acceptable and are controlled through TVA's maintenance program (see TAB G).

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WBEP-0272Q



H24 JOH

BINDER NO. WBNEQ-IZS-005 PLAN	r wbn	UNIT(S	)1	SHEET	_0F
				R R	
BINDER TITLE EA 180 SERIES	COMPUTED_	<u>JDH</u>	DATE	4/6/90	
LIMIT SWITCHES MANUFACTURED <u>AFTER DECEMBER 1986</u>	CHECKED	west	DATE	4/20/90	

#### G. TEST SEQUENCE

1. Test Sequence: Was the test sequence established to simulate the accident environment in accordance with IEEE-323 (74), paragraph 6.3.2 (yes/no/NA)? (note below)

		<u>Yes/No/NA</u>	<u>Reference</u>
		~	TAB D -
a.	Equipment inspected for damage	Yes	pp. 3-5, 8-6
	-1		TAB D
ħ.	Baseline performance	Yes	p. 8-12
2.	measurements taken		
c.	Equipment aged:		
			TAB D
	Thermal	Yes	<u>pp. 6-2, 8-17</u>
			TAB D
	Radiation	Yes	<u>pp. 6-1, 8-31</u>
			TAB D
	Wear	Yes	6-1, 8-25
đ.	Vibration/seismic testing		TAB D
	conducted	Yes	p. 8-41
		<del></del>	
e.	Design basis event (DBE)		TAB D
	exposure	<u>Yes</u>	<u>p. 8-50</u>
			TAB D
f.	Post-DBE exposure	Yes	<u>p. 8-50</u>
		·	
g.	Final inspection and		TAB D
	disassembly	Yes	p. 8-64

- 3. Was the same piece of equipment used throughout the test sequence described in item 1 above (yes/no/NA)? Yes_
- 4. Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? __Yes, See Comment (Reference <u>OTR155, Sect. 8 & p. 15-8</u>).

JUSTIFICATION/COMMENTS

The test equipment documentation is provided on the "Instrumentation Equipment Sheets" located throughout Section 8 of QTR155.



BINDER NO. WBNEQ-IZS-005 PLAN	T WBN UNIT	(S) <u>1</u> SHEETOF
	,	R R
BINDER TITLE EA 180 SERIES	COMPUTED JDH	_ DATE <u>4/6/90</u>
LIMIT SWITCHES MANUFACTURED	1 . A A	HIA IA
AFTER DECEMBER 1986	CHECKED WCJI	_ DATE

# H. AGING

1. Was aging considered in the qualification program (Yes/no/NA)? <u>Yes</u> (Reference <u>TAB D. p. 6-1</u>).

# JUSTIFICATION/COMMENTS

None

2. Were the following effects considered in the aging program:

Aging Effect	<u>Yes/No/NA</u>	<u>Reference</u> TAB D
Thermal aging	Yes	<u>p. 6-2</u> TAB D
Radiation exposure	Yes	<u>p. 6-1</u> TAB D
Vibration (non-seismic) aging	Yes	<u>p. 6-1</u> TAB D
Operational (electrical/mechanical/process) stress aging	<u>Yes</u>	<u>p. 6-1</u>

JUSTIFICATION/COMMENTS

None

3. Were all known synergistic effects which are believed to have a significant effect on equipment performance considered in the aging program (yes/no/NA)? NA (Reference TAB D, p. 7-4).

JUSTIFICATION/COMMENTS

No known synergistic effects.

4. Thermal Aging:

a. Was thermal aging considered in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 6-2, 8-17</u>).

JUSTIFICATION/COMMENTS

None

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BINDER NO WENEO-IZS-005 PLAN	WBN UNIT(	S) 1	SHEETOF
			R R
BINDER TITLE EA 180 SERIES	COMPUTED JDH	DATE <u>4//</u>	16/90
LIMIT SWITCHES MANUFACTURED	And A	num 4/	a 1/90
AFTER DECEMBER 1986	CHECKED WCJ7	DATE <u>772</u>	

- H. <u>AGING</u> (Continued)
  - b. Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p, 6-7</u>).

JUSTIFICATION/COMMENTS

None

c. Was the basis for thermal aging identified in the qualification program. (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 6-4</u>).

# JUSTIFICATION/COMMENTS

None

d. Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 6-12</u>).

Parameter	<u>Plant Maximum Normal</u>	Test	<u>Equivalent</u>
Temperature	130°F (54.4°C)	<u>248°F</u>	<u>130°F (54.4°C)</u>
Time	40 years	<u>837 hrs</u>	10.8 years

# JUSTIFICATION/COMMENTS

The qualified life of all switches can be extended to 40 years through periodic refurbishment (See TAB G for refurbishment schedules).

e. Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 6-2</u>).

### JUSTIFICATION/COMMENTS

None

f. If activation energies were used for determining accelerated aging parameters, are they properly referenced to the source of the technical data (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, pp. 6-7, 6-8</u>).

JUSTIFICATION/COMMENTS

None

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BINDER NO. WBNEQ-IZS-005 PLAN	T WBN UNIT(	S)1	SHEET	0F
			R	R
BINDER TITLE EA 180 SERIES	COMPUTED JDH	DATE	4/6/90	
LIMIT SWITCHES MANUFACTURED AFTER DECEMBER 1986	CHECKED wer	DATE	4/20/90	

# H. <u>AGING</u> (Continued)

g. If a regression line was used for determining accelerated aging parameters, are test points or failure modes identified on the line (yes/no/NA)? <u>NA</u> (Reference <u>NA</u>).

### JUSTIFICATION/COMMENTS

None

h. Was the equipment operated during the thermal aging (yes/no/NA)? Yes (Reference TAB D, p. 8-17).

### JUSTIFICATION/COMMENTS

None

- 5. Radiation Aging Exposure:
  - a. Was radiation aging exposure considered in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 8-31</u>).

JUSTIFICATION/COMMENTS

None

b. Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D</u>, <u>p_6-7</u>).

# JUSTIFICATION/COMMENTS

Assembled test specimen irradiated to 220 Megarads.

c. Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 5-7</u>).

JUSTIFICATION/COMMENTS

None



BINDER NO. WBNEQ-IZS-005	PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET OF
BINDER TITLE EA 180 SERIES	COMPUTED_JDH DATE <u>4//6/90</u>
LIMIT SWITCHES MANUFACTURED	CHECKED WER DATE 4/20/90
	· · · · · · · · · · · · · · · · · · ·

#### AGING (Continued) H.

Is the radiation test exposure dose and dose rate acceptable d. (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, pp. 8-33, 8-34</u> ).

Plant normal ambient radiation dose (rd)	7 2.0 x 10 (worst case)
Test exposure dose (rd)	8 2.2 x 10
Test exposure dose rate (rd/hr)	5 7.73 x 10
Test exposure source type	

(e.g., Co-60 gamma)

Co-60 gamma

JUSTIFICATION/COMMENTS

None

- 6. Vibration (non-seismic) Aging:
  - Were the effects of non-seismic vibration induced during normal and a. abnormal operation addressed in the qualification program (1)? Yes (Reference TAB D, pp. 8-41, 8-42 ).

## JUSTIFICATION/COMMENTS

Plant induced vibration simulation 1 x  $10^6$  cycles @ 100 Hz and 0.75 g's per QTR155, pp. 8-41 and 8-42.

Was the basis for vibration aging identified and justified in the Ъ. qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D</u>, <u>pp. 5-9</u> ).

JUSTIFICATION/COMMENTS

None

- 7. Operational Stress Aging:
  - Were the effects of electrical, mechanical, and process operational a. stresses induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? Yes (Reference TAB D, pp 5-13 and 358-25). JOH 5/3/90 40 3990 JUSTIFICATION/COMMENTS

None

Qualification program refers to the test report and any supplemental (1)documentation including TVA analyses in TAB C of the binder.



BINDER NO. WBNEO-IZS-005 PLAN	r wbn UNIT(	S)	LSHEET	OF
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LIMIT SWITCHES MANUFACTURED	A.IC D		4/10/00	
AFTER DECEMBER 1986	CHECKED WW	DATE	11211-	

- H. <u>AGING</u> (Continued)
  - b. Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference TAB D, p. 8-3).

JUSTIFICATION/COMMENTS

See section P.1 for additional discussion.

8. Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes, See TAB C.4. (Reference <u>TAB D, p. 6-1</u>).

Qualified life (Document in QMDS): 40 years*

# JUSTIFICATION/COMMENTS

*Through periodic refurbishment as defined in TAB G.

Were replacement intervals for the equipment or its components defined 9. in the qualification program (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 6-11, 11-14</u>).

JUSTIFICATION/COMMENTS

None



BINDER NO. WBNEQ-IZS-005 PLAN	T WBN UNIT(	S)1	SHEET	OF
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# I. MATERIALS ANALYSIS

Identification of Materials Susceptible to Significant Thermal and/or Radiation Degradation and Aging (Use Section C of Binder for Detailed Materials Analysis)

	Material/Property/Function	Radiation <u>Threshold</u>	<u>Reference</u>	Activation Energy	<u>Reference</u>
	Synthetic Hydrocarbon				TAB D
a.	Grease/Lubricant	NA	NA ·	<u>1.19 eV</u>	<u>p. 6-7</u>
				1.14eV, See	TAB D
Ъ.	<u>Silicone Rubber/Gaskets</u>	<u>NA</u>	<u>NA</u>	<u>Comment</u>	<u>p. 6-7</u>
				.94eV, See	TAB D
c.	EPDM/O-Rings	<u>NA</u>	<u>NA</u>	<u>Comment</u>	<u>p. 6-7</u>
	Glass-filled Phenolic RX865	5		.827eV, See	TAB D
đ.	<u>Contact Carrier and Block</u>	<u>NA</u>	<u>NA</u>	Comment	<u>p. 6-7</u>
				.63eV, See	TAB D
e.	RTV/Thread Sealant	<u>NA</u>	<u>NA</u>	<u>Comment</u>	<u>p. 6-7</u>

JUSTIFICATION/COMMENTS

See the Materials Analysis discussion in TAB C.4 for justification of activation energies shown for listed materials.







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- EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE J. SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS
  - Acceptance Criteria: Does the report/analysis identify the limiting 1. values of performance characteristics which would constitute failure if not met (yes/no/NA)? Yes (Reference <u>QTP215, p. 7-1</u>).

Identify Acceptance Criteria: QTP215, p. 7-1

2. Performance Characteristics: Does the report/analysis provide the performance characteristics for the equipment which should be verified before, after, and periodically during the test to judge equipment performance (yes/no/NA)? Yes (Reference OTP215, p. 7-1 ).

-Identify baseline and functional testing: QTP215, p. 7-1

# JUSTIFICATION/COMMENTS

None

3. Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? <u>Yes</u> (Reference TAB D, p. 7-7 ).

JUSTIFICATION/COMMENTS

None





BINDER NO. WBNEQ-IZS-005 PLANT	r wbn UNIT(	S)1	SHEETOF
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- J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE</u> <u>SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS</u> (Continued)
  - Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 5-5, 5-6</u>).

JUSTIFICATION/COMMENTS

None

5. Identify electrical characteristics necessary to ensure the equipment performance specifications can be satisfied.

a.	Parameter	Plant Normal Condition	<u>Reference</u> Contract
	Voltage	<u>125_VDC</u> (1)	( <u>See TAB E)</u> Contract
	Load	(1) <u>5 Amps</u>	( <u>See TAB E</u> )
	Frequency	<u>NA</u>	NA
	Accuracy	NA	<u>NA</u>
	<u>Other(s)</u>		
		NA	<u>NA</u>
	· ·	<u>NA</u>	NA

# JUSTIFICATION/COMMENTS

See comment (1) at end of section.



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BINDER NO, WBNEQ-IZS-005 PLAN	T WBN UNIT(	S) <u>1</u>	SHEET	0F
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- J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE</u> <u>SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS</u> (Continued)
  - 5. (Continued)

5.

b. <u>Paramet</u>	ter <u>Specific Accident Conditions</u>	<u>s Reference</u>
Voltage	125 VDC ⁽¹⁾	<u>(See TAB E)</u>
Load	(1) <u>5 Amps</u>	<u>(See TAB_E)</u>
Frequenc	су <u>NA</u>	NA
Accuracy	NA	NA
Other(s)	)	
	NA	NA
	<u>NA</u>	

# JUSTIFICATION/COMMENTS

See comment (1) at end of section.



BINDER NO. WBNEO-IZS-005 PLANT	WBN UNIT(S	S) <u>1</u> SHEETOF
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- J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE</u> <u>SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS</u> (Continued)
  - 5. (Continued)

c. <u>Parameter</u>	Demonstrated Conditions	Reference
Voltage	(2) 125 VDC	TAB D p. 5-6 TAB D
Load	(2) 0.5A	<u>p. 5-6</u>
Frequency	NA	NA
Accuracy	<u>NA</u>	NA
Other(s)		
Insulation Resistance <u>(Minimum)</u>	(3) 280 Megohms	TAB D 7-3
Circuit Opening/ Contact Bounce (During Seismic/ Vibration Test)	See Comment (4)	TAB D 77-2

# JUSTIFICATION/COMMENTS

(1) The typical application of these limit switches is in control circuits. for example solenoid valves. The U.L. and nameplate id 5 is under

1. THE TYPICAL APPLICATION OF THESE LIMIT SWITCHES IS WITHE (2 CONTROL CIRCUITS OF, FOR GRAMPLE, SUCENOID SPORATED VALVES

1/oxide

and therefore, provide little contact surface renewal.

(b) When switches are operated at rated voltage and current, the contact surfaces tend to be self-cleaning and/or the potential of the circuit is sufficient to break down films or oxides that might form on the contact faces.



BINDER NO. WBNEQ-IZS-005 PLAN	T <u>WBN</u> UNI	T(S) 1 SHEET	0F
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LIMIT SWITCHES MANUFACTURED AFTER DECEMBER 1986	CHECKED WCM	DATE 4/20/90	

- J. <u>EQUIPMENT ELECTRICAL CHARACTERISTICS NECESSARY TO ENSURE THE PERFORMANCE</u> <u>SPECIFICATIONS CAN BE SATISFIED UNDER ACCIDENT CONDITIONS</u> (Continued)
  - 5. (Continued)

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- (c) Since TVA's standard design practices prevent circuits from exceeding the U.L. ratings of contacts, the 100VDC and 0.086 Amp load used for testing is conservative and adequate considering items a and b above.
- (3) At the demonstrated insulation resistance value of 280 Megohms, there would be a slight leakage current of approximately 0.446 microamps for a typical 125V circuit. This small leakage current should not provide enough amperage to cause any adverse circuit operation.
- (4) While there are no plant specific requirements with regard to contact bounce/circuit opening, it was demonstrated that none occurred during seismic and vibration testing of the limit switch.

В	INDE	R NO.	WBNEQ-IZS-005	PLANT WBN	UNIT(S)1 SHEETOF RR
	INDE IMIT <u>FTER</u>	R TIT SWIT DECE	LE <u>EA 180 SERIES</u> CHES MANUFACTURED MBER 1986	COMPUTED	$\frac{JDH}{DATE} \frac{4/16/90}{1/20/90} $
 к.1	REQ	UIRED	OPERATING ENVIRO	NMENT	
	<u>Ref</u>	erenc	<u>e Environmental D</u>	<u>rawing No.</u> 4	7E235-41 (Upper Compartment)
	1.	Norn	nal Max	2	. Abnormal Max
		a.	Temperature (°F)	110	a. Temperature (°F) <u>120</u>
·		b.	Pressure (psig)	0.3	b. Pressure (psig) <u>0.3</u>
		c.	Humidity (%)	80	c. Humidity (%) <u>90</u> .
		d.	Radiation (rd)	<u>1 x 10</u>	d. Radiation (rd) <u>NA</u>
	3.	Proc	ess Interfaces:	None	·
	4.	Stat cond	e anticipated occ	urrence frequ	ency and duration of abnormal
		Abno and <del>life</del> WBNE	ormal conditions c will occur less t <del>- is negligible.</del> ( EQ-GEN-001).	ould exist fo han 1% of the See generic p	or up to eight hours per excursion e plant life. <del>(Effect on qualified</del> ۴/۲۹۹ osition in Binder No. 4/25/19
	5.	Acci para	ident (worst case meter including p	for any combine ak, duration	nation of specified accident , and profile):
		a.	Temperature (°F)	161	Accident type <u>LOCA/HELB</u>
		b.	Pressure (psig)	11.2	Accident type <u>LOCA/HELB</u>
		· C .	Humidity (%)	$\frac{100}{44.7 \times 10^8 \text{be}}$	Accident type <u>LOCA/HELB</u>
		d.	Radiation (rd)	<u>3.8x 10</u> ⁷ gamm	a Accident type <u>LOCA</u>
		e.	Spray Type	**	Accident type <u>LOCA/HELB</u>
*	Ref rad	er to liatio	o TAB C.6 for just on.	ification reg	arding acceptability of beta
**	0.1	9 mol	ar HaBOa (2000 PP	M Boron) 0 0	33 molar NaOH regulting in a pH

** 0.19 molar H₃BO₃ (2000 PPM Boron), 0.033 molar NaOH resulting in a pH of 8.3 at 25°C. Spray duration is 30 days, at a flow rate equal to 0.92 GPM per square foot of containment cross section.



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K.2 <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

Reference Environmental Drawing No. 47E235-42 (Lower Compartment)

- 1. Normal Max 2. Abnormal Max
  - Temperature (°F) <u>130</u> Temperature (°F) <u>120</u> a. a. Pressure (psig) 0.3 b. Pressure (psig) ______ b. Humidity (%) 80 c. Humidity (%) 100 c. 7 Radiation (rd) NA Radiation (rd) 2x10 d. d.
- 3. Process Interfaces: None.
- 4. State anticipated occurrence frequency and duration of abnormal conditions: Abnormal conditions could exist for up to eight hours per excursion and will occur less than 1% of the plant life. -(Effect on 40 to 10 to 1
- 5. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

a.	Temperature (°F)	327	Accident Type <u>LOCA/HELB</u>
b.	Pressure (psig)	11.2	Accident Type <u>LOCA/HELB</u>
c.	Humidity (%)	100	Accident Type <u>LOCA/HELB</u>
đ.	Radiation (rd)	*4.7 x 10 ⁸ beta <u>4 x 10</u> ⁷ gamma	Accident Type <u>LOCA</u>
e.	Spray Type	Acc	ident Type <u>LOCA/HELB</u>

* Refer to TAB C.6 for justification regarding acceptability of beta radiation.

** 0.19 molar H₃BO₃ (2000 PPM Boron), 0.033 molar NaOH resulting in a pH of 8.3 at 25°C. Spray duration is 30 days, at a flow rate equal to 0.92 GPM per square foot of containment cross section.



BINDER NO. WBNEQ-IZS-005 PLA	NT WBN UNIT(	S) <u>1</u> SHEETOF
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K.3 <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

Reference Environmental Drawing No. 47E235-44 (Annulus)

1. Normal Max

d.

2. Abnormal Max

- Temperature (°F) <u>120</u> a. Temperature (°F) <u>110</u> a. Pressure (psig)  $\underline{ATM}(-)$ b. Pressure (psig) <u>ATM(-)</u> Ъ. c. Humidity (%) 90 80 Humidity (%) c. 6 d. Radiation (rd) NA <u>1x10</u> Radiation (rd)
- 3. Process Interfaces: None.
  - 4. State anticipated occurrence frequency and duration of abnormal conditions: Abnormal conditions could exist for up to eight hours per excursion and will occur less than 1% of the plant life. - (Effect on--qualified life is negligible. (See generic position in Binder No. WBNEQ-GEN-001.)
- 5. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

a.	Temperature (°F)	133.7	Accident Type	LOCA/HELB
b.	Pressure (psig)	<u>ATM(-)</u>	Accident Type	LOCA/HELB
<b>c.</b> .	Humidity (%)	<u>61</u>	Accident Type	LOCA/HELB
d.	Radiation (rd)	$\frac{-6 \times 10^5 \text{ beta}}{10^6 \times 10^7 \text{ beta}}$	Accident Type	LOCA
e.	۶pray Type	<u>NA</u> Acc	ident Type	NA

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* THIS DOSE INCLUDES A BETA CONTRIBUTION OF 6X10 S RADS.





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.4	<u>req</u>	<u>UIRED OPERATING ENVIRONMENT</u> (Continued)
	<u>Ref</u>	erence Environmental Drawing No.: 47E235-45 (Instrument Room)
	1.	Normal Max 2. Abnormal Max
3		a. Temperature (°F) <u>75</u> a. Temperature (°F) <u>120</u>
		b. Pressure (psig) 0.3 b. Pressure (psig) 0.3
		c. Humidity (%) <u>60</u> c. Humidity (%) <u>90</u>
		d. Radiation (rd) <u>3.5x10</u> d. Radiation (rd) <u>NA</u>
	3.	Process Interfaces: None
	4.	State anticipated occurrence frequency and duration of abnormal conditions: Abnormal conditions could exist for up to eight hours per excursion and will occur less than 1 percent of the plant life. <u>(Effect</u> -on qualified life is negligible. (See generic position in binder No. WBNEQ-GEN-001).
		Accident (worst case for any combination of specified accident
	5.	parameter including peak, duration, and profile):
	5.	parameter including peak, duration, and profile): a. Temperature (°F) <u>327</u> Accident type <u>LOCA/HELB</u>
	5.	parameter including peak, duration, and profile):         a. Temperature (°F) 327       Accident type LOCA/HELB         b. Pressure (psig) 11.2       Accident type LOCA/HELB
	5.	parameter including peak, duration, and profile):         a. Temperature (°F) 327       Accident type LOCA/HELB         b. Pressure (psig) 11.2       Accident type LOCA/HELB         c. Humidity (%) 100       Accident type LOCA/HELB
	5 <b>.</b> .	parameter including peak, duration, and profile):a. Temperature (°F) 327Accident type LOCA/HELBb. Pressure (psig) 11.2Accident type LOCA/HELBc. Humidity (%) 100 *4.7 x 10 ⁸ betaAccident type LOCA/HELBd. Radiation (rd) 1.0 x 10 ⁷ gamma Accident type LOCA

** 0.19 molar H₃BO₃ (2000 PPM Boron), 0.033 molar NaOH resulting in a pH of
 8.3 at 25°C. Spray duration is 30 days, at a flow rate equal to 0.92 GPM per square foot of containment cross section.



BINDER NO. WBNEQ-IZS-005 PLA	ANT WBN	UNIT(S)	1 SHEET	0F
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# K.5 <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

<u>Ref</u>	erenc	<u>ce Environmental l</u>	<u>Drawing No.</u> :	47E2: Valve	35-76 (North and S e Rooms)	South
1.	Norn	nal Max		2. Abı	normal Max	
	a.	Temperature (°F)	130	a.	Temperature (°F)	<u>140 .</u>
	Ъ.	Pressure (psig)	<u>ATM(-)</u>	b.	Pressure (psig)	ATM
	c.	Humidity (%)	50	c.	Humidity (%)	100
	d.	Radiation (rd)	3 1.8x10	đ.	Radiation (rd)	NA

- 3. Process Interfaces: None
- 4. State anticipated occurrence frequency and duration of abnormal conditions: Abnormal conditions could exist for up to eight hours per duration excursion and will occur less than 1 percent of the plant life. <u>(Effect and Con-qualified-life-is-negligible.</u> (See generic position in binder No. <u>WBNEQ-GEN-001</u>).
- 5. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

a.	Temperature (°F)	325 north 323 south 8 77 north	Accident type <u>FW</u>
b.	Pressure (psig)	10.78 south	Accident type <u>FW</u>
c.	Humidity (%)	100	Accident typeFW
đ.	Radiation (rd)	<u>&lt;1 x 10</u> ⁴	Accident type <u>LOCA</u>
e.	Spray Type	NA	Accident type <u>NA</u>



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AFTER DECEMBER 1986	CHECKED	west	DATE	4/20/90		
				<u></u>		
C.6 <u>REQUIRED OPERATING ENVIRONME</u>	<u>NT</u> : (Con	tinued)				
Reference Environmental Draw	ing No.:	47E235-7	7 (RHH	R Valve	Rooms	)

1.	Normal Max			2. Abnormal Max			
	a.	Temperature (°F)	104	a.	Temperature (°F)	110	
	Ъ.	Pressure (psig)	ATM	b.	Pressure (psig)	ATM	
	c.	Humidity (%)	80	c.	Humidity (%)	90	
	d.	Radiation (rd)	6 1.8x10	d.	Radiation (rd)	NA	

3. Process Interfaces: None

- 4. State anticipated occurrence frequency and duration of abnormal conditions: Abnormal conditions could exist for up to eight hours per up to excursion and will occur less than 1 percent of the plant life. (Effect 10) on qualified life is negligible. (See generic position in binder No. 4/1/2) WBNEQ-GEN-001).
- 5. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

a.	Temperature (°F)	190	Accident type <u>LOCA</u>
Ъ.	Pressure (psig)	ATM	Accident type <u>LOCA</u>
c.	Humidity (%)	90	Accident type <u>LOCA</u>
đ.	Radiation (rd)	<u>1 x 10</u> 7	Accident type <u>LOCA</u>
e.	Spray Type	_NA	Accident type <u>NA</u>





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K.7 <u>REQUIRED OPERATING ENVIRONMENT</u> (Continued)

<u>Ref</u>	eren	<u>ce Environmental  </u>	Drawing No.:	47E2	35-78 (EGTS Room)		
1.	Normal Max			2. Abnormal Max			
	a.	Temperature (°F)	<u>104</u>	a.	Temperature (°F)	110	
	b.	Pressure (psig)	ATM	b.	Pressure (psig)	ATM	
	c.	Humidity (%)	80	c.	Humidity (%)	90	
	d.	Radiation (rd)	3 1.8x10	d.	Radiation (rd)	<u>NA</u>	

- 3. Process Interfaces: None
- 4. State anticipated occurrence frequency and duration of abnormal conditions: Maximum and minimum abnormal temperatures could exist for up to eight hours per excursion and will occur less than 1 percent of the plant life. Maximum abnormal temperatures could exist for up to 10 hours "per month during" 4 months of the year because of the EGTS units being operated for testing and maintenance.
- 5. Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

a.	Temperature (°F)	110	Accident	type LOCA
Ъ.	Pressure (psig)	_NA	Accident	type <u>NA</u>
c.	Humidity (%)	NA	Accident	type <u>NA</u>
d.	Radiation (rd)	<u>1.06 x 10</u> 7 <u>*</u>	Accident	type <u>LOCA</u>
e.	Spray Type	NA	Accident	type <u>NA</u>

*Worst case per WBNTSR-016 calculation.


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K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

For a cross-reference of equipment to environmental drawing, see TAB G.

- 6. Is the equipment subject to moisture or liquid intrusion which can affect the performance of the equipment under design basis accident conditions (yes/no/NA)? Yes (Reference TAB-G, 47E235-41, -42, -45, and -76). SECTION P(3) TOW 5/3/190 cf.
- 7. Subject to submergence (yes/no/NA)? <u>No</u> 5/3/40° (Reference _____).

Identify initiation time and duration of submergence:

8. Is the equipment subject to a beta radiation contribution to the total accident dose (yes/no/NA)? Yes (Reference 47E235-41, -42, -45.)

If yes, identify the fraction of the unattenuated free field beta dose to be added to the total dose and justify: <u>See TAB C-6</u>.

9. Special environmental calculations (temp., rad., etc.)

<u> Type</u>

<u>RIMS No</u>.

See TAB B, Section A

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#### SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS L.

1. Comparison of worst-case maximum parameters:

	Parameter	<u>Specified</u>	Demonstrated	Reference
	Operating Time	<u>100 days</u>	30 days	$\frac{p. 8-53}{TAB D}$
	Temperature (°F)	327	342***	p. 8-54
	Pressure (psig)		76.4	TAB D, <u>p. 7-6</u> TAB D
	Relative Humidity (%)	100	100	<u>p. 7-6</u>
*	Chemical Spray	<u>TAB C.1</u> 1.11x10 ⁸ gamma	TAB C.1 2.2x10 ⁸	TAB D, <u>p. 7-7</u> TAB D,
**	Radiation (rd)	<u>plus beta</u>	gamma	<u>p. 7-6</u>
	Submergence	NA	NA	NA

* Includes spray concentration, flowrate, density, duration, and pH.

** Enter 40-year integrated normal dose plus integrated accident dose and specify type. Refer to TAB C.6 for beta dose contribution. *** See TAB B, Section P.2

2. Comparison of worst-case profiles and margin assessment:

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Iemperature	Yes	<u>See L(1)</u>
Pressure	Yes	<u>See L(1)</u>
Relative Humidity	Yes	<u>See L(1)</u>
Chemical Spray	Yes	TAB C-1
Submergence	NA	NA

JUSTIFICATION/COMMENTS

See TAB C-3 for demonstration of 100 day operability (Accident Degradation Equivalency Calculation).

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WBEP-0272Q



BINDER NO. WBNEQ-IZS-005 PLAN	T WBN UNIT(	S) <u>1</u> SHEET OF
BINDER TITLE EA 180 SERIES	COMPUTED JDH	R R DATE #16/90
LIMIT SWITCHES MANUFACTURED		
AFTER DECEMBER 1986	CHECKED WCJI	DATE <u>71249</u>

#### L. <u>SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS</u> (Continued)

3. Were margins applied to the test parameters or otherwise addressed in the test program to assure that normal variation and uncertainties are accounted for: (Note margin applied, yes/no/NA)

Manain

Suggested Margins per IEEE-323(74)	Applied	<u>Yes/No/NA</u>
Temperature: +15 degrees F	<u>15°F</u>	Yes
Pressure: +10% but no more than 10 psig		Yes
Radiation: +10% of accident dose	10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	<u>TAB C-3</u>	TAB C-3
Voltage: <u>+</u> 10% of rated value	<u>NA</u>	NA
Frequency: <u>+</u> 5% of rated value	<u>NA</u>	NA
Environmental Transient: the initial transient and the peak temperature applied twice	<u>2 Dwells</u>	<u>Yes</u>
Wibmotions 10% odded to coolematic	10%	<b>17</b>
VIDIALION: +10% added to acceleration	see comments	res

### JUSTIFICATION/COMMENTS

Per TVA Standard Specification SS-E18.12.01, Seismic Requirements for Category I Electrical and I&C Equipment, these limit switches should be tested to 3 g's horizontal and 2 g's vertical. Since NAMCO verified in their report (TAB D, p. 5-9 and 5-10) that cross coupling was not significant, the single axis test performed in each of the 3 axes to 10 g's was more than adequate.



BINDER NO. WBNEQ-IZS-005 PLANT	WBN UNIT(S) 1	SHEETOF
		R R
BINDER TITLE EA 180 SERIES CON	IPUTED_JDH DATE	4/6/90
LIMIT SWITCHES MANUFACTURED		
AFTER DECEMBER 1986 CHI	CKED WEST DATE	1120190

#### M. OPERABILITY TEST RESULTS

JUSTIFICATION/COMMENTS

None

2. Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p. 7-1</u>).

JUSTIFICATION/COMMENTS

None

3. Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? <u>Yes</u> (Reference <u>TAB</u> <u>D, p. 7-1</u>).

JUSTIFICATION/COMMENTS

None

4. Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? Yes (Reference TAB D, p. 7-7).

JUSTIFICATION/COMMENTS

See TAB C.3 for discussion

5. Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? <u>Yes</u> (Reference <u>TAB D, p.</u> <u>8-52</u>).

JUSTIFICATION/COMMENTS

None



ſ	BINDER NO. WBNEQ-IZS-005 PLANT WBN UNIT(S) 1 SHEET OF
	R R
	BINDER TITLE EA 180 SERIES COMPUTED JDH DATE 4/6/90
	AFTER DECEMBER 1986 CHECKED WCF DATE 4/20/90

#### N. MAINTENANCE AND SURVEILLANCE

Has the qualification program identified those surveillance, maintenance, and inspection parameters which are essential to maintain qualification and which aid in detecting degrading materials or equipment performance (yes/no/NA)? <u>Yes</u> (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS

See QMDS-TAB G





ĺ	BINDER NO. WBNEQ-IZS-005 PLANT WBN UNIT(S) 1 SHEET OF
	BINDER TITLE EA 180 SERIES COMPUTED JDH DATE 4/6/90
+	AFTER DECEMBER 1986 CHECKED WCN DATE 4/20/90

# 0. <u>SUMMARY OF REVIEW</u>

<u>Yes/No/NA</u>

1.	Docu (Hav all anal	mented evidence of qualification adequate re all assumptions, mathematical models, and extrapolations of test data used in an ysis been justified and documented)?	<u>    Yes</u>
2.	Any take adeq	exceptions (i.e., sound reasons to the contrary) on to the specified qualification level quately justified?	NA
3.	Choi just	ce of qualification methodology adequately ified?	<u>    Yes    </u>
4.	If a	nalysis was performed, complete the following:	
	a.	Were equipment performance requirements identified?	<u>NA</u>
	Ъ.	Were specific features and failure modes and effects analyzed?	NA
	C.	Were assumptions and mathematical models used together with appropriate justification for their use?	<u>NA</u>
	đ.	Were environmental parameters which affect equipment performance identified?	NA
5.	Adeo spec	uate similarity between equipment and test timen established?	Yes
6.	Agir	ng degradation evaluated adequately?	<u>Yes</u>
	a.	Mechanical and/or cycle aging addressed?	Yes
	b.	Equipment aged to end of life condition prior to application of DBE conditions?	Yes
	c.	Absence of preaging in test/analysis justified?	NA
	d.	Materials susceptible to thermal/radiation aging identified?	Yes

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WBEP-0272Q

BINDER NO. WBNEO-IZS-005 PL	ANT WBN UNIT(S) 1 SHEET	OF
EINDED TITLE EN 180 SEDIES	$\frac{R}{R}$	R
LIMIT SWITCHES MANUFACTURED	COMPUTED DATE	· .
AFTER DECEMBER 1986	CHECKED DATE	
0. <u>SUMMARY OF REVIEW</u> (Continue	ed)	<u>Yes/No/NA</u>
e. Normally operatin (e.g., normally e	ng state of device energized) considered?	<u>Yes</u>
7. Qualified life or re	eplacement schedule established?	Yes
8. Criteria regarding t satisfied?	emperature/pressure exposure	Yes
a. Peak temperatur	ce adequate	Yes
b. Peak pressure a	adequate	<u>    Yes</u>
c. Duration adequa	ate	<u>Yes</u>
d. Required profil	le enveloped adequately	Yes
e. Steam exposure	adequate	Yes
9. Criteria regarding t	test sequence satisfied?	Yes
10. Criteria regarding spr	ray satisfied?	Yes
a. Was the spray tes extremes of press	sting done while under the sure and temperature?	<u>Yes</u>
b. Does the spray co duration, and pH those to be used	oncentration, flow rate, density, used in tests meet or exceed for the plant?	Yes
ll. Criteria regarding sub	bmergence satisfied?	Yes
12. Criteria regarding rad	diation satisfied?	Yes
a. Was dose rate con	nsidered?	<u>Yes</u>
b. Was beta radiatio	on considered?	Yes
13. Criteria regarding ope	erability status/mode satisfied?	Yes
14. Criteria regarding tes	st failures or anomalies	<u>    Yes</u>

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BINDER NO. WBNEQ-IZS-005 PLAN	r wbn UNIT(S	5) <u>1</u> SHEETOF
		R R
BINDER TITLE EA 180 SERIES	COMPUTED JDH	DATE <u>4/6/90</u>
LIMIT SWITCHES MANUFACTURED		1110.10
AFTER DECEMBER 1986	CHECKED ACT	DATE 9/20/98

0. <u>SUMMARY OF REVIEW</u> (Continued)

		<u>Yes/No/NA</u>
15.	Criteria regarding functional testing satisfied?	Yes
•	a. Does the test plan/report specify an acceptance criteria for equipment performed?	<u>Yes</u>
	b. Was an initial base line test done to establish required performance characteristics?	<u> Yes</u>
	c. Has the test/analysis demonstrated that performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	<u>Yes</u>
16.	Criteria regarding instrument accuracy satisfied?	<u>NA</u>
17.	Test duration margin (1 hour + function time) satisfied?	Yes
	a. Is the minimum specified operating time at least 1 hour?	Yes
	b. If exception to the 1-hour minimum operating time was taken, was adequate justification provided?	NA
18.	Criteria regarding synergistic effects satisfied?	Yes
19.	Criteria regarding margins satisfied?	Yes
20.	Maintenance and surveillance requirements adequately identified?	Yes

P. <u>DISCUSSION</u>

(1) AGING - Section H.7.b - This device was subject to 100,300 actuation cycles during mechanical aging testing. This is equivalent to an average of 209 actuations per month or approximately 7 actuations per day over the 40 year life of the plant. This is judged to be in excess of the full open/close actuation cycles the associated valves will be required to operate for normal plant operation, maintenance, and surveillance. Therefore, the mechanical aging performed is adequate to demonstrate qualification over the 40 year life of the plant.



BINDER NO. WBNEQ-IZS-005 PLANT	WBN UNIT(S)	1 SHEET OF
		R R
BINDER TITLE EA 180 SERIES CO	MPUTED JOH DAT	E <u>#/16/90</u>
LIMIT SWITCHES MANUFACTURED		
AFTER DECEMBER 1986 CH	IECKED WCA DAT	E <u>4120198</u>

#### P. <u>DISCUSSION</u> (Continued)

- (2) SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS -Section L.1 - QTR 155 states that the peak temperature in the test chamber was 361°F (p. 7-6). Two thermocouples were used to measure temperatures during the test. The 361°F was measured by the thermocouple, TC-13, that was closest to the steam inlet (p. 8-61). For qualification purposes, this binder has used the more conservative temperatures measured by thermocouple TC-06.
- (3) REQUIRED OPERATING ENVIRONMENT SECTION K.G SEE PAGES G-2 THRU G-G.
   FOR LIST OF LIMIT SWITCHES WHICH REQUIRE CONDUIT SEALS DUE TO
   MOISTURE INTRUSION.





TROW OOL PLANT WEN UNIT(S) 1 SHEET 1 OF 1 R 1 R 4	-
BINDER NO.       WBNEQ-JBOX-001       TELES       DATE       6/16/86       CAG       wc.57         DER TITLE       JUNCTION BOXES       COMPUTED       JLH       DATE       6/16/86       CAG       wc.57         DER TITLE       JUNCTION BOXES       COMPUTED       JLH       DATE       6/16/86       JAW       CAL         CHECKED       ETD       DATE       6/16/86       JAW       CAL	
TAB A COMPLILATION METHODOLOGY	7
<ol> <li>The Watts Bar Environmental Qualification binder WBNEQ-JBOX-001 equipment list (TAB A) was compiled by utilizing the DNE calculation WBPEVAR 8601003 as a baseline reference document. This calculation listed all of the Class LE junction boxes and local instrumentation panels in the harsh environment. All end devices (devices whose circuits terminate in the junction box) were listed for each JB. A crosscheck of the end devices in each JB was made to the category and operating times calcula- tions and, if any device was determined to be category A or B for any event, the JB was entered into the binder TAB A.</li> <li>This process was performed for each revision and QIR to the WBPEVAR 8601003 calculation to ensure a comprehensive assessment of all Class LE harsh environment JBs.</li> <li>WBPEVAR 3601003 R4 dated 5/26/88 is superceded by the Environ- mental Qualification (EQ) Binders.</li> <li>Elevations shown are actual elevations for equipment located in the reactor building and floor elevations for equipment all equipment are documented in TAB F.</li> <li>Junction Box number 1-JB-292-3870 contains a MOS varistor. For discussion of this, see TAB C, page C-4.</li> </ol>	R4
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PAGE A-1 R4	

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#### NATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. AZMITH. MODEL NUMBER	LOCATI ELEV CONTI	ION- (1) RACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	<u>EVENT</u>	SAFETY FUNCTION	
WBN-1-JB -276-L182A Loc PNL JUNCTION BOX	– D	1-JB	-276-L182A -D 183 BY PNL MFR	721'	6 n	FN2	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -276-L182B Loc PNL JUNCTION BOX	-D	_ <b>1-</b> JB	-276-L182B -D 181 By PNL MFR	721'	6 #	FN2	B	100D	ALL	COMPONENT PROTECTION	
NBN-1-JB -276-L183A Loc PNL Junction Box	-E	1-JB	-276-L183A -E 005 By PNL MFR	721'	6 77	FN1	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -276-L183B LOC PNL JUNCTION BOX	-E	1-JB	-276-L183B -E 002 By PNL MFR	721'	611	FN1	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -276-L183C LOC PNL JUNCTION BOX	- B	1-JB	-276-L183C -B 359 BY PNL MFR	721'	611	FN1	B	100D	ALL	COMPONENT PROTECTION	

PAGE  $|\mathcal{P}|$ 1 N 25

•	R_2_	R <u>3</u>	R
PREPARER/DATE JLH 9-8-86 CHECKED/DATE ETD 9-10-86	<u>CAG</u> 9-10-89 WCG 9-15-89	NOP 2-22-90 10-4 2-13-90	

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### HATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

				DEVICE TO NO		LOCATION-	RM/RAD	CAT	OPER TIME	EVENT	SAFETY FUN	ICTION
EQIS NUME DESCRIPTI	ON			MODEL	NUMBER	<u>CONTRACT</u>		(2)	<u></u>			
WBN-1-JB Loc Pnl J	-276-L196 UNCTION BOX	- D	1-JB	-276-L196 By PNL	-D MFR	713'	A06	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB Loc Pnl J	-276-L197 UNCTION BOX	-E	1-JB	-276-L197 By PNL	-E MFR	713'	A06	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB Loc PNL J	-276-L216 UNCTION BOX	-A	1-JB	-276-L216 By PNL	−A MFR	713'	A06	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB Loc Pnl J	-276-L217 UNCTION BOX	-A	1-JB	-276-L217 By PNL	-A . MFR	737'	A05	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB JUNCTION	-292-0004 BOX	-A	1-JB	-292-0004 JXA	-A	737' Various	A01	B.	100D	ALL	COMPONENT	PROTECTION

PAGE  $\mathcal{P}$ W NS S

			R_2_	R <u>3</u>	R
PREPARER/DATE_	JLH	9-8-86	CHG	wen	<u></u>
CHECKED/DATE	ETD	9-10-86	4 20.89 <u>WCG</u>	<u>LII-43</u>	
			9-25-89	2.23.90	

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BINDER NO. : WBNEQ-JBOX-MANUFACTURER : VARIOUS PAGE 3 OF 51

EQIS NUMB	ER		UNIT	DEVICE ID NO	<u>).</u>	AZMITHLOCATI	ON <u>1)</u> <u>RM/RAD</u>	ÇAI	OPER TIME	<u>event</u>	SAFETY FU	ICTION
DESCRIPTI	ON			<u>M</u>	DDEL NUMB	ER <u>CONTR</u>	<u>ACT</u>	(2)				
WBN-2-JB Junction	-292-0006 Box	- B	2-JB	-292-0006 J)	-B KA	737' Vario	AO1 US	B	100D	ALL	COMPONENT	PROTECTION
WBN-O-JB Junction	-292-0228 BQX	-A	0-JB	-292-022 <b>8</b> J(	-A Re	729 <b>'</b> Vario	A06 US	B	100D	ALL	COMPONENT	PROTECTION
WBN-O-JB Junction	-292-0229 BOX	- B	0-JB	-292-0229 JI	-B Qe	729' Vario	A06 US	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB JUNCTION	-292-0358 BOX	- B	1-JB	-292-0358 J	-B XA	692 Vario	A12 US	B	100D ·	ALL	COMPONENT	PROTECTION
WBN-1-JB Junction	-292-0359 Box	-B	1-JB	-292-0359 J	-B XA	692 <b>'</b> Vario	A13 US	B	100D	ALL .	COMPONENT	PROTECTION

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			R_ <u>2_</u>	R_ <u>3</u> _	R
PREPARER/DATE_	JLH	9-8-86	CAG	an con	
CHECKED/DATE	ETD	9-10-86	9-20-89 WCG	2-22-90	
		F	9-25-89	2.2390	







		<u>UNIT</u>	DEVICE ID NO.		LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	$\frac{CAI}{(2)}$	OPER TIME	<u>event</u>	SAFETY FUNCTION	
WBN-1-JB -292-0530 JUNCTION BOX	-B	1-JB	-292-0530 JVF	-B	729' VARIOUS	A01	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB ~292-0540 Junction Box	-A	1-JB	-292-0540 JVE	-A	729' VARIOUS	<b>A01</b>	B	. 100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-0567 Junction Box	-A	1-JB	-292-0567 JFD	-A	676 <b>'</b> Various	A16	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-0569 Junction Box	<b>- B</b>	1-JB	-292-0569 JFD	- B	676' Various	A16	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-0593 Junction Box	-A	1-JB	-292-0593 JQE	-A	737 <b>'</b> Varidus	A05	B	100D	ALL	COMPONENT PROTECTION	

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PREPARER/DATE_	JLH	9-8-86	CAG	wer	
CHECKED/DATE	ETD	9-10-86	9-20-89 20-6	2.22.90	
• –			9-25-89	2.3.90	





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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

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EQIS_NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MOD	AZMIIH El NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	<u>OPER TIME</u>	<u>EVENI</u>	SAFETY FUN	CTION	
WBN-1-JB -292-0748 - Junction Box	B	1-JB	-292-0748 JXA	- B	713' VARIDUS	A28	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -292-0772 - Junction Box	- B	1-JB	-292-0772 JFD	- B	676' Various	A16	B	100D	ALL	COMPONENT	PROTECTION	
NBN-1-JB -292-0773 · Junction Box	-A	1-JB	292-0773 JXA	-A	676' Various	A16	B	100D	ALL	COMPONENT	PROTECTION	• ;
WBN-1-JB -292-0846 Junction Box	- B	Į−JB	-292-0846 JV(	-B C	692' VARIOUS	A06	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -292-0847 JUNCTION BOX	-A	1-JB	-292-0847 JV(	-A C	692 <b>'</b> Various	A06	B	100D	ALL	COMPONENT	PROTECTION	ı
PA						·				R_2	2 <u>R</u> 3	i R

			к <u> </u>	<u>n</u>	n
PREPARER/DATE	JLH	9-8-86	CAG	win	
	ETD	9-10-86	9-20-89 WCG	AT.	
CHECKLD DATE_			9-25-89	2.23.90	'

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# WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	AZMITH. NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	OPER TIME	<u>event</u>	SAFETY_FUNCTION
WBN-1-JB -292-10 Junction Box	05 -A	1-JB	-292-1005 JXA	-A	737 <b>'</b> Various	A05	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-10 Junction Box	)06 -B	1-JB	-292-1006 JXA	B	737 <b>%</b> Various	A05	·B	100D	ALL	COMPONENT PROTECTION
WBN-2-JB -292-10 JUNCTION BOX	)08 -B	2-JB	-292-1008 JXA	<b> B</b>	737' Various	A09	B	100D	ALL	COMPONENT PROTECTION
WBN-0-JB -292-11 Junction Box	163 -B	_ O-JB	-292-1163 JSE	<b>- B</b>	757' Various	A16	В	100D	ALL	COMPONENT PROTECTION
WBN-O-JB -292-11 Junction Box	164 -A	0-JB	-292-1164 JSE	-A	757 <b>'</b> Various	Aļ6	В	100D	ALL	COMPONENT PROTECTION

PREPARER/DATE JLH 9-8-86 CHECKED/DATE ETD 9-10-86

R_2___R_3__R____ <u>CAG</u> 9-20-89 <u>wcG</u> 9-25-89 2.23.90



BINDER ND. : WBNEQ-JBOX-001 Manufacturer : Various Page 7 of 51

# HATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

PRINT DATE: 02/02/90

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EQIS NUMBER DESCRIPTION		<u>UNIT Į</u>	DEVICE ID NO. Mode	AZMITH	-LOCATION- Elev(1) Contract	<u>RM⁄RAD</u>		<u>oper t</u>	IME EVENT	SAFETY FUNCTION	
				- -						•	R4
• •									·	\ \	
WBN-1-JB -292-1189 Junction Box	-A	1-JB	-292-1189 JYJ	-A	692" Various	A09	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1190 JUNCTION BOX	- B	1-JB	-292-1190 Jyj	B	692' Various	A10	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1195 JUNCTION BOX	-A	1-JB	292-1195 JYJ	-A	692' Various	A13	B	100D	AL	COMPONENT PROTECTION	
PAGE		·						•		р <b>2</b> р 3	p A
		· .			PREP. Chec	ARER∕DAT KED∕DATE	е <u> </u>	LH TD	9- 8-84 9-10-8	<u>CAG</u> <u>WCG</u> 9-10-89 <u>2-22-90</u> <u>6</u> <u>WCG</u> <u>RCF</u> 9-25-89 <u>2-23-90</u>	1-19-90 9-19-90 CSA 19/06/90

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BINDER NO. : WBNEQ-JBOX-Manufacturer : Various Page & OF 51



EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	AZMITH_ NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-JB -292-1196 JUNCTION BOX	- B	1-JB	-292-1196 JYJ	- B	692' Various	A12	<b>B</b> .	1000	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1231 JUNCTION BOX	- <b>A</b>	1-JB	-292-1231 JQD	-A	713' Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1232 Junction Box	- B	1-JB	-292-1232 JQD	- B	713' Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1235 Junction Box	-A	1-JB	-292-1235 JXA	-A	713' VARIOUS	A13	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1246 Junction Box	-A	1-JB	-292-1246 JXB	-A	713' VARIOUS	A13	B	100D	ALL	COMPONENT PROTECTION
PAGE A					PREPA CHECK	RER/DATE ED/DATE_	J E	<u>LH 9-</u> 7D 9-	8-86 10-84	$R_{2} R_{3} R_{$

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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	•	<u>UNIT</u>	DEVICE ID	NO. MODEL	AZMITH	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAT</u> (2)	OPER TIME	<u>event</u>	SAFETY FUNCTION	
WBN-1-JB -292-1352 JUNCTION BOX	-A	1-JB	-292-135	2 JXD	-A	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION	ranna A
WBN-1-JB -292-1353 Junction Box	-A	1 – J B	-292-135	ڊ AXL	-A	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1354 Junction Box	- B	1-1B	, -292-135	4 JXD	- <b>B</b>	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1355 Junction Box	- B	1-JB	-292-135	5 JXA	<b>- B</b>	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1356 JUNCTION BOX	- <b>A</b>	1-JB	-292-135	i6 JXA	-A	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION	1
PAGE A -10						PREP# CHECK	\RER∕DATI (ED∕DATE_	<u>€</u>	LH 9-5 TD 9-1	7-86 0-86	R <u>2</u> R <u>3</u> F <u>CHG</u> <u>wc</u> <u>H</u> 9-20-89 <u>R-20-90</u> <u>wc</u> <u>G</u> <u>H</u> 9-25-89 <u>2</u> -23-90	! 

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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

TOIS NUMBER		UNIT	DEVICE ID NO. MODEL	AZMITH	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION
WBN-1-JB -292-1357 Junction Box	-A	1-JB	-292-1357 JXA	-A	713' Various	A28	B	1000	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1358 Junction Box	<b>-B</b>	1-JB	-292-1358 JXD	- B	713' VARIOUS	A28	B .	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1367 JUNCTION BOX	-A	1-JB	-292-1367 JQG	-A	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1368 Junction Box	- B	1-JB	-292-1368 JQH	B	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1369 Junction Box	-A	1-JB	-292-1369 . JQG	A	713' VARIOUS	A28	<b>B</b> .	100D	ALL	COMPONENT PROTECTION
PAGE A - 11				•	PREPA CHECK	RER∕DATE ED∕DATE_	= 	LH 9-2 TD 9-1	8-86	$R_{2} R_{3} R_{$







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#### HATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER	UNIT DEVICE ID NO. AZMITH	LOCATION <u>ELEV(1)</u> <u>RM/RAD</u>	CAT OPER TIME	EVENT SAFETY FUNCTION
WBN-1-JB -292-1370 -A JUNCTION BOX	1-JB -292-1370 -A JQE	713' A28 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-1371 -B Junction Box	1-JB -292-1371 -B Jqe	713' A28 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-1391 -S Junction Box	1-JB -292-1391 -S JVC	692' AO1 Various	B 100D	ALL COMPONENT PROTECTION

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WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE 1D	NO. MODEL	AZMITH . NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENI	SAFETY FUNCTION	
WBN-1-JB -292-1421 Junction Box	-A	1-JB	-292-1421	JXA	<b>-A</b>	713' Various	A12	B	100D	ALL	COMPONENT PROTECTION	
, MBN-1-JB _292-1422 JUNCTION BOX	- <b>B</b>	1-JB	-292-1422	JXA	- B	713' Various	A11	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1425 JUNCTION BOX	- <b>A</b>	1-JB	-292-1425	JXA	-A	713' Various	A07	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-1426 Junction Box	- B	1-JB	-292-1426	JXA	-8	713' VARIOUS	A07	B	100D	ALL .	COMPONENT PROTECTION	
WBN-1-JB -292-1446 JUNCTION BOX	- B	1-JB	-292-1446	JXA	- B	713" VARIOUS	A06	B	100D	ALL	COMPONENT PROTECTION	

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			9-25-89	2.2390	

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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID	NO. Model	AZMITH	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	OPER TIME	EVENI	<u>SAFETY FUN</u>	CTION
WBN-1-JB -292-1447 Junction Box	-A	1-JB	-292-1447	JXA	<b>~A</b>	713' VARIOUS	A06	B	100D	ALL	COMPONENT	PROTECTION
WBN-2-JB -292-1448 Junction Box	- B	2-JB	-292-1448	JXA	<b>- B</b> .	713' Various	A19	B	100D	ALL	COMPONENT	PROTECTION
WBN-2-JB -292-1449 Junction Box	-A	2-JB	-292-1449	JXA	-A	713' Various	A19	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -292-1502 Junction Box	-A	j-JB	-292-1502	JXA	-A	713' Various	A06	B	100D	ALL	COMPONENT	PROTECTION
WBN-2-JB -292-1503 Junction Box	-A	2-JB	-292-1503	S JXA	-A	713' Various	A19	B	100D	ALL	COMPONENT	PROTECTION

PAGE  $\mathbf{A}$ 14 R3

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					-LOCATION ELEV(1) RM/RAD		 AD <u>CAT OPER TI</u>		ME EVENT SAFETY FUNCTION		CTION	
DESCRIPTION			MODEL	NUMBİ	ER	CONTRACT		(2)				
WBN-1-JB -292 Junction Box	-1504 -B	1-JB	-292-1504 JXA	- B	•	713' VARIOUS	A06	B	100D	ALL	COMPONENT	PROTECTION
WBN-2-JB -292 Junction Box	-1505 -B	2-JB	-292-1505 JXA	- B		713' VARIOUS	A19	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -292 Junction Box	-1506 -A	1-JB	-292-1506 JXA	-A		713' Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -292 JUNCTION BOX	-1507 -B	1-JB	-292-1507 JXA	B		713' Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-2-JB -292 Junction Box	-1508 -A	2-JB	-292-1508 JXA	- <b>A</b>		713' VARIOUS	A01	B	100D	ALL	COMPONENT	PROTECTION

PAGE A -15 R3

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PREPARER/DATE_	JLH	9-8-86	CAG	NOP	
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### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO. AZMITH MODEL NUMBER	LOCATION <u>ELEV(1)</u> <u>RM/RAD</u> <u>CONTRACT</u>	<u>CAT</u> OPER TIME (2)	EVENT	SAFETY FUNCTION
WBN-2-JB -292-1509 -B Junction Box	2-JB -292-1509 -B JXA	713' AO1 Various	B 100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1512 -A Junction Box	1-JB -292-1512 -A JVE	729' AUI Various	B 100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1514 -A Junction Box	1-JB -292-1514 -A JVE	729' AO2 Various	B 100D	ALL	COMPONENT PROTECTION C
WBN-1-JB -292-1516 -B Junction Box	1-JB -292-1516 -B JVE	729' AOI Various	B 100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1518 -B JUNCTION BOX	1-JB -292-1518 -B JVC	729' AO2 Various	B 100D	ALL	COMPONENT PROTECTION

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PREPARER/DATE JLH 9-8-86 CHECKED/DATE ETD 9-10-86	<u>CAG</u> 9-24-89 <u>WCG</u> 9-25-89	1.20-40 2.20-40 AT 2.23:90	



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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS_NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	AZMITH	LOCATION- ELEV(1) CONTRACT	RM⁄RAD	<u>CAI</u> (2)	<u>OPER TIME</u>	EVENI	SAFETY FUNCTION
WBN-1-JB -292-1543 JUNCTION BOX	-A	1-JB	-292-1543 JFD	-A	692 <b>'</b> Varidus	A07	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1544 Junction Box	-B	1-JB	-292-1544 JFD	B	692' Various	A07	B	100D	ALL	COMPONENT PROTECTION
WBN-0-JB -292-1547 Junction Box	-A	0-JB	-292-1547 JXA	<b>-A</b>	737 <b>'</b> Various	A01	B	100D	ALL .	COMPONENT PROTECTION
WBN-0-JB -292-1548 Junction Box	- B	0-JB	-292-1548 JXA	- B	737' Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1549 JUNCTION BOX	-A	1-JB	-292-1549 JXA	-A	737' Various	A05	B	100D	ALL	COMPONENT PROTECTION
PAGE <u>A - 17</u> R				·	PREPA Check	RER∕DATE ED∕DATE_	J E	LH 9-8- TD 9-10	<u>86</u> - 86	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EATS NUMBED		UNIT	DEVICE ID NO	 AZMITH	LOCATION-	RM/RAD	CAT	OPER TIME	EVENT	SAFETY FUN	CTION
DESCRIPTION		<u>VIII I</u>	MODE	L NUMBER	CONTRACT		(2)				
WBN-2-JB -292-1550 Junction Box	-A	2-JB	-292-1550 JXA	-A	737 <b>'</b> Various	A09	B	100D	ALL	COMPONENT I	PROTECTION
WBN-1-JB -292-1551 JUNCTION BOX	- B	1-JB	-292-1551 JXA	-B	737' Various	A05	B	100D	ALL	COMPONENT I	PROTECTIOŅ
WBN-2-JB -292-1552 Junction Box	- B	2-JB	-292-1552 JXA	. <b>- B</b>	737 VARIOUS	A09	B	100D	All	COMPONENT I	PROTECTION
WBN-2-JB -292-1553 Junction Box	- <b>A</b>	2-JB	-292-1553 JFD	-A	692' Various	A25	B	100D	ALL	Component (	PROTECTION
WBN-2-JB -292-1554 Junction Box	- B	2-JB	-292-1554 JFD	-B	692' Various	A25	B	100D	ALL	COMPONENT	PROTECTION

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			9-25-89	1.23.90	







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### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS_NUMBER DESCRIPTION		<u>UNIT</u>	DEVICE ID NO. Model	AZMITH NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	OPER TIME	<u>EVENT</u>	SAFETY FUNCTION
WBN-2-JB -292-1555 Junction Box	-A	2-JB	-292-1555 JYJ	-A	692' VARIDUS	A25	B	100D	ALL	COMPONENT PROTECTION
WBN-2-JB -292-1556 Junction Box	B	2-JB	-292-1556 JYJ	<b>-</b> B .	692' Various	A25	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1564 Junction Box	-A	1-JB	-292-1564 JXA	- A	692' Various	A08	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1565 Junction Box	- B	1-JB	-292-1565 JXA	- B	692 <b>'</b> Various	A08	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-1566 JUNCTION BOX	- B	1-JB _.	-292-1566 JXA	-B	692" VARIOUS	A08	B	100D	ALL	COMPONENT PROTECTION
PAGE A -					PREPA CHECK	RER/DATE ED/DATE_	J. E	LH 9-1 TD 9-1	8-86 0-86	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

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#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

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EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODE	AZMITH_ L_NUMBER	-LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	CAT (2)	OPER TIME	EVENT	<u>SAFETY FU</u>	NCTION	<u> </u>	
WBN-1-JB -292-1567 Junction Box	-A	1-JB	-292-1567 JXA	-A	692 <b>'</b> Various	A08	<b>B</b> .	100D	ALL	COMPONENT	PROTECTION		
WBN-1-JB -292-1598 Junction Box	<b>-A</b>	1-JB	-292-1598 JXA	<b>-A</b>	713' Various	A28	B	100D	ALL ,	COMPONENT	PROTECTION		
WBN-1-JB -292-1599 Junction Box	-B	1-JB	-292-1599 JXA	-B	713' Various	<b>A28</b> .	B	100D	ALL	COMPONENT	PROTECTION		
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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

					LOCATION-	RMZRAD	CAT	OPER TIME	EVENT	SAFETY FUN		_
EQIS NUMBER DESCRIPTION			MODEL	NUMBER	<u>CONTRACT</u>		(2)	<u> — L. R. M </u>				
WBN-1-JB -292 Junction Box	-1933 -S	1-JB	-292-1933 JVH	-S	692' Various	A01	B	1000	ALL	COMPONENT	PROTECTION	
WBN-0-JB -292 Junction Box	-1942 -A	0-JB	-292-1942 JXA	-A	757' Various	A16	B	100D	ALL	COMPONENT	PROTECTION	
WBN-O-JB -292 Junction Box	-1943 -B	0-JB	-292-1943 JXA	B	757 <b>'</b> Various	A16	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -292 Junction Box	-1964 -B	1-JB	-292-1964 JWB	- B	737' VARIOUS	A01	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -292 Junction Box	-1966 -A	1-JB	-292-1966 JWB	-A	737' Various	A01	B	100D	ALL	COMPONENT	PROTECTION	

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### WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER	UNIT DEVICE ID NO. AZMITH MODEL NUMBER	-LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAT OPER TIME</u> (2)	EVENT SAFETY FUNCTION
WBN-1-JB -292-1968 -A JUNCTION BOX	1-JB -292-1968 -A JWH	737" A05 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-1970 -B Junction Box	1-ЈВ -292-1970 -В ЈWН	737' A05 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-1972 -B Junction Box	1-ЈВ -292-1972 -В ЈИН	729' AO1 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-1974 -A Junction Box	1-ЈВ -292-1974 -А ЈWH	729" AO1 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-1985 -A Junction Box	1-JB -292-1985 -A JVC	729' AO1 Various	B 100D	ALL COMPONENT PROTECTION
PAGE				R_2 R_3 R_

R_2___R_3___ PREPARER/DATE______ 9-8-86 <u>CAG</u> 9-20-89 WCG 9-25-89 2-22-90 AT ETD 9-8-86 CHECKED/DATE_ 1.23.90





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# WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EATS NUMBER			HNTT I	NEVICE ID NO	 A7MITH	LOCATION MITH <u>ELEV(1)</u> _RM/RAD		<u>CAT OPER TIME</u>		EVENT	I SAFETY FUNCTION		
DESCRIPTION				MODEL	NUMBER	CONTRACT	<u></u>	(2)	<u></u>				
WBN-1-JB - Junction Bo	292-1986 X	B	1-JB	-292-1986 JVC	- <b>B</b>	729 <b>'</b> Various	A01	B	100Ð	ALL	COMPONENT	PROTECTION	
WBN-1-JB - Junction Bo	292-1987 X	-B	1-JB	-292-1987 JVE	- <b>B</b>	729' VARIOUS	A02	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB - Junction Bo	292-1988 X	-A	1-JB	-292-1988 JVE	- <b>A</b>	729 <b>'</b> Various	A02	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB - Junction Bo	292-2007 X	- B	1-JB	-292-2007 JYJ	B	692' Various	A07	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB - Junction Bo	292-2008 X	-A	1-JB	-292-2008 JYJ	-A	692' VARIOUS	A07	B	100D	ALL	COMPONENT	PROTECTION	

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PREPARER/DATE_	JLH	9-8-86	CAG	win	
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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT I	DEVICE ID NO. Mode	AZMITH_ NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION	
WBN-1-JB -292-20 Junction Box	)12 -B	1-JB	-292-2012 JXD	<b>- B</b>	713' Various	A13	B	100D	ALL	COMPONENT PROTECTIO	N
WBN-1-JB -292-20 Junction Box	)13 -A	1-JB	-292-2013 JXD	-A	713 Various	A13	B	100D	ALL	COMPONENT PROTECTIO	N
WBN-1-JB -292-20 Junction Box	134 - A	1-JB	-292-2034 JQD	-A	713 <b>'</b> Várious	A01	B	100D	ALL	COMPONENT PROTECTIO	N
WBN-O-JB -292-20 Junction Box	135 -B	0-JB	-292-2035 JQD	- B	713' Various	A01	B	100D	AĽL	COMPONENT PROTECTIO	N     R4

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# WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		<u>UNIT</u>	<u>DEVICE ID NO.</u> Model	AZMITH	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	<u>OPER_TIME</u>	<u>event</u>	SAFETY FUNCTION	R
WBN-1-JB -292-2063 Junction Box	-A	1-JB	-292-2063 JXA	-A	692' Various	A07	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-2064 Junction Box	- B	1-JB _.	-292-2064 JXA	<b>- B</b>	692' Varidus	A07	B	100D	ALĽ	COMPONENT PROTECTION	
WBN-1-JB -292-2065 Junction Box	<b>-A</b>	1-JB	-292-2065 JFE	-A	692' Various	A07	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-2066 JUNCTION BOX	- B	1-JB	-292-2066 JFE	- B	692' Various	A07	B	100D	ALL	COMPONENT PROTECTION	
PAGE A -25 R					PREP <i>I</i> Check	ARER/DATI (ED/DATE_	= J E	<u>LH 9-</u> TD 9-	8-8. 10-8	R <u>Z</u> R <u>3</u> R <u>-</u> 6 <u>CAG</u> <u>WCG</u> <u>WC</u> <del>7-26-89</del> 2-22-96 <u>7-25-89</u> <u>2-21-96</u> <u>9-25-89</u> <u>2-21-96</u> <u>9</u>	4 - 70 - 70 - 70 - 70 - 70 - 70 - 70







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# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

	EQIS NUMBER	UNIT DEVICE I	<u>D NO. AZMITH</u> MODEL NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	CAT OPER TIME	EVENT SAFETY	VENT SAFETY FUNCTION		
	WBN-1-JB -292-2071 -A JUNCTION BOX	1-JB -292-20	)71 –A JXA	737' AQ1 Various	B 100D	ALL COMPONE	NT PROTECTION		
	WBN-1-JB -292-2122 -A Junction Box	1-JB -292-21	22 -A JQE	713' AO6 Various	B 100D	ALL COMPONE	NT PROTECTION		
	WBN-1-JB -292-2140 -A Junction Box	1-JB -292-21	40 – A JVC	729' ADI Various	B 100D	ALL COMPONE	NT PROTECTION		
	WBN-1-JB -292-2141 -B Junction Box	1-JB -292-21	41 -B JVC	729' AO1 Various	B 100D	ALL COMPONE	NT PROTECTION		
	WBN-1-JB -292-2202 -A Junction Box	1-JB -292-22	02 -A JXB	737' A05 Various	B 100D	ALL COMPONE	NT PROTECTION		
•.	PAGE A -26 R		· .	PREPARER/DATE Checked/date_	JLH 9-8 ETD 9-10	R 5-86 0-86 9- 9- 9- 9-	2 R <u>3</u> R <u>AG</u> <u>AJC</u> ²⁰ <u>20-89</u> <u>A-22-90</u> <u>25-89</u> <u>2-23-90</u>		







#### WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER		UNIT	DEVICE ID NO.	AZMITH_	LOCATION- ELEV(1)	<u>RM/RAD</u>	CAI	<u>OPER TIME</u>	EVENI	SAFETY FUNCTION	-
DESCRIPTION			<u>MODE</u>	L NUMBER	<u>CONTRACT</u>		(2)				
WBN-1-JB -292-2204 Junction Box	- <b>A</b>	1-JB	-292-2204 JXD	-A	737 <b>'</b> Various	<b>A01</b>	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-2205 Junction Box	-A	1-1B	-292-2205 JXD	-A	737 <b>'</b> Various	A01	B	1000	ALL	COMPONENT PROTECTION	
NBN-1-JB -292-2206 Junction Box	- <b>A</b>	J-1B	-292-2206 JXD	- <b>A</b>	737' Various	A01	B	100D	ALL	COMPONENT PROTECTION	
∲:BN-1-JB -292-2207 JUNCTION BOX	· -A	1-JB	-292-2207 JQD	-A	692 <b>'</b> Various	A07	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -292-2208 JUNCTION BOX	- B	1-JB	-292-2208 JXD	- B	737' Various	A01	B	100D	ALL	COMPONENT PROTECTION	

PAGE レ 25

R<u>2</u> R<u>3</u> R_ JLH 9-8-86 PREPARER/DATE__ AG NCO 2-22-42 CHECKED/DATE ETD 9-10-86 9-20-89 WCG R7 9-25-19 1.23.90


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#### WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

		LOCATION	CAT OPER TIME	EVENT SAFETY FUNCTION
DESCRIPTION	MODEL NUMBER	R CONTRACT	(2)	
WBN-1-JB -292-2209 -B. JUNCTION BOX	1-JB -292-2209 -B JXB	737' A05 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-2211 -B JUNCTION BOX	1-JB -292-2211 -B JQD	692 A07 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-2212 -B JUNCTION BOX	1-JB -292-2212 -B JXD	737' AO1 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-2234 -S Junction Box	1-JB -292-2234 -S JVE	692' A01 Various	B 100D	ALL COMPONENT PROTECTION
WBN-1-JB -292-2236 -S JUNCTION BOX	1-JB -292-2236 -S JXD	692' A01 Various	B 100D	ALL COMPONENT PROTECTION

R<u>3</u> R_2_ JLH 9-8-86 CAG Q-60-89 WCG Q-25-89 2-23-90 2-23-90 PREPARER/DATE ETD 9-10-86 CHECKED/DATE_







EQIS NUMBER DESCRIPTION	UNIT DEVICE ID NO, AZMITH MODEL NUMBER	LOCATION ELEV(1) RM/RAD CONTRACT	<u>CAT OPER TIME E</u> (2)	VENI SAFETY FUNCTION
WBN-1-JB -292-2238 -S Junction Box	1-JB -292-2238 -S JVC	692¶ A06 Various	B 100D A	LL COMPONENT PROTECTION
WBN-1-JB -292-2240 -A Junction Box	1-JB -292-2240 -A JVA	692' A06 Various	B 100D A	LL COMPONENT PROTECTION
WBN-1-JB -292-2242 -S JUNCTION BOX	1-JB -292-2242 -S JVB	6929 A06 Various	B 100D A	LL COMPONENT PROTECTION
WBN-1-JB -292-2244 -A Junction Box	1-JB -292-2244 -A JVA	6929 A06 Various	B 100D A	LL COMPONENT PROTECTION
WBN-1-JB -292-2248 -B Junction Box	1-JB -292-2248 -B JVA	692' A06 Various	B 100D A	LL COMPONENT PROTECTION

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R<u>3</u> R_ R_2_ 9-8-86 PREPARER/DATE JLH <u>CHG</u> <u>222-89</u> <u>9-20-89</u> <u>222-90</u> <u>WCG</u> <u>R7</u> <u>9-25-89</u> <u>2.23-90</u> E7D CHECKED/DATE_

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EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	NŪME	AZMITH	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-JB -292-2249 Junction Box	- B	1-JB	-292-2249 JVA	-B	• •	692' Various	A06	B	1000	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2252 JUNCTION BOX	-A	1-JB	-292-2252 JXA	-A		757 <b>!</b> Various	A16	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2257 JUNCTION BOX	-A	1-JB	-292-2257 JQE	-A		713' VARIOUS	. A06	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2260 Junction Box	<b>- B</b>	1-JB	-292-2260 JQE	- B		713' VARIOUS	A06 .	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2262 Junction Box	- B	1-JB	-292-2262 JXA	- B		757 <b>'</b> Various	A16	B	100D	ALL	COMPONENT PROTECTION
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R_2 R_3 PREPARER/DATE_JLH 9-8-86 9-10-86 CHECKED/DATE 270

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EQIS NUMBER		UNIT	DEVICE ID NO.	AZMITH_	LOCATION- <u>ELEV(1)</u>	RM/RAD	CAI	OPER TIME	EVENT	SAFETY FUNCTION
DESCRIPTION			MODEL	NUMBER	CONTRACT		(2)	•		
WBN-1-JB -292-2265 Junction Box	-B	1-JB	-292-2265 JXD	- B	737 <b>'</b> Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2386 Junction Box	-B	1-JB	-292-2386 JXA	- B	737' Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2387 Junction Box	. <b>-</b> A	1-JB	-292-2387 JXA	-A	737' Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2388 JUNCTION BOX	-A	1-JB	-292-2388 JXA	-A	737 <b>'</b> Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-2-JB -292-2389 JUNCTION BOX	-A	2-JB	-292-2389 JWB	-A	737 VARIOUS	A01 .	B	100D	ALL	COMPONENT PROTECTION

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R3 r 2 R 9-8-86 ĽH CAG <u>CAG</u> wcr <u>4-20-89</u> 2-22-90 wcg <u>M7</u> 9-25-89 2-2390 PREPARER/DATE ETD 9-10-86 CHECKED/DATE_ i





BINDER NO. : WBNEQ-JBOX-MANUFACTURER : VARIOUS PAGE 31 OF 51

# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	AZMITH_ NUMBER	LOCATION- ELEV(1) CONTRACI	RM⁄RAD	<u>CAT</u> (2)	OPER TIME	<u>EVENI</u>	SAFETY FUNCTION
WBN-2-JB -292-2390 JUNCTION BOX	- B	2-JB	-292-2390 JWB	- B	737 <b>'</b> Various	A01	B	100D	ALL	COMPONENT PROTECTION
WBN-2-JB -292-2391 JUNCTION BOX	-A	2-JB	-292-2391 JWB	-A	737 <b>'</b> Various	A01 .	В	1000	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2503 JUNCTION BOX	B	1-JB	-292-2503 JFG	-B	676' Various	A 0 8	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-2504 Junction Box	-A	1-JB	-292-2504 JFG	-A	676 <b>'</b> Various	A09	B	100D	ALL	COMPONENT PROTECTION
NBN-1-JB -292-2507 Junction Box	B	1-JB	-292-2507 JFG	- B	676' Varidus	A10	B	100D	ALL	COMPONENT PROTECTION

R<u>3</u> R 2 PREPARER/DATE_JLH 9-8-86 <u>CAG</u> <u>G-2-F9</u> <u>WCG</u> <u>4-25-89</u> <u>2-22-90</u> <u>47</u> <u>7-25-84</u> <u>2-23-90</u> 9-10-86 ETD CHECKED/DATE

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EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	AZMITH NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	<u>OPER TIME</u>	EVENT	<u>SAFETY FU</u>	YCTION	
WBN-1-JB -292-2508 JUNCTION BOX	-A	1-JB	-292-2508 JQE	-A	676' Various	A11	B	100D	ALL	COMPONENT	PROTECTION	; ;
WBN-2-JB -292-2761 JUNCTION BOX	- B	2-JB	-292-2761 JXA	- B	757 <b>'</b> Various	<b>A16</b> .	B	100D	ALL	COMPONENT	PROTECTION	
WBN-2-JB -292-2762 JUNCTION BOX	-A .	2∸JB	-292-2762 JXA	-A	757 <b>'</b> Variqus	A16	B	100D	ALL	COMPONENT	PROTECTION	
WBN-0-JB -292-2765 Junction Box	-A	0-JB	-292-2765 JQE	-A	692' Various	A01	B	100D	ALL	COMPONENT	PROTECTION	
WBN-O-JB -292-2766 Junction Box	- B	0-JB	-292-2766 JQE	B	692' Various	A01	B	100D	ALL	COMPONENT	PROTECTION	

9-8-86 9-10-86 PREPARER/DATE JLH ETD CHECKED/DATE

R 2 R 3 <u>CAG</u> wcr q-20-89 2-22-90 wcg At q-25-89 2.23.90

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EQIS NUMBER		UNIT	DEVICE ID NO.	AZMITH	LOCATION- ELEV(1)	<u>RM/RAD</u>	ÇAŢ	<u>OPER TIME</u>	EVENT	SAFETY FUN	ICTION
DESCRIPTION			<u> </u>	NUMBER	CONTRACT		(2)				
WBN-O-JB -292-2856 Junction Box	-A	0-JB	-292-2856 JXA	-A	737' Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-O-JB -292-2894 Junction Box	- B	0-jB	-292-2894 JXA	- B	737' VARIOUS	A01	B	100D _	ALL	COMPONENT	PROTECTION
WBN-1-JB -292-3032 JUNCTION BOX	- B	1-JB	-292-3032 JXA	- B	713' Various	A28	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -292-3033 Junction Box	-A	1-JB	-292-3033 JXB	-A	713' Various	A28	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -292-3208 JUNCTION BOX	<b>-A</b>	1-JB	-292-3208 JXA	- <b>A</b>	692 <b>'</b> Various	A07	B	100D	ALL	COMPONENT	PROTECTION

R 2 R 3 PREPARER/DATE JLH 9-8-86 CAG WCM 9-20-59 2-92-99 WCG AT 9-25-89 2.13.70 CHECKED/DATE ETD 9-10-86

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#### HATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID	NO. MODEL	NUMB	AZMITH	LOCATION- <u>ELEV(1)</u> <u>CONTRACT</u>	<u>RM/RAD</u>	<u>CAI</u> (2)	OPER TIME	EVENT	SAFETY FUI	ICTION
WBN-0-JB -292-3213 JUNCTION BOX	-B	0-JB	-292-3213	AXL	- B		692 <b>'</b> Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -292-3214 JUNCTION BOX	- B	1-JB	-292-3214	JXA	- B		737' Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-0-JB -292-3215 JUNCTION BOX	-A	0-JB	-292-321	AXL	-A	·	737 <b>'</b> Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-0-JB -292-3341 Junction Box	B	0-JB	-292-3341	AXL	- B		737 <b>'</b> Various	A01	B	100D	ALL	COMPONENT	PROTECTION
WBN-0-JB -292-3342 Junction Box	-A	0-JB	-292-3342	ZAXL	-A		737' Various	A01	B	100D	ALL \	COMPONENT	PROTECTION

R<u>2</u> R<u>3</u> R <u>CAG</u> 9-20-89 9-20-89 <u>9-25-89</u> 7-25-89 2.23.90 PREPARER/DATE JLH 9-8-86 CHECKED/DATE ETD 9-10-86

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BINDER NO. : WBNEQ-JBOX-MANUFACTURER : VARIOUS PAGE 35 OF 51

# WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

FOTO MUMBER			NEVICE ID NO.	AZMITH_	LOCATION-	RM/RAD	ÇAŢ	OPER TIME	<u>EVENT</u>	SAFETY FUNCTION
DESCRIPTION			MODEL	NUMBER	CONTRACT		(2)			
WBN-1-JB -292-3422 Junction Box	<b>-</b> A	1-JB	-292-3422 Jqq	-Á	713' VARIOUS	A28	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-3423 JUNCTION BOX	- B	1-JB	-292-3423 JQQ	- B	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-3424 Junction Box	-A	1-JB	-292-3424 JVB	-A	713" Various	A28	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-3425 Junction Box	-Ą	1-JB	-292-3425 JVB	- <b>A</b>	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292-3426 Junction Box	- B	1-JB	-292-3426 JVB	- B	713' Various	A28	B	100D	ALL	COMPONENT PROTECTION

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PREPARER/DATE	JLH	9-8-86	CAG	wen	
	ETD	9-10-86	9-20-89 <u>WCG</u>	11.4.	
01120122. 2111			9-25-84	2.23.90	

BINDER NO. : WBNEQ-JBOX-001 Manufacturer : Various Page 36 of 51

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#### PRINT DATE: 02/02/90

## HATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER Description		UNIT	DEVICE ID NO. Model	AZMITH NUMBER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	OPER TIME	EVENI	SAFETY FUNCTION
WBN-1-JB -292-3 JUNCTION BOX	5427 -B	Ì-JB	-292-3427 JVB	- <b>B</b>	713 VARIOUS	A28	В	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292- Junction Box	3870 -A	1 – J B	-292-3870 JWH	-A	737' Various	A01	B	100D	ALL	COMPONENT PROTECTION R4
WBN-1-JB -292- Junction Box	4011 -A	1-JB	-292-4011 JXA	. <b>- A</b>	729 VARIOUS	A01 .	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292- JUNCTION BOX	4013 -A	1-JB	-292-4013 JXA	- A	737 <b>'</b> Various	A05 .	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -292- Junction Box	4015 -B	1-JB	-292-4015 JXA	- B	737 <b>'</b> Various	A05	B	100D	ALL	COMPONENT PROTECTION
	<b>JE</b> A -37 R4				PREPA Check	ARER/DATI (ED/DATE	₌ J E	<u>LH 9-8</u> TD 9-1	1:86 0-86	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$





BINDER NO. : WBNEQ-JBOX-MANUFACTURER : VARIOUS PAGE 37 OF 51

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#### WATTS BAR NUCLEAR PLANT TABA- EQUIPMENT IDENTIFICATION MATRIX

EQ		BER		UNIT	DEVICE ID NO.	AZMITH	LOCATION- ELEV(1)	<u>RM/RAD</u>	ÇAT	OPER TIME	EVENI	SAFETY FUI	ICTION	
DE	SCRIPT	ION			MODEL	NUMBER	<u>CONTRACT</u>	·····	(2)					
WBI JUI	N-1-JB Nction	-292-4026 BOX	- B	1-JB	-292-4026 JVE	- B	737 <b>'</b> Various	A05	B	100D	ALL	COMPONENT	PROTECTION	
WBI JUI	N-1-JB NCTION	-292-4027 BOX	-A	1-JB	-292-4027 JVE	-A	737' Various	A05	B	100D	ALL .	COMPONENT	PROTECTION	
WB Jui	N-1-JB NCTION	-292-4166 BOX	-A	1-JB	-292-4166 JVE	-A	729' Various	A04	B	100D	ALL	COMPONENT	PROTECTION	
WBI JUI	N-1-JB Nction	-292-4167 BOX	- B	Ì-1₿	-292-4167 JVE	-B	729' VARIOUS	A04	B	100D	ALL	COMPONENT	PROTECTION	
WBI JUI	N-1-JB NCTION	-292-4261 BOX	- B	1-JB	-292-4261 JXA	B	713! Various	A01	B	100D	ALL	COMPONENT	PROTECTION	

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R_2_ R_3_ R_ PREPARER/DATE JLH 9-8-86 CAG WSP 9-20-87 122-90 WCG AT CAG CHECKED/DATE ETD 9-10-86 WCG 9-25-8





BINDER NO. : WBNEQ-JBOX-MANUFACTURER : VARIOUS PAGE 38 OF 51

#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER	UNIT DEVICE ID NO.	AZMITH	LOCATION ELEV(1)_ RM/RAD	<u>ÇAT OPER TIME</u>	EVENT SAFETY FL	INCTION
DESCRIPTION	MODEL	NUMBER	<u>CONTRACT</u>	(2)		
WBN-1-JB -292-4275 -A Junction Box	1-JB -292-4275 JQO	-A	737 AOI Various	B 100D	ALL COMPONENT	PROTECTION
WBN-1-JB -292-4984 -A Junction Box	1-JB -292-4984 JQB	-A .	757' Al6 Various	B 100D	ALL COMPONENT	PROTECTION
WBN-1-JB -292-4985 -B JUNCTION BOX	1-JB -292-4985 JQB	-B 321	757' A16 Various	B 100D	ALL COMPONENT	PROTECTION
WBN-1-JB -293-0159 -B Junction Box	1-JB -293-0159 JVC	-B 341	804' 7" UC Various	B 100D	ALL COMPONENT	PROTECTION
WBN-1-JB -293-0368 -B Junction Box	1-JB -293-0368 JVC	-B 163	806' UC Various	B 100D	ALL COMPONENT	PROTECTION

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R 2 R3 PREPARER/DATE JLH 9-8-86 CAG WCP 9-20-89 1-22-90 WCG AF 9-25-89 2-23-90 9-10-86 ETD CHECKED/DATE__







EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	NUM	AZMITH_ BER	LOCATION- ELEV(1) CONTRACT	RMZRAD	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-JB -293-0369 Junction Box	-A	1-JB	-293-0369 JVC	-A	0	706 <b>' 7"</b> Various	LC	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-0394 JUNCTION BOX	-A	1-JB	-293-0394 JVD	-A	045	706' Various	RW	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-0542 Junction Box	-A	1-JB	-293-0542 JVB	-A	234	736' 4" Various	AC3	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-0544 Junction Box	-A	1-J <u></u> B	-293-0544 JVC	-A	248	754' Various	LC	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-0546 Junction Box	-B	1-JB	-293-0546 JXA	- B	300	724' 5" VARIOUS	ANN	B	100D	ALL	COMPONENT PROTECTION

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R_2___R_3__R____ PREPARER/DATE JLH 9-8-86 <u>CAG</u> 4207 9-20-89 2-22-90 WCG 47 9-25-89 2-23-90 CHECKED/DATE ETD 9-10-86

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EQIS NUMBER Description	}		UNIT	DEVICE ID NO. MOD	<u>el nu</u> m	AZMITH_ BER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	OPER TIME	<u>event</u>	SAFETY FUN	ICTION
WBN-1-JB - Junction Bo	-293-0548 )X	-B	1-1B	-293-0548 JQE	- B	248	753'10" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB - JUNCTION BO	-293-0550 )X	-A	1-JB	-293-0550 JQB	. <b>-A</b>	287	792' VARIOUS	ANN	В	100D	ALL	COMPONENT	PROTECȚIOŅ
WBN-1-JB - Junction BC	-293-0553 )X	<b>-</b> A	1-JB	-293-0553 JSE	<b>-</b> A	294	744' 6" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB - Junction Bo	-293-0574 )X	-A	1-JB	-293-0574 JVB	-A	013	734 9 <b>"</b> Various	FN1	B	100D	ALL	COMPONENT	PROTECTION

WBN-1-JB -293-0578 -B 1-JB -293-0578 -B 349 730' 5" FN1 B 100D ALL COMPONENT PROTECTION JUNCTION BOX JVB VARIOUS

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R_2 R3____ R PREPARER/DATE JLH 9-8-86 CAG won 9-20-84 2-22-20 9-10-86 CHECKED/DATE ETD weg 9-25-89 1.23.90





BINDER NO. : WBNEQ-JBOX MANUFACTURER : VARIOUS PAGE 41 OF 51

#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

FOTS NUMBED		DEVICE TO NO		Δ7MTTH	LOCATION-	RM/RAD	CAT	OPER TIME	EVENT	SAFETY FUNCTION	
DESCRIPTION		MODEL	NUM	BER	CONTRACT		(2)	<u></u>			
WBN-1-JB -293-0596 - Junction Box	1-JB	-293-0596 JVC	-B	346	706 7 7 Various	LC	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-0656 -/ Junction Box	1-JB	-293-0656 JVC	-A	132	731' 7" Various	AC2	B	100D	ALL	COMPONENT PROTECTION	
IBN-1-JB -293-0691 -/ JUNCTION BOX	1-JB	-293-0691 JVB	-A	213	706' Various	RW	B.	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-0724 - JUNCTION BOX	1-JB	-293-0724 Jqe	- <b>B</b>	059	748' 6" Various	ANN	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-0745 -/ Junction Box	1-JB	-293-0745 JVC	-A	199	805° 8" Various	UC	B	100D	ALL	COMPONENT PROTECTION	2

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R_2_ R_____ CHG WCA 9-20-89 1-12-90 WCG HT 9-25-89 2.23.90 PREPARER/DATE JLH 9-8-86 9-10-86 CHECKED/DATE E7D



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FOIS NUMBER		UNIT	DEVICE ID NO.		AZMITH_	LOCATION-	<u>RM⁄RÁD</u>	CAT	OPER TIME	EVENT	SAFETY_FU	ICTION
DESCRIPTION	······		MODEL	NUM	BER	CONTRACT		(2)				
WBN-1-JB -293-0760 JUNCTION BOX	- B	1-JB	-293-0760 JVC	-B	115	731' 4" Various	IIR	B	1000	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-0762 JUNCTION BOX	-A	1-JB	-293-0762 JQE	-A	105	751' 6" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-0764 Junction Box	-A	1-JB	-293-0764 JVC	A	060	740' 2" Various	IIR	B	10 <u>0</u> D	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-0766 JUNCTION BOX	- B	1-JB	-293-0766 JVJ	<b>B</b>	291	745' Various	AC4	B	100D	ALL .	COMPONENT	PROTECTION
WBN-1-JB -293-0768 Junction Box	-A	1-JB	-293-0768 JQG	-A	297	731 4 VARIOUS	ANN	B	100D	ALL	COMPONENT	PROTECTION

R<u>3</u> R____ R_2_ PREPARER/DATE <u>JLH</u> 9-8-86 CHECKED/DATE <u>E7D</u> 9-10-86 CAG wCD 9-20-39 20-99 WCG AT 9-25-89 2.1390



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#### WATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	NUM	AZMITH_ BER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	<u>event</u>	SAFETY FUNCTION	
NBN-1-JB -293-07 Junction Box	75 -A	Ì−JB	-293-0775 JVB	-A	035	720' 4" Various	AC1	B	1000	<b>ALL</b> ,	COMPONENT PROTECTION	
WBN-1-JB -293-07 Junction Box	′88 <b>−</b> A	1-JB	-293-0788 JQG	-A	287	727° 9" VARIOUS	ANN	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-07 Junction Box	92 -B	1-JB	-293-0792 JVD	- B	285	722' Various	AC4	·B	100D	ALL	COMPONENT PROTECTION	•
WBN-1-JB -293-07 Junction Box	95 -A	1-JB	-293-0795 JXA	-A	283	728'10" VARIOUS	ANN	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-10 Junction Box	134 -A	1-JB	-293-1034 JQD	-A	006	835' 9" VARIOUS	ANN	B	100D	ALL	COMPONENT PROTECTION	

R_2___R____R____ PREPARER/DATE JLH 9-8-86 CAG WCN 9-25-84 2.23.90 CHECKED/DATE ETD 9-10-86







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# WATTS BAR NULLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER		UNIT I	DEVICE ID NO.		AZMITH_	LOCATION- ELEV(1)	<u>RM⁄RAD</u>		OPER TIME	EVENT	SAFETY FU	ICTION
WBN-1-JB -293-1036 JUNCTION BOX	- B.	1-JB	-293-1036 JQD	-B	357	835' 9" VARIOUS	ANN	B.	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-1255 JUNCTION BOX	-A	1-JB	-293-1255 Jqe	- <b>A</b>	028	727 <b>'</b> 10" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-1277 JUNCTION BOX	-A	1-JB	-293-1277 JXA	-A	311	804'10" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-1283 JUNCTION BOX	B	1-JB	-293-1283 JXA	<b>- B</b>	317	804'10" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION
WBN-1-JB -293-1285 Junction Box	- B	1-1B	-293-1285 JXA	- B	319	804'10" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION

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R_2__R_3__R___ PREPARER/DATE JLH 9-8-86 CAG 9-20-89 221-90 WCG 9-25-89 223-90 ETD 9-10-86 CHECKED/DATE___





BINDER NO. : WBNEQ-JBOX MANUFACTURER : VARIOUS PAGE 45 OF 51

WATTS BAR NOLLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

	<del></del>	UNIT	DEVICE ID	<u>NQ.</u> Model 1	ĪŪME	AZMITH_ BER	LOCATION- <u>ELEV(1)</u> CONTRACT	<u>RM/RAD</u>	<u>CAI</u> (2)	OPER TIME	<u>EVENT</u>	SAFETY FUN	ICTION	
WBN-1-JB -293-1287 JUNCTION BOX	: -A	1-JB	-293-1287	JXA	-A	313	804'10" Various	ANN	B	100D	ALL	COMPONENT	PROTECTION	-
WBN-1-JB -293-1576 Junction Box	-A	1-JB	-293-1576	JAC	-A	100	787 <b>'</b> Various	PRS	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -293-1736 Junction Box	- B	1-JB	-293-1736	JAB .	-B	304	738' 6" VARIOUS	AC4	B	100D	ALL	COMPONENT	PROTECTION	I
WBN-1-JB -293-1738 JUNCTION BOX	- B	1-JB	-293-1738	JAC	- <b>B</b>	285	720' Various	AC4	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -293-1750 JUNCTION BOX	-A	1-JB	-293-1750	JAC .	- <b>A</b>	308	724'10" VARIOUS	AC4	B	100D	ALL	COMPONENT	PROTECTION	-

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R_2_ R<u>3</u> CAG wer 920-89 2227" weg A7 9-25-89 223.70 PREPARER/DATE_JLH 9-8-86 9-10-86 E7DCHECKED/DATE_

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BINDER NO. : WBNEQ-JBOX-MANUFACTURER : VARIOUS PAGE 46 OF 51



EQIS NUMBER DESCRIPTION		<u>UNIT</u>	DEVICE ID NO. MODEL	NUM	AZMITH_ IBER	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	<u>SAFETY FUI</u>	NCTION	
WBN-1-JB -293-1758 Junction Box	- B	1-JB	-293-1758 FIELD	-B	280	719 <b>'</b> 10" Various	AC4	· B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -293-1764 Junction Box	B	1-JB	-293-1764 JVC	- B	285	719 <b>'</b> 11" Various	AC4	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -293-1883 Junction Box	-B	1-JB	-293-1883 JXA	- B	165	727'11" VARIOUS	ANN	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -293-1885 Junction Box	-A	1-JB	-293-1885 JXA	-A	191	727 <b>'</b> 11 <b>"</b> VARIOUS	ANN	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -293-1887 Junction Box	A	1-JB	-293-1887 JXA	-A	007	725' 3" VARIOUS	ANN	B	100D	ALL	COMPONENT	PROTECTION	2 1

PAGE 4-てい

R_3 r<u>2</u> 9-8-86 9-10-86 PREPARER/DATE JLH CAG wCN 9-20-89 UN-40 WCG AT 9-25-84 J.D.90 E7D CHECKED/DATE_



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#### HATTS BAR NUCLEAR PLANT TABA-EQUIPMENT IDENTIFICATION MATRIX

EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO	<u>DEL NU</u> M	AZMITH_ BER	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>Cat</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-JB -293-1889 - Junction Box	B	1-JB	-293-1889 JX	- B A	350	728! 2" VARIOUS	ANN'	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-1921 - Junction Box	- <b>A</b> :	1-JB	-293-1921 JV	-A B	297	718' 1" Various	AC4	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-2649 - Junction Box	• <b>A</b> ]	1-JB	-293-2649 JV(	C -A		805' 7" Various	UC	B	100D	) ALL	COMPONENT PROTECTION
WBN-1-JB -293-3193 - Junction Box	B	1-JB	-293-3193 JV	-B D		784'10" Various	UC	B	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-3201 - Junction Box	B	1-JB.	-293-3201 JV)	- B B	288	720' 3" VARIOUS	AC4	B	100D	ALL	COMPONENT PROTECTION
PAGE			·								R_2R_3R

<u>CAG</u> wcn 9-20-89 vin-70 wcg 9-25-69 J.J.9 PREPARER/DATE JLH 9-8-86 9-10-86 CHECKED/DATE ETD



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#### WATTS BAR NUCLEAR PLANT TABA - EQUIPMENT IDENTIFICATION MATRIX

EQIS_NUMBER		<u>UNIT</u>	DEVICE ID NO. MODEL	NUM	AZMITH_ BER	LOCATION- Elev(1) Contract	<u>RM⁄RAD</u>	<u>CAT</u> (2)	OPER TIME	EVENT	SAFETY FUNCTION
WBN-1-JB -293-3203 Junction Box	-A	1-JB	-293-3203 JVB	-A	235	721' 2" VARIOUS	AC3	B.	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-3317 Junction Box	- B	1-JB	-293-3317 JVB	- <b>B</b>	280	732"11" VARIOUS	AC4	B.	100D	ALL	COMPONENT PROTECTION
WBN-1-JB -293-4326 JUNCTION BOX	- D	1-JB	-293-4326 JVB	- D	030	720' 5" VARIOUS	LC	B	100D	ALL .	COMPONENT PROTECTION
WBN-1-JB -293-4328 JUNCTION BOX	D	1-JB	-293-4328 JVB	-D	050	721'11" VARIOUS	LC	B	100D	ALL -	COMPONENT PROTECTION
WBN-1-JB -293-4330 Junction Box	-E	1-JB	-293-4330 JVB	-E	<b>150</b>	721' VARIOUS	LC	B	100D	ALL	COMPONENT PROTECTION
PAG								-7		6 C	R_2_R_3_R

<u>CAG</u> wcr 9-2-89 2-12-93 wcg A7 9-25-59 22390 PREPARER/DATE JLH 9-8-86 ETD 9-10-86 CHECKED/DATE 1 . .







EQIS_NUMBER		  	IT.	DEVICE ID NO.		AZMITH	LOCATION- ELEV(1)	<u>RM⁄ RAD</u>	ĊĂĬ	OPER TIME	EVENI	SAFETY FUN	ICTION	
DESCRIPTION			<u> </u>	MODI	<u>EL NUM</u>	BER	CUNIKALI	<u> </u>	(2)					
WBN-1-JB -29 Junction Box	3-4332 -	E 1-	JB	-293-4332 JVB	-E	135	721' 3" VARIDUS	LC	B	100D	ALL	COMPONENT	PROTECTION	·
WBN-1-JB -29 Junction Box	3-4334 -	F 1-	JB	-293-4334 JVB	-F	224	723' 7" VARIOUS	LC	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -29 Junction Box	3-4336 -	F 1-	JB	-293-4336 JVB	-F	229	720' 8" Various	LC	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -29 Junction Box	3-4338 -	G 1-	JB	-293-4338 JVB	-G	333	720' 9" VARIOUS	LC	B	100D	ALL	COMPONENT	PROTECTION	
WBN-1-JB -29 Junction Box	3-4340 -	6 1-	JB	-293-4340 JVB	-G	315	717' 1" Various	LC	B	100D	ALL	COMPONENT	PROTECTION	

PAGE A -50 R3

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R<u>2</u> R<u>3</u> R PREPARER/DATE JLH CAG 9-20-89 WCG 9-25-89 9-8-86 WCN ung 9-10-86 ETD CHECKED/DATE_ 2.25.90







EQIS NUMB DESCRIPTI	ER		UNIT	DEVICE ID NO. MODEL	NUM	AZMITH_ BER	LOCATION- ELEV(1) CONTRACT	<u>RM/RAD</u>	<u>CAT</u> (2)	<u>OPER TIME</u>	EVENT	SAFETY FUNCTION	3
WBN-1-JB JUNCTION	-293-4342 BOX	-D.	1-JB	-293-4342 JVA	– D	030	720'10" Various	LC	B	100D	ALL	COMPONENT PROTECTION	<b>N</b>
WBN-1-JB Junction	-293-4344 BOX	- D	1-JB	-293-4344 JVA	- D	068	719' 7" Various	LC	В	100D	ALL	COMPONENT PROTECTION	<b>N</b> 1
WBN-1-JB JUNCTION	-293-4346 BOX	-D	1-JB	-293-4346 JVA	-D	148	720' 4" Various	LC	B	100D	ALL	COMPONENT PROTECTIO	N .
WBN-1-JB Junction	-293-4348 BOX	- D	1-JB	-293-4348 JVA	- D	117	719' 4" VARIOUS	LC	B	100D	ALL	COMPONENT PROTECTIO	<b>N</b>
WBN-1-JB JUNCTION	-293-4350 BOX	-E	1-JB	-293-4350 JVA	-E	185	716' 9" Various	LC	B	100D	ALL	COMPONENT PROTECTIO	)N

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R_2_ R_3___ CAG 9-70-59 27-90 WCG 47 9-25-89 2-23-90 PREPARER/DATE JLH 9-8-86 9-10-86 ETD CHECKED/DATE_







EQIS NUMBER DESCRIPTION		UNIT	DEVICE ID NO. MODEL	NUM	AZMITH. BER	LOCATION- ELEV(1) CONTRACT	<u>RM⁄RAD</u>	<u>CAI</u> (2)	<u>OPER TIME</u>	<u>event</u>	SAFETY_FUNCTION	
WBN-1-JB -293-43 Junction Box	352 -E	1-JB	-293-4352 JVA	-E	240	716' 4" Various	LC	B	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-43 Junction Box	354 -E	1-JB	-293-4354 JVA	-E	340	720' 9" Various	LC	<b>B</b>	100D	ALL	COMPONENT PROTECTION	
WBN-1-JB -293-4 JUNCTION BOX	35 <u>6</u> –E	1-JB	-293-4356 JVA	-E	300	716' 4" Varidus	LC	B.	100D	ALL	COMPONENT PROTECTION	

PAGE  $\mathcal{F}$ J 52 RJ

			R_2_	R <u>3</u>	R
PREPARER/DATE	JLH	9-8-86	CAG	wer	
CHECKED/DATE	ETD	9-10-86	4-20-89 wcg	AT	
			9-25-89	2,23.90	

BINDER NO. WBNEQ-JBOX-001 PLANT WBN UNIT(S) 1 SHEET B1 OF B11 R_1. R
BINDER TITLEJUNCTION BOXESCOMPUTEDJLHDATE $\frac{9/10/86}{4-2i+i}$
A. DOCUMENTATION
Equipment Description <u>Junction Boxes</u>
Vendor/Manufacturer <u>Various*</u>
Equipment Model No.(s) <u>See Binder TAB E for a list of mark</u>
numbers used at WBN
QUALIFICATION REPORTS
(1) Title/Number/Revision <u>Wyle Test Report</u> RIMS <u>B43 860514 501</u> No. 17733-1, RB, "Nuclear Environmental Qualification Test Program On Terminal Blocks & Cables for TVA" DATE 3/19/86
<pre>(2) Title/Number/Revision <u>Calc WBPEVAR8601003.RIMS B26 880527 030</u> R4 Watts Bar Plant Class 1E Junction Boxes and local instrument panel list (Harsh Environment) DATE <u>5/26/88</u> R1</pre>
OTHER (ANALYSIS, VENDOR DATA, ETC.)
*Comment - The Junction Boxes were purchased on various contracts. They are static, passive devices which only serve to provide a mounting location and a certain degree of protection for other components and devices, therefore contractural documentation is not included.

PAGE B-1 R1

PLUSEQ/135.25

				_ CHECKED_	ETD	$ = DATE \frac{9/15/86}{4-27-89} $	
A. <u>D</u>	)CUMENT/	ATION		<u> </u>			
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3	. Memor Watts Sign: (RIMS	fandum, M Bar Nuc Ificant C S No. B26	. L. Rayf lear Plan onditin R 860821 0	ield to P. t - Engine eport (SCI 05).	D. Met ering R ) WBNEQ	calf, August 21, 1986; Report (ER) for P 8632	
. 4	. Envi	ronmental	Dwgs 47E	235-41 R1	, -42 R2	2 & -76 R3.	
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IND	ER TITLE JUNCTION BOXES COMPUTED STA DATE 9/10/86 R R R
	CHECKED <u>Col DATE 1/1/0</u>
C.	QUALIFICATION CRITERIA
,	Criteria Used to Demonstrate Qualification is in Accordance with the Following (Indicate Which Criteria is Applicable):
	X Components are Qualified to the Criteria of 10CFR50.49 and/or NUREG-0588 Category I (IEEE323-1974)
	Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of 1E Bulletin No. 79- 01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)
	JUSTIFICATION/COMMENTS Criteria and requirements as set forth in
	10CFR50.49 and 10CFR50 App. A have been met through the box manu-
	facturer's adherence to recognized industry standards and this
	binder's utilization of qualification methods as outlined in
	<u>IEEE 323-1974.</u>
	INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET
	ANST/UL 50
	JIC EMP-1/EGP-1-1967
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BIND	ER NO. <u>WBNEQ-JBOX-001</u> PLANT <u>WBN</u> UNIT(S) <u>1</u> SHEET <u>B4</u> OFB1 <u></u> ER TITLE <u>JUNCTION BOXES</u> COMPUTED <u>JLH</u> DATE <u>5/15/86</u> <u>R</u> <u>R</u> <u>CHECKED</u> <u>ATE</u> <u>915/86</u> <u>CHECKED</u> <u>ATE</u> <u>915/86</u> <u>CHECKED</u> <u>STR</u>
D.	QUALIFICATION METHODOLOGY (Check only one block)
	Test of Identical Item Under Identical Conditions or Under Similar Conditions with Supporting Analysis
	Test of Similar Items with Supporting Analysis
	X Analysis in Combination with Partial Type Test Data that Supports the Analytical Assumptions and Conclusions
	Experience with Identical or Similar Equipment Under Similar Conditions with Supporting Analysis
	JUSTIFICATION/COMMENTS <u>IEEE 323-1974 states that: "Qualification</u>
	May Be Accomplished in Several Ways; Type Testing, Operating
	Experience, or Analysis." The method used for qualifying junction
	boxes at WBN relies heavily on analysis with some supporting type
	test data from qualification testing of other equipment housed in
	junction boxes during testing. See WYLE Laboratories Test Report
	17733-1 in TAB D, portions of which support the analysis presented
	in TAB C. TAB C presents a quantitative analysis (where pertinent)
	in addition to a qualitative analysis of the junction boxes which
	affirms that the performance/functional requirements of the junction
	<u>boxes (based on applicable industry standards - NEMA 250, ANSI/UL 50,</u>
	etc.) are met when the boxes are subjected to the WBN normal/acci-
	dent service conditions and accident environments. Full considera-
	tion of the time dependent effects of environmental influences was
	taken in establishing the qualified life of the WBN junction boxes.

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Ε.	EQUII	MENT DESCRIPTION	[	· · · · ·					
	Is th ident (Yes,	ne equipment iden tical to the plan (No/NA)?	tified in the quit of the quipment which	ualification do ch requires qua	cumentation Lification				
	- -	·	<u>Plant Device</u> Junction Boxes (Various Types	Qualification <u>Document</u> NEMA 12 Junction Box	<u>Referen</u> 17733-1 Section X				
	(1)	Equipment Type	and Sizes)	(12%"x10"x8")	<u>Fara 3.2.1</u>				
	(2)	Model Number(a)	Various	Various	N/Δ				
	(4)	Serial Number(s)			N/A				
•		·							
	<b>(5)</b>	Identify Compone Unique checkshee attached:	nt- <u>N/A</u>						
	The basic structure and function of								
	junction boxes are similar regardless of variations in size and								
	<u>NEMA</u>	types/features.	The type box u	sed in the WYLE	Laboratorie				
·	<u>Test</u>	<u>is representativ</u>	e of those boxe:	s used at WBN.					
	- <del></del>				•••				

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TNSTALLATION INTER	FACES		
		1	an of the
Does the qualifica equipment so that identical to the t	the installed design and est configuration (yes/no	configuration is NA)? (note belo	similar or w)
<u>Interface</u>	Identify Interface Requirement	Acceptable? (Yes/No/NA)	Reference <u>Test Report</u>
Mounting Bolts	<u> </u>		a
External	N/A		
Process Connections	1		
Electrical	<u>N/A</u>		
Connections			
Conduit Seals	<u> </u>		
Connector Seals	N/A		
Orientation	N/A	والمتعادية والمتكفر المتكون	
Physical	N/A		
Configuration	Internal Components		
Other	<u>See Comments</u>		
JUSTIFICATION/COMM	ENTS <u>Mounting of interna</u>	<u>l components is a</u>	ddressed in
the qualification	of terminal blocks, hands	witches, etc. Wh	ere placement
<u>orientation, etc.</u>	is important to qualifica	tion, it is addre	ssed for
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BINDER NO. WBNEQ-JBOX-001 PLANT WBN UNIT(S) 1 SHEET B7 OFB11 BINDER TITLE JUNCTION BOXES COMPUTED JLH DATE 5/15/86 R R R _____ CHECKED 577 DATE 5715/86_____ Sections G through M are omitted as not being applicable to this equipment. PAGE B-9 EQP065.25 TVA

	ER TITLE JUNCTION BOXES COMPUTED JLH DATE 5/15/86 19/19/ Hurse CHECKED ETD DATE 5/15/86 940 4/16-89
<b>N.</b>	MAINTENANCE AND SURVEILLANCE Has the qualification program identified those surveillance, maintenance, and inspection parameters which are essential to maintain qualification and which aid in detecting degrading material or equipment performance (Yes/No/NA)? Yes (Enter all requirements in Section G of the Binder - Qualification
	parameters are addressed in TAB G.
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BIND	ER TITLE JUNCTION BOXES COMPUTED JLH DA	те <u>5/15/86                                    </u>
0.	SUMMARY OF REVIEW	Yes/No/NA
·	(1) Documented evidence of qualification adequate (Have all assumptions, mathematical models, and all extrapolations of test data used in an analysis been justified and documented)?	<u>Yes</u>
	(2) Any exceptions (i.e., sound reasons to the contrar taken to the specified qualification level adequately justified?	y) <u>N/A</u>
	(3) Choice of qualification methodology adequately justified?	Yes
	(4) If analysis was performed, complete the following:	
	(a) Were equipment performance requirements identified?	Yes
	(b) Were specific features and failure modes and effects analyzed?	N/A
	(c) Were assumptions and mathematical models used together with appropriate justification for their use?	<u> </u>
	(d) Were environmental parameters which affect equipment performance identified?	Yes
	(5) Adequate similarity between equipment and test specimen established?	Yes
	(6) Aging degradation evaluated adequately?	Yes
	(a) Mechanical and/or cycle aging addressed?	<u>N/A</u>
	(b) Equipment aged to end of life condition prior application of DBE conditions?	to <u>N/A</u> .
	(c) Absence of preaging in test/analysis justified	1? <u>N/A</u>
	(d) Materials susceptible to thermal/radiation	Yes

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BINDER T	ITLE JUNCTION BOXES COMPUTED JLH DATE S	<u>//5/86</u> R
0. <u>sum</u>	MARY OF REVIEW (Continued)	Yes/No/NA
	(e) Normally operating state of device (e.g., normally energized) considered?	<u>N/A</u>
(7)	Qualified life or replacement schedule established?	Yes
(8)	Criteria regarding temperature/pressure exposure satisfied?	Yes
	(a) Peak temperature adequate	N/A
	(b) Peak pressure adequate	Yes
	(c) Duration adequate	Yes
	(d) Required profile enveloped adequately	Yes
	(e) Steam exposure adequate	<u>N/A</u>
(9)	Criteria regarding test sequence satisfied?	<u> </u>
(10)	Criteria regarding spray satisfied?	<u>N/A</u>
	(a) Was the spray testing done while under the extremes of pressure and temperature?	<u>N/A</u>
	(b) Does the spray concentration, flow rate, density, duration, and pH used in tests meet or exceed those to be used for the plant?	<u>N/A</u>
(11)	Criteria regarding submergence satisfied?	<u>N/A</u>
(12)	Criteria regarding radiation satisfied?	N/A
	(a) Was dose rate considered?	<u>N/A</u>
•	(b) Was beta radiation considered?	N/A
(13)	Criteria regarding operability status/mode satisfied?	Yes
(14)	Criteria regarding test failures or anomalies	<u>N/A</u>

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BIN	DER TITLE JUNCTION BOXES COMPUTED JLH DA	те <u><i>\$/!\$ !8</i>6"</u> "
	CHECKED ETR DA	TE <u>\$715786</u>
0.	<u>SUMMARY OF REVIEW</u> (Continued)	
		<u>Yes/No/NA</u>
	(15) Criteria regarding functional testing satisfied?	<u>N/A</u>
	(a) Does the test plan/report specify an acceptanc criteria for equipment performed?	e <u>N/A</u>
	(b) Was an initial base line test done to establis required performance characteristics?	sh <u>N/A</u>
	(c) Has the test/analysis demonstrated that performance specifications and characteristi (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	mance <u>N/A</u> cs
• .	(16) Criteria regarding instrument accuracy satisfied?	<u>N/A</u>
	(17) Test duration margin (1 hour + function time) satisfied?	<u>N/A</u>
	(a) Is the minimum specified operating time at lea 1 hour?	ast <u>N/A</u>
	(b) If exception to the l-hour minimum operating t was taken, was adequate justification provid	ime <u>N/A</u> led?
	(18) Criteria regarding synergistic effects satisfied?	<u>N/A</u>
	(19) Criteria regarding margins satisfied?	<u> </u>
	(20) Maintenance and surveillance requirements adequate identified?	ely <u>Yes</u>
<b>P</b> .,	DISCUSSION	
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